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SECTION 00 52 00

COUNTY OF YOLO, CALIFORNIA

CONSTRUCTION AGREEMENT FOR
Yolo County Ag Department Shops Building

120 West Main Street Woodland, CA 95695 right outside of Ste. C

CONTRACT NO. _____

This Agreement for Construction ("Agreement" or "Contract") is between Creekside Commercial Builders, Inc., a California corporation ("Contractor"), and the County of Yolo ("County"), a political subdivision of the State of California.

1. SCOPE OF WORK. Contractor shall furnish all labor, services, transportation, materials, equipment, parts, and supplies necessary for the **Yolo County Ag Department Shops Building ("the Project")** in strict accordance with the Project plans and specifications and Contract Documents. Contractor shall complete the Project per the Bid Schedule, not to exceed three million eight hundred ninety eight thousand seven hundred and thirty four dollars 00/100 $3,898,734.00 ("Contract Price").

2. CONTRACT DOCUMENTS. The following documents defined as the "Contract Documents" in Section 1.12 of the General Conditions, are incorporated as if fully set forth herein by this reference and comprise the entire Agreement between the County and Contractor concerning the Project.

Proposal Response, including all required forms
Subcontractor List
Project Manual, Vol. I, Bidding and Contracting Requirements
Project Manual, Vol. II, Technical Specifications and Drawings
Project Manual, Vol. 3: Yolo County Ag Department Shops Building Plans dated December 9, 2022, December 12, 2023, and updates through 7/29/2024
Project Manual, Vol. 4: Civil Off-site Plans dated January 4, 2024
Supplemental Documents: Structural Calculation dated September 2024, Drainage Study dated January 8, 2024; and City of Woodland Encroachment Permit Application
Performance Bond and Payment Bond
General Conditions
Notice to Bidders
Notice to Proceed
Project Plans and Specifications
Addenda
Change Orders Issued by the County

All of the Contract Documents are intended to be complementary. Work required by one of the Contract Documents and not by others shall be done as if required by all. In the event of a conflict, the various Contract Documents will be given effect in the order set forth in the General Conditions (Sections 4.02 and 20.08). In the event of any remaining conflict, the provision that requires the highest level of performance from Contractor for the County's benefit shall prevail.

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3. CONDUCT OF WORK, CONTRACT ADMINISTRATOR. Contractor shall perform the services described in the Contract Documents in a in a good, workmanlike and substantial manner and to the satisfaction of the County and in a manner that causes the least possible inconvenience to County and the public and safeguards persons and property from any dangerous activities or conditions conducted or created by Contractor. County's Chief Deputy County Administration Officer shall administer this Agreement for County. County's Board of Supervisors may designate a different person to serve as Contract Administrator by giving advance written notice to Contractor.

(a) Work Schedule. Unless otherwise agreed pursuant to Section 3.01 of the General Conditions, Contractor shall begin work within ten (10) calendar days after receiving the Contract Administrator's Notice to Proceed and shall complete the work within **548 calendar days** after receiving that notice, followed by a 90 day maintenance period This work must be complete, operational, and be accepted by the County for its intended use for this milestone to be deemed complete.

(b) Liquidated Damages. Contractor shall pay County $400.00 a day liquidated damages for each day's delay (excluding Saturdays, Sundays, and County observed holidays) in completing the work beyond the time specified for completion of work. All other aspects of the payment of such damages shall be governed by Section 3.12 of the General Conditions and other relevant provisions thereof. The assessment of liquidated damages is not a penalty but considered to be a reasonable estimate of the amount of damages County will suffer by delay in completion of the Project. The County is entitled to set off the amount of liquidated damages assessed against any payments otherwise due to Contractor, including, but not limited to, setoff against release of retention. If the total amount of liquidated damages assessed exceeds the amount of unreleased retention, County is entitled to recover the balance from Contractor or its sureties. Use of the Project in whole or in part prior to substantial completion, shall not operate as a waiver of County's right to assess liquidated damages.

4. INDEMNIFICATION. With the exception that this section shall in no event be construed to require indemnification by Contractor to a greater extent than permitted under the public policy of the State of California, Contractor shall provide indemnification and defense of the County as set forth in the General Conditions (see sections 2.05 and 2.06 of the General Conditions) and Section 00 62 10 of the Project Manual.

Responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnification obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement. In providing any defense under the Contract Documents, Contractor shall use counsel reasonably acceptable to the County.

5. COMPENSATION; PREVAILING WAGE. The County shall pay to the Contractor as full compensation for the performance of this Agreement the Contract Price, subject to any additions or deductions as provided in the Contract Documents. All matters of compensation and payment shall be governed by the General Conditions, including but not limited to Article 25 thereof, provided, however that the total compensation to be paid by County to Contractor shall not

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exceed the Contract Price. The statement of prevailing wages appearing in the General Prevailing Wage Rate Determinations of the Director of the State of California Department of Industrial Relations are incorporated herein by reference. When two rates differ for similar kinds of labor, Contractor shall pay not less than the higher rate. Contractor shall bear all risks of payment or non-payment of prevailing wages under California law, and Contractor hereby agrees to defend, indemnify, and hold the County, its officials, officers, employees, agents and volunteers, free and harmless from any claim or liability arising out of any failure or alleged failure to comply with the prevailing wage laws.

6. INSURANCE. Contractor shall maintain the insurance required by the General Conditions and the following insurance while performing the work covered by this Agreement. The comprehensive general liability insurance shall include broad form property damage insurance.

(a) Minimum Coverages (as applicable) - Insurance coverage shall be with limits not less than the following:

1. **Commercial General Liability** Occurrence form Insurance policy (ISO CG 00 01 or equivalent) covering all operations by or on behalf of Contractor, including coverage for:

   a) Premises and Operations

   b) Products and completed Operations

   c) Contractual Liability insuring the obligations assumed by Contractor in this agreement or Blanket Contractual Liability Coverage

   d) Broad Form Property Damage (including Completed Operations)

   e) Explosion, Collapse, and Underground Hazards

   f) Personal Injury Liability

   Limits of liability shall be not less than:

   $5,000,000 each occurrence (combined single limit for bodily injury and property damage)

   $5,000,000 for Personal Injury Liability

   $5,000,000 for Products Completed Operations

   $10,000,000 General Aggregate

   If the policy does not have an endorsement providing that the General Aggregate Limit applies separately, or if defense costs are included in the aggregate limits, then the required aggregate limits shall be $10,000,000.

2. **Automobile Liability** – Insurance policy (ISO CA 00 01) covering Bodily Injury, Property Damage and contractual Liability coverage for "Any Auto" which includes coverage for any owned, hired, borrowed and non-owned automobile, trailer, and equipment coverage, with limits no less than $1,000,000 occurrence (per accident for bodily injury and property damage) and $2,000,000 policy aggregate.

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3. **Workers' Compensation** – Statutory Limits/**Employers' Liability** – No less than $1,000,000 per accident for bodily injury or disease.

4. **Builder's Risk** – (Course of Construction) insurance utilizing an "All Risk" (Special Perils) coverage form, with limits equal to the completed value of the project and no coinsurance penalty provisions.

5. **Contractor's Pollution Legal Liability Insurance** – Limits of no less than $2,000,000 per occurrence or claim, and $2,000,000 policy aggregate.

(b) The County, its officers, agents, employees and volunteers shall be named as additional insured on all but the workers' compensation and professional liability coverages. **[NOTE: Evidence of additional insured may be needed as a separate endorsement due to wording on the certificate negating any additional writing in the description box.]** It shall be a requirement under this agreement that any available insurance proceeds broader than or in excess of the specified minimum Insurance coverage requirements and/or limits shall be available to the Additional Insured. Furthermore, the requirements for coverage and limits shall be (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any Insurance policy or proceeds available to the named Insured; whichever is greater.

1. The Additional Insured coverage under the Contractor's policy shall be "primary and non-contributory" and will not seek contribution from the County's insurance or self-insurance and shall be at least as broad as CG 20 01 04 13.

2. The limits of Insurance required in this agreement may be satisfied by a combination of primary and umbrella or excess Insurance. Any umbrella or excess Insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and non-contributory basis for the benefit of the County of Yolo (if agreed to in a written contract or agreement) before the County's own Insurance or self-insurance shall be called upon to protect it as a named insured.

3. Said policies shall remain in force through the life of this Agreement and, with the exception of professional liability coverage, shall be payable on a "per occurrence" basis unless the County Risk Manager specifically consents in writing to a "claims made" basis. For all "claims made" coverage, in the event that the Contractor changes insurance carriers Contractor shall purchase "tail" coverage covering the term of this Agreement and not less than three years thereafter. Proof of such "tail" coverage shall be required at any time that the Contractor changes to a new carrier prior to receipt of any payments due.

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4. The Contractor shall declare all aggregate limits on the coverage before commencing performance of this Agreement, and the County's Risk Manager reserves the right to require higher aggregate limits to ensure that the coverage limits required for this Agreement as set forth above are available throughout the performance of this Agreement.

5. Any deductibles or self-insured retentions must be declared to and are subject to the approval of the County Risk Manager. All self-insured retentions (SIR) must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied either by the named Insured or Yolo County.

6. Each insurance policy shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the Director (ten (10) days for delinquent insurance premium payments).

7. Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII, unless otherwise approved by the County Risk Manager.

8. The policies shall cover all activities of Contractor, its officers, employees, agents and volunteers arising out of or in connection with this Agreement.

9. For any claims relating to this Agreement, the Contractor's insurance coverage shall be primary, including as respects the County, its officers, agents, employees and volunteers. Any maintained by the County shall apply in excess of, and not contribute with, insurance provided by Contractor's liability insurance policy.

10. The insurer shall waive all rights of subrogation against the County, its officers, employees, agents and volunteers.

(c) Prior to commencing services pursuant to this Agreement, Contractor shall furnish the County with original endorsements reflecting coverage required by this Agreement. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. All endorsements are to be received by, and are subject to the approval of, the County Risk Manager before work commences. Upon County's request, Contractor shall provide complete, certified copies of all required insurance policies, including endorsements reflecting the coverage required by these specifications.

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(d) During the term of this Agreement, Contractor shall furnish the County with original endorsements reflecting renewals, changes in insurance companies and any other documents reflecting the maintenance of the required coverage throughout the entire term of this Agreement. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. Upon County's request, Contractor shall provide complete, certified copies of all required insurance policies, including endorsements reflecting the coverage required by these specifications. Yolo County reserves the right to obtain a full certified copy of any Insurance policy and endorsements. Failure to exercise this right shall not constitute a waiver of right to exercise later.

(e) Contractor agrees to include with all Subcontractors in their subcontract the same requirements and provisions of this agreement including the indemnity and Insurance requirements to the extent they apply to the scope of the Subcontractor's work. Subcontracts in excess of one million dollars shall comply with the same insurance requirements as the general contractor. Adjustments will be considered by the County based upon the subcontractors scope of work for amounts under one million dollars. Subcontractors hired by Contractor agree to be bound to Contractor and the County of Yolo in the same manner and to the same extent as Contractor is bound to the County of Yolo under the Contract Documents. Subcontractor further agrees to include these same provisions with any Sub-subcontractor. A copy of the Owner Contract Document Indemnity and Insurance provisions will be furnished to the Subcontractor upon request. Contractor shall require all Subcontractors to provide a valid certificate of insurance and the required endorsements included in the agreement prior to commencement of any work and Contractor will provide proof of compliance to the County of Yolo.

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(f) Contractor shall maintain insurance as required by this contract to the fullest amount allowed by law and shall maintain insurance for a minimum of five years following the completion of this project. In the event Contractor fails to obtain or maintain completed operations coverage as required by this agreement, the County at its sole discretion may purchase the coverage required and the cost will be paid by Contractor.

7. COMPLIANCE WITH LAWS.

(a) Contractor shall comply with all relevant federal, state, and local statutes, regulations, ordinances, rules, orders, and other laws in effect when performing the services required by this Agreement, all as set forth in the General Conditions (including but not limited to Article 20 thereof), and including, but not limited to, the provisions of the California Labor Code and California Public Contract Code that are applicable to this Project.

(b) By its signature hereunder, Contractor further certifies that it is aware of the provisions of Section 3700 of the Labor Code et seq. which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and Contractor will comply with such provisions before commencing the performance of the work of this contract.

(c) Contractor further represents and warrants that it is eligible to work on the Project pursuant to Labor Code Sections 1777.1 and 1777.7 and other applicable provisions of law. Further, Contractor acknowledges that it is prohibited from performing work on the Project with a subcontractor who is ineligible to perform work on public works project pursuant to Labor Code Sections 1777.1 and 1777.7.

8. INDEPENDENT CONTRACTOR. While performing the services required by this Agreement for Construction, Contractor shall act as an independent contractor, not as an employee of County, and thus shall be subject to the direction and control of County only for the final result. Contractor shall be solely responsible for paying all required employment taxes and for meeting all employment obligations related to its performance of the services, including but not limited to payment of worker's compensation, liability insurance, social security taxes (i.e., FICA), and tax withholding. Moreover, Contractor shall indemnify, defend (upon County's written request), and protect County from any liability County may incur to federal or state governments for such taxes and obligations. This Agreement does not entitle Contractor or its officers, employees, subcontractors, or agents to vacation pay, sick leave, retirement benefits, disability or unemployment insurance, or employee benefits of any kind from County.

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9. INSPECTIONS. All inspections and any remedial action required in response thereto shall be governed by the General Conditions, including but not limited to Article 18 thereof.

10. PERFORMANCE AND PAYMENT BONDS. Within the time set forth in the Proposal and before performing any services pursuant to this Agreement, Contractor shall provide to County the bonds required by the General Conditions, including but not limited to Article 2 thereof. All other matters relating to bonds shall be governed by the General Conditions.

11. TERM OF AGREEMENT; EARLY TERMINATION. The term and termination of this Agreement shall be governed by the General Conditions, including but not limited to Article 27 thereof.

12. GUARANTY. Guarantees and warranties shall be governed by the General Conditions, including but not limited to Article 26 thereof.

13. AUDIT PROVISIONS. Contractor's records which shall include but not limited to accounting records, subcontract files, correspondence, change order files, and any other supporting evidence necessary to substantiate charges relating to this contact (all the foregoing hereinafter referred to as "records") shall be open to inspection and subject to audit and/or reproduction, during normal working hours, by County's agent or its authorized representative to the extent necessary to adequately permit evaluation and verification of any invoices, payments, or claims submitted by the contractor or any of his payees pursuant to the execution of this Agreement. For the purpose of such audits, inspections, examination, and evaluations, the County's agent or authorized representative shall have access to said records from the effective date of this Agreement, for the duration of the work, and until six years after the date of final payment by County to Contractor pursuant to this Agreement.

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14. PROCEDURE FOR RESOLVING CLAIMS.

Contractor shall timely comply with any and all requirement of the Contract Documents pertaining to notices and requests for changes to the Contract Time or Contract Price as a prerequisite to filing any claim governed by this Section. The failure to timely submit a notice of delay or notice of change, or to timely request a change to the time for completion or Contractor's compensation, or to timely provide any other notice or request required herein shall constitute a waiver of the right to further pursue the claim under the Contract or at law. This claim resolution procedure shall control over any conflicting claim or dispute resolution procedure in the Contract Documents.

(a) Intent. Effective January 1, 1991, Section 20104 et seq., of the California Public Contract Code prescribes a process utilizing informal conferences, non-binding judicial supervised mediation, and judicial arbitration to resolve disputes on construction claims of $375,000 or less. Effective January 1, 2017, Section 9204 of the Public Contract Code prescribes a process for negotiation and mediation to resolve disputes on construction claims. The intent of this Section is to implement Sections 20104 et seq. and Section 9204 of the California Public Contract Code. This Section shall be construed to be consistent with all applicable law, including but not limited to these statutes.

(b) Claims. For purposes of this Section, "Claim" means a separate demand by the Contractor for:

i. An adjustment to the time for completion including, without limitation, for relief from damages or penalties for delay assessed by the County;
ii. Payment by the County of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract, payment for which is not otherwise expressly provided or to which the Contractor is not otherwise entitled; or
iii. An amount the payment of which is disputed by the County.

A "Claim" does not include any demand for payment for which the CONTRACTOR has failed to provide notice, request a Contract Change Order, or otherwise failed to follow any procedures contained in the Contract Documents.

(c) Filing Claims. Claims governed by this Section may not be filed unless and until the Contractor completes any and all requirements of the Contract Documents pertaining to notices and requests for changes to the Contract Price or Contract Time, and Contractor's request for a change has been denied in whole or in part. Claims governed by this Section must be filed no later than fourteen (14) days after a request for change has been denied in whole or in part or after any other event giving rise to the Claim. The Claim shall be submitted in writing to the County and shall include on its first page the following words in

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16 point capital font: "THIS IS A CLAIM." The Claim shall include all information and documents necessary to substantiate the Claim, including but not limited to those identified below. Nothing in this Section is intended to extend the time limit or supersede notice requirements otherwise provided by Contract Documents. Failure to follow such contractual requirements shall bar any Claims or subsequent proceedings for compensation or payment thereon.

(d) Documentation. The Contractor shall submit all Claims in the following format:

i. Summary description of Claim including basis of entitlement, merit and amount of time or money requested, with specific reference to the Contract Documents provisions pursuant to which the Claim is made

ii. List of documents relating to Claim:
    i. Specifications
    ii. Drawings
    iii. Clarifications (Requests for Information)
    iv. Schedules
    v. Other

iii. Chronology of events and correspondence

iv. Narrative analysis of Claim merit

v. Analysis of Claim cost, including calculations and supporting documents

vi. Time impact analysis in the form required by the Contract Documents, if the Contract Documents do not require a particular format, CPM format, if an adjustment of the Contract Time is requested.

(e) County's Response. Upon receipt of a Claim pursuant to this Section, the County shall conduct a reasonable review of the Claim and, within a period not to exceed forty-five (45) days, shall provide the Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed. Any payment due on an undisputed portion of the Claim will be processed and made within sixty (60) days after the County issues its written statement.

i. If the County needs approval from its governing body to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the Claim, and the County's governing body does not meet within the forty-five (45) days or within the mutually agreed to extension of time following receipt of a Claim sent by registered mail or certified mail, return receipt requested, the County shall have up to three (3) days following the next duly publicly noticed meeting of the County's governing body after the forty-five (45) day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.

ii. Within thirty (30) days of receipt of a Claim, the County may request in writing additional documentation supporting the Claim or relating to defenses or Claims the County may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual

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agreement of the County and the Contractor. The County's written response to the Claim, as further documented, shall be submitted to the Contractor within thirty (30) days (if the Claim is less than $50,000, within fifteen (15) days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

(f) Meet and Confer. If the Contractor disputes the County's written response, or the County fails to respond within the time prescribed, the Contractor may so notify the County, in writing, either within fifteen (15) DAYS of receipt of the County's response or within fifteen (15) days of the County's failure to respond within the time prescribed, respectively, and demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand, the County shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

(g) Mediation. Within ten (10) business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the County shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the County issues its written statement. Any disputed portion of the Claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the County and the Contractor sharing the associated costs equally. The County and Contractor shall mutually agree to a mediator within ten (10) business days after the disputed portion of the Claim has been identified in writing, unless the parties agree to select a mediator at a later time.

i. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

ii. For purposes of this Section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this Section.

iii. Unless otherwise agreed to by the County and the Contractor in writing, the mediation conducted pursuant to this Section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

iv. The mediation shall be held no earlier than the date the Contractor completes the Work or the date that the Contractor last performs Work, whichever is earlier. All unresolved Claims shall be considered jointly in a single mediation, unless a new unrelated Claim arises after mediation is completed.

(h) Procedures After Mediation. If following the mediation, the Claim or any portion remains in dispute, the Contractor must file a Claim pursuant to Chapter 1 (commencing with

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Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code prior to initiating litigation. For purposes of those provisions, the running of the period of time within which a Claim must be filed shall be tolled from the time the Contractor submits his or her written Claim pursuant to subdivision (a) until the time the Claim is denied, including any period of time utilized by the meet and confer conference.

(i) Civil Actions. The following procedures are established for all civil actions filed to resolve Claims of $375,000 or less:

i. Within sixty (60) days, but no earlier than thirty (30) days, following the filing or responsive pleadings, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties or unless mediation was held prior to commencement of the action in accordance with Public Contract Code section 9204 and the terms of this Contract. The mediation process shall provide for the selection within fifteen (15) days by both parties of a disinterested third person as mediator, shall be commenced within thirty (30) days of the submittal, and shall be concluded within fifteen (15) days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court.

ii. If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1114.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration. In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, (A) arbitrators shall, when possible, be experienced in construction law, and (B) any party appealing an arbitration award who does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, also pay the attorney's fees on appeal of the other party.

(j) Government Code Claim Procedures.

i. This Section does not apply to tort claims and nothing in this Section is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commending with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.5 of Title 1 of the Government Code.

ii. In addition to any and all requirements of the C pertaining to Contract Documents notices of and requests for adjustment to the Contract Time, Contract Price, or compensation or payment for extra work, disputed Work, construction claims and/or changed conditions, the Contractor must comply with the claim procedures set forth in Government Code Section 900, et seq. prior to filing any lawsuit against the County.

iii. Such Government Code claims and any subsequent lawsuit based upon the Government Code claims shall be limited to those matters that remain unresolved

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after all procedures pertaining to adjustment of the Contract Time or Contract Work for extra work, disputed work, construction claims, and/or changed conditions have been followed by Contractor. If Contractor does not comply with the Government Code claim procedure or the prerequisite contractual requirements, Contractor may not file any action against the County.

iv. **A Government Code claim must be filed no earlier than the date the Work is completed or the date the Contractor last performs Work on the Project, whichever occurs first. A Government Code claim shall be inclusive of all unresolved claims known to Contractor or that should reasonably by known to Contractor excepting only new unrelated Claims that arise after the Government Code claim is submitted.**

(k) Non-Waiver. The County's failure to respond to a Claim from the Contractor within the time periods described in this Section or to otherwise meet the time requirements of this Section shall result in the Claim being deemed rejected in its entirety and shall not constitute a waiver of any rights under this Section.

15. MISCELLANEOUS.

(a) Notice. Except as provided in Section 6, all correspondence regarding this Agreement, including invoices, payments, and notices, shall be directed to the following persons at the following addresses and phone number:

County:
Director, Yolo County General Services Department
Ryan Pistochini, Director
120 West Main Street, Ste C
Woodland, CA 95695
Telephone: (530) 406-8005

Contractor:
Creekside Commercial Builders, Inc.
David Sosner, President
3131 Peacekeeper Way Ste 400
McClellan, CA 95652
Telephone: (916) 783-8080

If written, correspondence shall be sent by personal delivery (including overnight delivery service); by U.S. Mail, postage prepaid; or by fax during business hours. Notices must be actually received to be effective.

(b) Time of Essence. Time is of the essence of this Agreement.

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(c) Interpretation and Jurisdiction. This Agreement shall be interpreted and applied in accordance with California law. In the event of a dispute between the parties as to the language of this Contract or the construction or meaning of any term hereof, this Contract shall be deemed to have been drafted by the parties in equal parts so that no presumptions or inferences concerning its terms or interpretation may be construed against any party to this Contract. Any action or proceeding arising out of this Contract shall be filed in a California Superior Court located in Woodland, California.

(d) Waiver. A party's failure to insist on strict performance of this Agreement or to exercise any right or remedy upon breach of this Agreement shall not constitute a waiver of such performance, right, or remedy. No waiver is binding unless set forth in a writing signed by the waiving party.

(e) Assignments and Subcontracts. Contractor shall not assign this Agreement. Contractor may subcontract any of the services described in Section 1 (Scope of Work) with County's prior written consent. Contractor shall require each subcontractor to agree in writing to be bound by Section 4 (Indemnification) and Section 6 (Insurance) of this Agreement. County shall consider all subcontractors to be Contractor's employees, and Contractor shall be responsible for their work.

(f) Integration. This Agreement sets forth the parties' entire understanding regarding the matters set forth in herein. It supersedes all prior Agreements and representations, written and oral, and may be modified only by a written amendment approved by County's Chief Deputy County Administration Officer and signed by County and Contractor.

(h) Effective date. This Agreement shall be effective on the last date shown below.

(i) Public Record. Upon its execution, this Agreement (including all exhibits and attachments) shall be subject to disclosure pursuant to the California Public Records Act.

[*Signatures on Following Page*]

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IN WITNESS WHEREOF, the parties have executed this Contract as of the date set forth above.

COUNTY OF YOLO:

By: _____

Ryan Pistochini
Director of General Services

CONTRACTOR:

Signed by:
By: David Sosner _____
F4FB2775DACE4DE...
(Signature)

David Sosner President
(Print Name & Title)

1/10/2025
(Date)

APPROVED AS TO FORM
Philip J. Pogledich, County Counsel

Signed by:
By Kimberly Hood _____
8F28F402B2A2431...
Kimberly Hood, Chief Asst. County Counsel

SECTION 00 44 00

BIDDER INFORMATION SHEET

The Bidder must check one of the following classifications that fit its type of business organization and furnish all information required under that classification.

Please type or print your answers.
Attach a copy of license(s) upon which you intend to rely.

(X) BIDDER IS A CORPORATION

The full name of the corporation as it appears on the State Contractor's License is:

Creekside Commercial Builders, Inc

Corporation is incorporated in the State of:

( ) BIDDER IS AN INDIVIDUAL

Bidder's name as it appears on State Contractor's License is:

( ) BIDDER IS A PARTNERSHIP

Bidder's firm name, individual or partnership, as it appears on State Contractor's License is:

The full names of all partners as they appear on State Contractor's License are:

County in which any Certificate of Doing Business Under Fictitious Name is filed – (If none, so state):

Accompanying this proposal is Bidders Bond (NOTICE: INSERT THE WORDS "CASH ($_____)", "CASHIER'S CHECK", "CERTIFIED CHECK", OR "BIDDER'S BOND", AS THE CASE MAY BE) in amount equal to at least ten (10) percent of the total of the Bid.

The names of all persons interested in the forgoing proposal as principals are as follows:

IMPORTANT NOTICE: If the Bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and executive officer thereof; if a partnership, state name of partnership, also names of all individual partners; if Bidder or other interested person is an individual, state first and last names in full.

Creekside Commercial Builders, Inc.

David Sosner, President, Elizabeth Sosner, Secretary

Licensed in accordance with an act providing for the registration of contractors,

License No. 925942 Classifications(s) A&B

(A copy of the afore-referenced license must be supplied at Notice of Award.)

ADDENDA: This Proposal is submitted with respect to the changes to the Contract included in addenda number/s 1,2,3,4

(Fill in addenda numbers if addendas have been received and insert, in this proposal, any Engineer's Estimate sheets that were received as part of the addenda)

CERTIFICATION OF BIDDER FOR PROPOSAL:

By my signature on this Proposal I certify, under penalty of perjury under the laws of the State of California, that the foregoing questionnaire and statements of Public Contract Code are true and correct. By my signature on this proposal I further certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Non-collusion Declaration required by Public Contract Code Section 7106 and Part 24 Debarment and Suspension Certification are true and correct.

The person or persons executing this proposal on behalf of a corporation or a member of partnership, shall be prepared to demonstrate by resolution, article, or otherwise, that such person is or that such persons are appropriately authorized to act in these regards for such corporation or partnership. Such authority shall be demonstrated to the satisfaction of the County of Yolo.

If the signature is by an agent other than an officer of a corporation or a member of a partnership, a power of attorney authorizing said act by the agent on behalf of his principal shall be submitted with the bid forms, otherwise the Bid may be disregarded as irregular and unauthorized.

The Bidder's execution on the signature portion of this Proposal shall constitute an endorsement and execution of those affidavits, declarations and certifications which are of this Proposal.

~~Executed~~ this 24th day of October, 2024 at McClellan, California.

Sign Here: _____

by

David Sosner, President

Name and Title of Bidder

SECTION 00 45 00

LIST OF SUCCESSFUL PROJECTS

Bidders must have experience in new construction and bidders must list below a minimum of five similar projects of not less than 50% of the total work scope of this project and within the last eight years.

Bidder name: Creekside Commercial Builders, Inc

	Project Location	Project Description	Contract Dollar Amount	Name and Phone # of Owner's Representative
1	Norwood JR High School Sacramento, Ca	"The project consists of an addition to an existing cafeteria building at Norwood Junior High School. This includes demolition of an existing shade structure, site preparation, a new foundation, a seismically separated steel-framed structure, and improvements to site concrete and landscaping. This is an active school site during construction and is DSA approved. "	$5,122,517	Twin Rivers Unified School District Greystone West : Construction Manager Lucas Vaughn 916-747-2495
2	Barrett Terrace, Richmond, Ca	"This project included the rehab of 115 (Total 103,701 SF) affordable units originally built in 1973. The 5.8 Acre site offers multiple play areas, a community building, and a laundry facility. The scope per-apartment differed, but largely encompassed a complete overhaul of each units interior finishes, and a mechanical systems. Exterior work includes fixing plumbing throughout the site, replacing site amenities, repairing waterproofing systems, balconies, stairs, treads, and risers, and the replacement of much of the landscaping. All scope took place in phases to limit the amount of displacement to tenants. "	$26,588,565	CHDC, Mike Rogers, 510-412-9290
3	Main Street Plaza, Roseville, Ca	"This is a new construction, four-story mixed use project consisting of 65 units split between two buildings. This multi-family affordable housing project includes nearly 3,000 square foot of ground floor community serving retail with tuck under parking. Amenities include on-site property management, laundry rooms, private balconies, and a landscaped private internal courtyard for the residents."	$22,022,657	Meta Housing Corp, Loren Messeri, 310-575-3543
4	One Lake Family Apartments, Fairfield, Ca	"This project consisted of one new wood- framed four-story residential building located on a 5.6-acre site with surface parking. This multi-family affordable housing projected contained 190 apartment units, teen and social rooms, and two interior courtyard that contain a single-story community building and common use amenities. "TCAC PROJECT""	$ 48,129,555	META Housing Corp., Alvaro Gonzalez, 323-823-1049
5	Dixon High School AG Facility Phase 2, Dixon, Ca	"Interior and exterior improvements at existing storage building to include two toilet rooms, handwashing stations, eyewash, custodial support space, and electrical power distribution. Interior improvements at existing barn to include a handwashing area, drinking fountain, and water distributions for care of animals."	$ 410,658	Dixon Unified School District, Cathy Allen 916-737-6085

SECTION 00 45 10

NON-COLLUSION DECLARATION

Non-Collusion Declaration To Be Executed By Bidder and Submitted with Bid
(Public Contract Code Section 7106)

State of California)
) ss.
County of Yolo)

The undersigned declares:

I am the President of Creekside Commercial Builders, Inc., the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on October 24,2024 [date], at McClellan [city], California [state].

Name ~~of Bidder~~ Creekside Commercial Builders, Inc

Signature

Name and Title David Sosner, President

Dated October 24, 2024

Note: Bidders are cautioned that making a false certification may subject the bidder to criminal prosecution

SECTION 00 45 26

JOINT APPRENTICESHIP COMMITTEE PARTICIPATION CERTIFICATION

The County has adopted a Joint Apprenticeship Committee (JAC) participation requirement for certain public projects estimated to cost more than one-million dollars ($1,000,000). A JAC means an apprenticeship program comprised of an equal number of employer and employee representatives approved by the State of California Division of Apprenticeship Standards. This JAC requirement is in addition to the apprenticeship requirements of the Prevailing Wage Laws.

To satisfy the County's JAC participation requirement, Contractors must submit evidence satisfactory to the Procurement Manager or the Procurement Manager's designee that they participate in a JAC by being a signatory to a JAC or employ registered apprentices dispatched by a JAC. Such evidence may be in the form of a signed letter from a JAC confirming the Contractor is a signatory to a JAC or has hired registered apprentices who are active participants of a JAC.

By signing below, Contractor acknowledges the County's JAC participation requirement and certifies that it satisfies this requirement. Failure to submit this form and attach evidence of compliance with this requirement shall result in a determination that the bid is non-responsive.

Name of Contractor Submitting Bid: Creekside Commercial Builders, Inc

Signature: _____

Name and Title: David Sosner, President

Date: October 24, 2024

Occupation(s)/Trade(s)/Craft(s):

Operators, Engineer Operators

Name of JAC: Apprenticeship of the Operating Engineers #3

Include Attachment – JAC Letter or other evidence of JAC participation

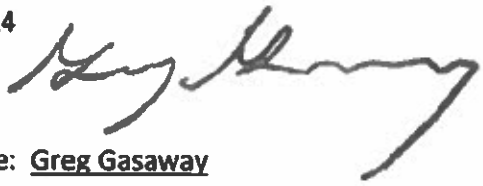
CERTIFIED STATEMENT OF HIRING

I am the Director of Apprenticeship of the Operating Engineers #3, JATC Program and I am authorized to make this Certified Statement on the Program's behalf.

I have examined the Program records which show that CREEKSIDE has hired apprentices from the Program.

The Program is approved by the State of California Department of Industrial Relations, Division of Apprenticeship Standards and has graduated approximately 91 apprentices per year averaging 55%.

10/08/2024

Name: 

Print Name: Greg Gasaway

SECTION 00 45 27

STATEMENT RE NO APPRENTICESHIP VIOLATION

I am the President of Creekside Commercial Builders, Inc
[Title] [Contractor]
and I am authorized to make this statement on Contractor's behalf.

During the past three (3) years, Contractor has not been found in violation of any provision of State or local apprenticeship laws or regulations.

Signature: _____

Printed Name: David Sosner

Date: October 24, 2024

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 00 45 28

ACKNOWLEDGMENT RE: HEALTH CARE EXPENDITURE REQUIREMENT

As set forth in the County's Policy on Procurement, the County has adopted the following requirement regarding Health Care Expenditures for certain public projects estimated to cost more than one million dollars ($1,000,000):

> Each Contractor with construction craft employees shall make health care expenditures for each such employee in an amount per hour worked on the Covered Project equivalent to at least the hourly pro rata cost of a Covered California Platinum level plan for two 40-year-old adults and two dependents 0 to 14 years of age for the Covered California rating area in which the development is located. Qualifying expenditures shall be credited toward compliance with prevailing wage payment requirements up to the amount determined by the Director of Industrial Relations pursuant to Sections 1773 and 1773.9 of the Labor Code. Health care expenditures in excess of that amount shall not be so credited. "Health care expenditures" include contributions under Sections 501(c) or (d) or 401(a) of the Internal Revenue Code and payments toward "medical care" as defined under Section 213(d)(1) of the Internal Revenue Code. A Contractor that is signatory to a valid collective bargaining agreement that requires payment of at least the prevailing wage, participation in a joint labor-management apprenticeship program, and the provision of health care payments for all construction craft employees shall be deemed in compliance. A Contractor without construction craft employees shall show a contractual obligation that its subcontractors comply with this paragraph.

The Project is a "Covered Project" and subject to this health care expenditure requirement.

By signing below, Contractor acknowledges that Contractor has read and will comply with this health care expenditure requirement or, alternatively, that Contractor is a signatory to a valid collective bargaining agreement, which requires payment of at least the prevailing wage, participation in join labor-management apprenticeship program, and the provision of health care payments for all construction craft employees.

Failure to submit this acknowledgment form shall result in a determination that the bid is non-responsive.

Name of Contractor Submitting Bid: Creekside Commercial Builders, Inc

Signature: _____

Name and Title: David Sosner, President

Date: October 24, 2024

SECTION 00 62 20

IRAN CONTRACTING ACT

As required by California Public Contract Code Section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor's status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 *et seq.*) is true and correct:

☒ The Contractor is not:

(1) identified on the current list of person and entities engaged in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or

(2) a financial instruction that extends, for 45 days or more, credit in the amount of $20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.

☐ The County has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, the City will be unable to obtain the goods and/or services to be provided pursuant to the Contract.

☐ The amount of the Contract payable to the Contractor for the Project does not exceed $1,000,000.

Signature: _____

Printed Name: David Sosner

Title: President

Firm Name: Creekside Commercial Builders, Inc

Date: October 24, 2024

Note: In accordance with Public Contract Code Section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of $250,000 or twice the Contract amount, termination of the Contract and/or ineligibility to bid on contracts for three years.

SECTION 00 41 00

BID FORM

Project: Yolo County Ag Department Shops Buildings

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with the County of Yolo ("the County") in the form included in the Contract Documents, Document 00 52 00 Construction Agreement (Contract), to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Sum and within the Contract Time indicated in this Bid and in accordance with all other terms and conditions of Contract Documents.

2. Bidder accepts all of the terms and conditions of the Contract Documents and the Notice to Bidders, including without limitation, those dealing with the disposition of Bid security. Bidder will sign and submit the Agreement with Bonds and other documents required by Document 00 20 00 Instructions to Bidders, within ten (10) calendar days after receipt of the County's Notice of Award.

3. In submitting this Bid, Bidder represents:

   (a) Bidder has examined copies of all of the Contract Documents and of the following Addenda (receipt of all of which is hereby acknowledged).

Date	Number
09/19/24	01
10/11/24	02
10/11/24	03
10/17/24	04

   (b) Bidder has visited the site and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as built conditions, and all local conditions and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto;

(c) Bidder has examined thoroughly and understood all reports, drawings and/or reports, available for Bidding purposes and accepts the determination set forth in these documents and Document 00 70 00 General Conditions of the limited extent of the information contained in such reports and drawings upon which the Bidder may be entitled to rely. Bidder agrees that except for the information so identified, Bidder does not and shall not rely on any other information contained in such reports and drawings.

(d) Bidder has conducted or obtained and has understood all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in paragraph 3(c) above) which pertain to the subsurface conditions, as built conditions, Underground Facilities and all other physical conditions at or contiguous to the site or otherwise which may affect the cost, progress, performance or furnishing of Work, as Bidder considers necessary for the performance or furnishing of Work at the Contract Sum, within the Contract Time and in accordance with the other terms and conditions of Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by Bidder for such purposes;

(e) Bidder has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

(f) Bidder has given Project Manager prompt written notice of all conflicts, errors, ambiguities or discrepancies that it has discovered in or among the Contract Documents and as built and actual conditions and the written resolution thereof by Project Manager is acceptable to Bidder.

4. Based on the foregoing, Bidder proposes and agrees to fully perform the Work within the time stated and in strict accordance with the Contract Documents for the following sum of money listed in the following Bid Schedule:

(continued next page)

SECTION 00 42 00

COUNTY OF YOLO BIDDER'S BOND

We, Creekside Commercial Builders, Inc. as Principal, and HARCO NATIONAL INSURANCE COMPANY as Surety, are bound unto THE COUNTY OF YOLO as Owner (Obligee), in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, jointly and severally,

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal is submitting a bid to the Obligee, for the **Yolo County Ag Department Shops Buildings** for which bids are to be opened in public at the **General Services Department, Procurement Division 120 West Main Street, Ste C, Woodland, CA 95695.**

NOW THEREFORE, if Principal is awarded the Contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two bonds with the Obligee, one to guarantee faithful performance of the contract and the other to guarantee payment for labor and materials, as required by law, then this obligation shall be null and void; otherwise it shall remain in full force.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including reasonable attorney's fees to be fixed by the Court.

Dated: October 11th, 2024

Creekside Commercial Builders, Inc.
Principal

Dave Sosner, President

HARCO NATIONAL INSURANCE COMPANY
Surety

By: David J. McKee, Attorney-In-Fact

ADDRESS OF SURETY FOR SERVICE OF NOTICE:

HARCO NATIONAL INSURANCE COMPANY

702 Oberlin Road

Raleigh, North Carolina 27605

NOTE: Signature of those executing for the Surety shall be properly acknowledged and accompanied by a Certificate of Acknowledgement

CALIFORNIA NOTARY ACKNOWLEDGEMENT
(INDIVIDUAL)

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of Arizona
County of Maricopa

On October 11th, 2024 before me, Ariela Santana, personally appeared David J. McKee, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Arizona that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____. (Seal)

Ariela Santana
Notary Public - ARIZONA
MARICOPA COUNTY
Commission No. 658591
My Commission Expires 10/31/2027

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POWER OF ATTORNEY

Bond # Bid Bond

HARCO NATIONAL INSURANCE COMPANY
INTERNATIONAL FIDELITY INSURANCE COMPANY

Member companies of IAT Insurance Group, Headquartered: 702 Oberlin Road, Raleigh, North Carolina 27605

KNOW ALL MEN BY THESE PRESENTS: That **HARCO NATIONAL INSURANCE COMPANY**, a corporation organized and existing under the laws of the State of Illinois, and **INTERNATIONAL FIDELITY INSURANCE COMPANY**, a corporation organized and existing under the laws of the State of New Jersey, and having their principal offices located respectively in the cities of Rolling Meadows, Illinois and Newark, New Jersey, do hereby constitute and appoint

PATRICK R. HEDGES, DAVID J. MCKEE, TED H. RARRICK, JOSEPH A. CLARKEN III, MELANIE ANKENEY, JENNIFER CASTILLO

Phoenix, AZ

their true and lawful attorney(s)-in-fact to execute, seal and deliver for and on its behalf as surety, any and all bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof, which are or may be allowed, required or permitted by law, statute, rule, regulation, contract or otherwise, and the execution of such instrument(s) in pursuance of these presents, shall be as binding upon the said **HARCO NATIONAL INSURANCE COMPANY** and **INTERNATIONAL FIDELITY INSURANCE COMPANY**, as fully and amply, to all intents and purposes, as if the same had been duly executed and acknowledged by their regularly elected officers at their principal offices.

This Power of Attorney is executed, and may be revoked, pursuant to and by authority of the By-Laws of **HARCO NATIONAL INSURANCE COMPANY** and **INTERNATIONAL FIDELITY INSURANCE COMPANY** and is granted under and by authority of the following resolution adopted by the Board of Directors of **INTERNATIONAL FIDELITY INSURANCE COMPANY** at a meeting duly held on the 13th day of December, 2018 and by the Board of Directors of **HARCO NATIONAL INSURANCE COMPANY** at a meeting held on the 13th day of December, 2018.

"**RESOLVED**, that (1) the Chief Executive Officer, President, Executive Vice President, Senior Vice President, Vice President, or Secretary of the Corporation shall have the power to appoint, and to revoke the appointments of, Attorneys-in-Fact or agents with power and authority as defined or limited in their respective powers of attorney, and to execute on behalf of the Corporation and affix the Corporation's seal thereto, bonds, undertakings, recognizances, contracts of indemnity and other written obligations in the nature thereof or related thereto; and (2) any such Officers of the Corporation may appoint and revoke the appointments of joint-control custodians, agents for acceptance of process, and Attorneys-in-fact with authority to execute waivers and consents on behalf of the Corporation; and (3) the signature of any such Officer of the Corporation and the Corporation's seal may be affixed by facsimile to any power of attorney or certification given for the execution of any bond, undertaking, recognizance, contract of indemnity or other written obligation in the nature thereof or related thereto, such signature and seals when so used whether heretofore or hereafter, being hereby adopted by the Corporation as the original signature of such officer and the original seal of the Corporation, to be valid and binding upon the Corporation with the same force and effect as though manually affixed."

IN WITNESS WHEREOF, **HARCO NATIONAL INSURANCE COMPANY** and **INTERNATIONAL FIDELITY INSURANCE COMPANY** have each executed and attested these presents on this 31st day of December, 2019

INTERNATIONAL FIDELITY INSURANCE COMPANY CORPORATE SEAL 1904 NEW JERSEY

STATE OF NEW JERSEY
County of Essex

STATE OF ILLINOIS
County of Cook

HARCO NATIONAL INSURANCE COMPANY CORPORATE SEAL 1994 ILLINOIS

Kenneth Chapman
Executive Vice President, Harco National Insurance Company
and International Fidelity Insurance Company

On this 31st day of December, 2019 , before me came the individual who executed the preceding instrument, to me personally known, and, being by me duly sworn, said he is the therein described and authorized officer of **HARCO NATIONAL INSURANCE COMPANY** and **INTERNATIONAL FIDELITY INSURANCE COMPANY**; that the seals affixed to said instrument are the Corporate Seals of said Companies; that the said Corporate Seals and his signature were duly affixed by order of the Boards of Directors of said Companies.

SHIRELLE A. OUTLEY NOTARY PUBLIC My Comm. Exp. 04-04-2023 No. 50079910 NEW JERSEY

IN TESTIMONY WHEREOF, I have hereunto set my hand affixed my Official Seal, at the City of Newark, New Jersey the day and year first above written.

Shirelle A. Outley a Notary Public of New Jersey
My Commission Expires April 4, 2023

CERTIFICATION

I, the undersigned officer of **HARCO NATIONAL INSURANCE COMPANY** and **INTERNATIONAL FIDELITY INSURANCE COMPANY** do hereby certify that I have compared the foregoing copy of the Power of Attorney and affidavit, and the copy of the Sections of the By-Laws of said Companies as set forth in said Power of Attorney, with the originals on file in the home office of said companies, and that the same are correct transcripts thereof, and of the whole of the said originals, and that the said Power of Attorney has not been revoked and is now in full force and effect.

IN TESTIMONY WHEREOF, I have hereunto set my hand on this day, October 11, 2024

A02759

Irene Martins, Assistant Secretary

No. 6516

STATE OF CALIFORNIA

DEPARTMENT OF INSURANCE

SAN FRANCISCO

Amended

Certificate of Authority

THIS IS TO CERTIFY, *That, pursuant to the Insurance Code of the State of California,*

Travelers Casualty and Surety Company of America

of Hartford, Connecticut, organized under the laws of Connecticut, subject to its Articles of Incorporation or other fundamental organizational documents, is hereby authorized to transact within this State, subject to all provisions of this Certificate, the following classes of insurance:

Fire, Marine, Surety, Disability, Plate Glass, Liability, Workers' Compensation, Common Carrier Liability, Boiler and Machinery, Burglary, Credit, Sprinkler, Team and Vehicle, Automobile, Aircraft, and Miscellaneous

as such classes are now or may hereafter be defined in the Insurance Laws of the State of California.

THIS CERTIFICATE *is expressly conditioned upon the holder hereof now and hereafter being in full compliance with all, and not in violation of any, of the applicable laws and lawful requirements made under authority of the laws of the State of California as long as such laws or requirements are in effect and applicable, and as such laws and requirements now are, or may hereafter be changed or amended.*

IN WITNESS WHEREOF, *effective as of the 1st day of July, 1997, I have hereunto set my hand and caused my official seal to be affixed this 16th day of June, 1997.*

Fee $92.00

Chuck Quackenbush
Insurance Commissioner

Rec. No.

Filed 5/28/97 *By* *Victoria S. Sidbury*
Deputy

Certification

I, the undersigned Insurance Commissioner of the State of California, do hereby certify that I have compared the above copy of Certificate of Authority with the duplicate of original now on file in my office, and that the same is a full, true, and correct transcript thereof, and of the whole of said duplicate, and said Certificate of Authority is now in full force and effect.

IN WITNESS WHEREOF, *I have hereunto set my hand and caused my official seal to be affixed this 31st day of December, 2007.*

Steve Poizner
Insurance Commissioner

By Pauline D'Andrea
Pauline D'Andrea

CALIFORNIA ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Sacramento }

On 10/24/2024 *Date* before me, Amber R. Marsh, Notary Public *Here Insert Name and Title of the Officer*,

personally appeared David Sosner *Name(s) of Signer(s)*

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

AMBER R. MARSH
Notary Public - California
Sacramento County
Commission # 2438044
My Comm. Expires Mar 12, 2027

Place Notary Seal and/or Stamp Above

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ *Signature of Notary Public*

OPTIONAL

Completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____	Signer's Name: _____
☐ Corporate Officer – Title(s): _____	☐ Corporate Officer – Title(s): _____
☐ Partner – ☐ Limited ☐ General	☐ Partner – ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact	☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator	☐ Trustee ☐ Guardian or Conservator
☐ Other: _____	☐ Other: _____
Signer is Representing: _____	Signer is Representing: _____

©2019 National Notary Association

Base Bid Total Price for the
Yolo County Ag Department Shops Buildings 3,898,734

(written) three million eight hundred ninety eight thousand seven hundred and thirty four **Dollars**

Enclosed find Bidder's Bond, certified check or cashier's check No._____of the

_____(Company/Bank), for $_____.

Dated this 24 day of October, 2024

5. Subcontractors are listed on the attached document 00 43 00, Subcontractors List.

6. The undersigned understands that the County reserves the right to reject this Bid, but that this Bid shall remain open and shall not be withdrawn for a period of ninety (90) calendar days from the date prescribed for its opening (to accommodate State financing process).

7. If written notice of the acceptance of this Bid, hereinafter referred to as Notice of Award, is mailed or delivered to the Undersigned within the stipulated time after the date set for the opening of this Bid, or at any other time thereafter before it is withdrawn, the undersigned will execute and deliver the documents required by Document 00 20 00 Instructions to Bidders including, but not limited to, Document 00 52 00 Construction Agreement, Document 00 61 00 Performance Bond, and Document 00 62 00 Payment Bond and Escrow Bid Documents, all within ten (10) calendar days after personal delivery or after receipt in the mails of the Notice of Award.

8. Notice of Award or request for additional information may be addressed to the undersigned at the address set forth below.

9. The undersigned herewith encloses a cash, cashier's check, certified check or corporate surety bond in the amount of ten percent (10%) of the total of Bid Items and made payable to: County of Yolo and is subject to all conditions imposed by law.

10. The undersigned agrees to commence work under this Contract on the date established and to complete all work within the time specified in Document 00 52 00 (Construction Agreement).

11. The undersigned agrees that, in accordance with Document 00 70 00 General Conditions liquidated damages for failure to complete all work in the contract within the time specified are as set forth in Document 00 52 00 (Construction Agreement).

12. The undersigned herewith encloses the completed Bidder's Bond – 00 42 00.

13. The undersigned herewith encloses the completed Subcontractors List – 00 43 00.

14. The undersigned herewith encloses the completed Bidder Information Sheet – 00 44 00.

15. The undersigned herewith encloses the completed List of Successful Projects form – 00 45 00.

16. The undersigned herewith encloses the completed Non-Collusion Declaration – 00 45 10.

17. The undersigned herewith encloses the completed Joint Apprenticeship Committee Certification– 00 45 26.

18. The undersigned herewith encloses the completed Statement re No Apprenticeship Violation – 00 45 27.

19. The undersigned herewith encloses the completed Acknowledgment re: Health Care Expenditure Requirement – 00 45 28.

20. The undersigned herewith encloses the completed Certification Against Lobbying – 00 45 46. (reserved)

21. The undersigned herewith encloses the completed Iran Contracting Act-00 62 20. (reserved).

22. The undersigned herewith encloses the completed Document 00 62 21 Fleet Compliance Certification.

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23) The names of all persons interested in the foregoing Bid as principals are:

David Sosner, President, Elizabeth Sosner, Secretary

(IMPORTANT NOTICE: If Bidder or other interested person is a corporation, give the legal name of corporation, state where incorporated, and names of president and secretary thereof; if a partnership, give name of the firm and names of all individual co-partners composing the firm; if Bidder or other interested person is an individual, give first and last names in full).

Name of Bidder: Creekside Commercial Builders, Inc
Legal Name of Corporation or Firm

CA Contractor's License No. 925942

DIR Registration No. 1000007395

Business Address 3131 Peacekeeper Way Ste 400
McClellan, Ca 95652

Email Address dave@creeksideinc.net

Telephone Number 916-783-8080

Date of Bid Thursday October 24, 2024

Signature of Bidder (Authorized to sign contracts on behalf of the Corporation or Firm)

David Sosner
Printed Name

President
Title

Bid Schedule

Yolo County Ag Department Shops Buildings

Contractor / Company: Creekside Commercial Builders, Inc.

***All line items on Bid Schedule form must be completed for valid bids.** The costs for any work shown or required in the Plans and Specifications, but not specifically identified as a line item are to be included in the related line items and no additional compensation shall be due to Contractor for the performance of the work.

Yolo County Ag Department Shops Buildings					
BID ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**	**UNIT**	**UNIT PRICE**	**NUMERICAL TOTAL**
	AG BUILDING				
1.	Mobilization & Demobilization	1	LS	$ 846,166	$ 846,166
2.	Concrete	1	LS	$ 264,092	$ 264,092
3.	Steel	1	LS	$ 6,262	$ 6,262
4.	Rough Carpentry	1	LS	$ 5,475	$ 5,475
5.	Casework	1	LS	$ 101,769	$ 101,769
6.	Insulation	1	LS	$ 7,859	$ 7,859
7.	Flashing & Sheet Metal	1	LS	$ 21,900	$ 21,900
8.	Joint Sealants	1	LS	$ 7,939	$ 7,939
9.	Doors/Frames/Hardware	1	LS	$ 26,673	$ 26,673
10.	Overhead Coil Doors	1	LS	$ 75,227	$ 75,227

Yolo County Ag Department Shops Buildings

BID ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	NUMERICAL TOTAL
11.	Glazing	1	LS	$ 12,653	$ 12,653
12.	Skylights	1	LS	$ 25,148	$ 25,148
13.	Gypsum Board Assemblies	1	LS	$ 133,418	$ 133,418
14.	Tiling	1	LS	$ 12,374	$ 12,374
15.	Acoustical Ceilings	1	LS	$ 13,896	$ 13,896
16.	Resin Flooring & Polished Concrete	1	LS	$ 58,364	$ 58,364
17.	Painting	1	LS	$ 21,314	$ 21,314
18.	Signage (Code required only)	1	LS	$ 5,593	$ 5,593
19.	Toilet Compartmenrts	1	LS	$ 13,679	$ 13,679
20.	Wall Protection	1	LS	$ 9,025	$ 9,025
21.	Toilet Accessories	1	LS	$ 5,500	$ 5,500
22.	Fire Protection Specialties	1	LS	$ 11,981	$ 11,981
23.	Lockers	1	LS	$ 3,549	$ 3,549
24.	Window Treatments	1	LS	$ 2,135	$ 2,135
25.	Pre-Engineered Metal Building	1	LS	$ 428,273	$ 428,273
26.	Fire Suppression	1	LS	$ 37,011	$ 37,011

Yolo County Ag Department Shops Buildings

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	NUMERICAL TOTAL
27.	Plumbing	1	LS	$ 233,235	$ 233,235
28.	HVAC & Controls	1	LS	$ 207,503	$ 207,503
29.	Electrical	1	LS	$ 291,708	$ 291,708
30.	Communications	1	LS	$ 68,328	$ 68,328
	AG BUILDING SUBTOTAL			2,976,047 $	2,976,047 $
	SITE IMPROVEMENTS				
31.	Demo Existing Pavement/Signage/Wheel Stops	1	LS	$ 40,274	$ 40,274
32.	Excavation & Grading Including any required Import or export or export to Balance the Site & exporting any unusable material	1	LS	$ 43,800	$ 43,800
33.	A.C. - PARKING LOT (4" A.C., 12")	3733	SF	$ 11.18	$ 41,734
34.	P.C.C. - ACCESS RAMP AND TRASH ENCLOSURE (6" P.C.C., 6" A.B.)	1400	SF	$ 25.60	$ 35,842
35.	P.C.C.-SIDEWALK (4 P.C.C., 4" A.B.)	1657	SF	$ 30.27	$ 50,150
36.	6" VERTICAL CURB	555	LF	$ 52.56	$ 29,171

Yolo County Ag Department Shops Buildings					
BID ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	NUMERICAL TOTAL
37.	DEEPENED VERTICAL CURB/WALL	116	LF	$ 104.03	$ 12,067
38.	4' WIDE VALLEY GUTTER	479	SF	$ 20.15	$ 9,651
39.	8" PERFORATED STORM DRAIN	180	LF	$ 102.22	$ 18,399
40.	STORM DRAIN CATCH BASIN	2	EA	$ 3,482.10	$ 6,964
41.	1.5" WATER PIPE (COMMERCIAL, PVC C901)	9	LF	$ 219	$ 1,971
42.	6" WATER PIPE (FIRE, PVC C900)	15	LF	$ 273.75	$ 4,106
43.	6" SEWER (SDR-35)	15	LF	$ 240.90	$ 3,614
44.	TRUNCATED DOMES	129	SF	$ 60.23	$ 7,769
45.	WHEEL STOP (PRECAST CONCRETE)	23	EA	$ 109.50	$ 2,519
46.	6" THICK, 3/4" CRUSHED ROCK	3250	SF	$ 4.49	$ 14,591
47.	INFILTRATION TRENCH (2.5' WIDTH, 3' DEPTH)	180	LF	$ 32.85	$ 5,913
48.	FENCING AND GATES	1	LS	$ 193,243	$ 193,243
49.	SIGNING AND STRIPING	1	LS	$ 5,256	$ 5,256
50.	EROSION CONTROL IMPLEMENTATION AND MANAGEMENT	1	LS	$ 8,829	$ 8,829
51.	Landscape	1	LS	$ 59,349	$ 59,349
52.	Site Electrical	1	LS	$ 163,374	$ 163,374

Yolo County Ag Department Shops Buildings

BID ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	NUMERICAL TOTAL
53	Electrical Switchgear Screen Wall	1	LS	21,900	21,900
	SITE IMPROVEMENT SUBTOTAL			$ 780,486	$ 780,486
	OFF-SITE IMPROVEMENTS				
54.	MOBILIZATION	1	LS	$ 19,710	$ 19,710
55.	TRAFFIC CONTROL AND PUBLIC SAFETY INCLUDING CONSTRUCTION SIGNING BARRICADES, ETC.	1	LS	$ 33,770	$ 33,770
56.	SAWCUT, REMOVE AND REPLACE EXISTING CURB, GUTTER, AND SIDEWALK	89	SF	$ 73.20	$ 6,515
57.	SAWCUT AND REMOVE EXISTING PAVING AND INSTALL 4" AC PAVING	260	SF	$ 40	$ 10,400
58.	1.5" BACKFLOW PREVENTION ASSEMBLY	1	EA	$ 4,380	$ 4,380
59.	1.5" WATER METER	1	EA	$ 3,285	$ 3,285
60.	1.5" WATER CONNECTION TO EXISTING MAIN	1	EA	$ 6,570	$ 6,570
61.	1.5" WATER PIPE	26	LF	$ 91.98	$ 2,391
62.	6" DOUBLE CHECK DETECTOR ASSEMBLY	1	EA	$ 21,681	$ 21,681
63.	6" WATER CONNECT TO EXISTING MAIN	1	EA	$ 4,818	$ 4,818

Yolo County Ag Department Shops Buildings					
BID ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	NUMERICAL TOTAL
64.	6" WATER PIPE (PVC C900 CLASS 200)	26	LF	$ 107.31	$ 2,790
65.	6" WATER VALVE (GATE)	1	EA	$ 2,168	$ 2,168
66.	6" FIRE DEPARTMENT CONNECTION	1	EA	$ 7,008	$ 7,008
67.	6" SEWER CLEAN OUT	1	EA	$ 1,205	$ 1,205
68.	6" SEWER PIPE (SDR-35)	67	LF	$ 100.74	$ 6,750
69.	6" SEWER CONNECT TO MAIN	1	EA	$ 8,760	$ 8,760
	OFF-SITE IMPROVEMENT SUBTOTAL			$ 142,200	$ 142,200

CONTINUED ON NEXT PAGE

SECTION 00 43 00

SUBCONTRACTOR LIST

YYolo County Ag Department Shops Buildings. The General Contractor shall list below all subcontractors who will be performing categories of work in excess of one- half (1/2) of one percent (1%) of the General Contractor's total bid price. All work not covered within the following list will be performed directly by the General Contractor. Yolo County will follow public contract Code Section 4104, where bids submitted must contain at least the Subcontractors; name, location of the place of business, CSLB No., DIR No., and type of work to be performed. The County will allow the other required information about the subcontractor to be submitted up to 24 hours after the bid submittal deadline. Copy to use additional forms as necessary.

	WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO.	CA LICENSE TYPE AND NO.	MAILING ADDRESS	PHONE NUMBER
1	~~Flooring DS (epoxy, Polished concrete)~~	~~Alder 4 Flooring DS Inc~~		~~1000021740~~ DS	~~850719~~ DS	~~3233 Zwight Rd Elk Grove, CA~~ DS	
2	~~Accessories, Toilet Partitions lockers DS~~	~~American Steel Metal Partition Co Inc~~ DS		~~1000008140~~ DS	~~777609~~ DS	~~5027 Roberts Ave~~ DS ~~Modesto, CA~~	
3	~~Cabinets, DS Wall Protection~~	~~Elite Wood~~ DS Design Inc		~~1000042157~~ DS	~~931500~~ DS	~~2010 Mercantile Rancho~~ DS ~~Cordova, CA~~	
4	Misc Metals	Woodland Welding Works		1000005074	550297	PO Box 1194 Woodland, CA	
5	~~DS~~ Concrete	Whiting Concrete Construction		1000060506	744156	PO Box 887 Rancho Murieta, CA	
6	~~Drywall DS~~	~~V Mear Framing and Drywall~~ DS		~~1000003040~~ DS	~~667764~~ DS	~~3236 Fircrest Rd~~ DS ~~Suite B Rancho Cordova CA~~	
7	Metal Building	Land X Construction Inc		PW-LR 1000461471	973168	2255 Pinehurst, Lincoln, CA	
8	~~Painting DS~~	~~Valdez Painting DS Inc~~		~~1000100110~~ DS	~~847~~ DS	~~2400~~ DS ~~Attachment 2 Sacramento, CA~~	
9	Overhead Doors	Industrial Door Company		PW-LR - 1001172085	1118556	10235 Systems Pkwy Ste B Sacramento, CA	
10	Fire Sprinklers	Williams Fire Protection		2000000960	1118777	623 Laurel Ave Oakdale, CA	
11	~~DOORS DS~~	~~CBG Midwest LLC door Discovery Door~~		~~1000060078~~ DS	~~1122974~~ DS	~~26701 Richard Rd Bedford Heights~~ OH	

SECTION 00 43 00

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	WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO.	CA LICENSE TYPE AND NO.	MAILING ADDRESS	PHONE NUMBER
12	~~Plumbing~~ DS	~~Adams Commercial Plumbing LLC~~ DS		~~1000730514~~ DS	~~1019909~~ DS	~~PO Box 1345 Yuba City, CA~~ DS	
13	HVAC	Top Notch Mechanicals		1000017371	972009	1337 N Market Blvd #200, Sacramento, CA	
14	Earthwork, Grading, Paving, Traffic Control, Underground Utilities	RD Morgan Construction Inc		1000014371	775301	1350 B Cook Rd Ione, CA 95640	
15	~~Fire alarm~~ DS	~~Rex Moore~~ DS Group, Inc		~~1000004059~~ DS	~~476827~~ DS	~~1001 Outfall Cir Sacramento, CA~~ DS	
16	~~Electrical~~ DS	~~HAAC Electric~~ DS		~~PW-LR 1000025757~~	~~498120~~ DS	~~407 E St, D-71 Marysville, CA~~ DS	
17	Plumbing	Mid-Valley Plumbing		1001003718	980037	PO 2028 Loomis, Ca	
18	Fences & Gates	Golden Bay Fence Plus Iron Works		1000000720	1004905	4104 South B St. Stockton, CA	
19	Landscaping	Elite Landscaping Construction, Inc.		1000008210	967955	PO Box 3736 Clovis. CA	
20	Accessories & Toilet Compartments	MURPHY Specialties		1000004027	956735	4992 Allison Pkwy Ste. B Vacaville, CA	
21	Flooring. Tile, epoxy, Polished Concrete	Capitol Commercial Flooring Inc.		1000002274	440458	3709 Bradview Dr. Sacramento, CA	
22	~~Cabinets~~ DS	~~River City~~ DS Millwork		~~1000073952~~ DS	~~920449~~ DS	~~3045 Fite Cir. DS Sacramento CA~~	

SECTION 00 43 00

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	WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO.	CA LICENSE TYPE AND NO.	MAILING ADDRESS	PHONE NUMBER
23	Painting	Mason Painting Inc.		1000008947	619967	PO Box 1115 Orangevale, CA	
24	Drywall	Harrison Contracting Inc.		1000074456	608709	1150 Fortress St Chico, CA	
25	Doors	Heritage Doors and Glass		2000000378	898245	920 Commerce CA. Manteca, CA	
26	Electric, low volt, Fire alarm	Lecair Electric Inc.		1000053184	994305	9421 Giverny CIR Antelope, CA	
27	Cabinets	River City Millwork		1000013252	620490	3045 Fite CIR Sacramento, CA	
28							
29							
30							
31							
32							
33							

Construction Base Bid Total		
Ag Building Bid Items 1-30 Total	Numerical Total $ 29,716,047	Written Total twomillion ninehundred seventy six thousand fourty seven dollars
Site Improvements Bid Items 31-53 Total	Numerical Total $ 780,486	Written Total sevenhundred eighty thousand four hundred eighty six dollars
Off-Site Improvements Bid Items 54-69 Total	Numerical Total $ 142,200	Written Total onehundred fourty two thousand two hundred dollars
Grand Total All 3 Above Categories	Numerical Total $ 30,638,734	Written Total threemillion eight hundred ninety eight thousand seven hundred thirty four dollars

Company Name Creekside Commercial Builders, Inc

By: David Sosner

Signature _____ **Date** October 24, 2024

SECTION 00 62 23

FLEET COMPLIANCE CERTIFICATION

Bidder hereby acknowledges that they have reviewed the California Air Resources Board's policies, rules and regulations and are familiar with the requirements of Title 13, California Code of Regulations, Division 3, Chapter 9, effective on January 1, 2024 (the "Regulation"). Bidder hereby certifies, subject to penalty for perjury, that the option checked below relating to the Bidder's fleet, and/or that of their subcontractor(s) ("Fleet") is true and correct:

- ☑ The Fleet is subject to the requirements of the Regulation, and the appropriate Certificate(s) of Reported Compliance have been attached hereto.
- ☐ The Fleet is exempt from the Regulation under section 2449.1(f)(2), and a signed description of the subject vehicles, and reasoning for exemption has been attached hereto.
- ☐ Bidder and/or their subcontractor is unable to procure R99 or R100 renewable diesel fuel as defined in the Regulation pursuant to section 2449.1(f)(3). Bidder shall keep detailed records describing the normal refueling methods, their attempts to procure renewable diesel fuel and proof that shows they were not able to procure renewable diesel (i.e. third-party correspondence or vendor bids).
- ☐ The Fleet is exempt from the requirements of the Regulation pursuant to section 2449(i)(4) because this Project has been deemed an Emergency, as defined under section 2449(c)(18). Bidder shall only operate the exempted vehicles in the emergency situation and records of the exempted vehicles must be maintained, pursuant to section 2449(i)(4).
- ☐ The Fleet does not fall under the Regulation or are otherwise exempted and a detailed reasoning is attached hereto.

Name of Bidder: Creekside Commercial Builders, Inc

Signature: _____

Name: David Sosner

Title: President

Date: October 24, 2024

CREEKSIDE

Building Community

INTEGRITY TRANSPARENCY ADAPTABILITY

Attn : Yolo County Procurement Division

120 West main Street, Suite C

Woodland, Ca 95695

RE: Yolo County AG Department Shops Building Project

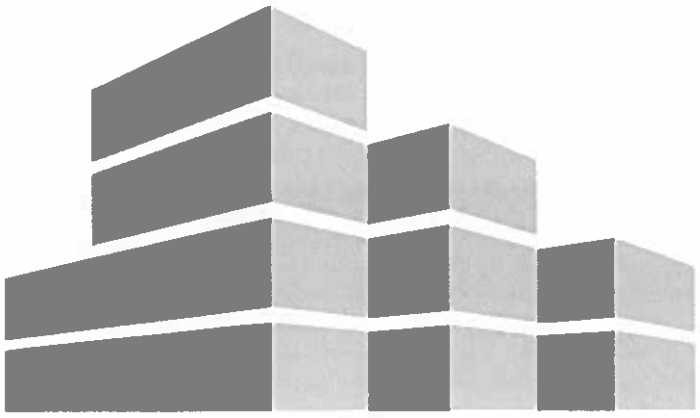
After extensive research and outreach to California Air Resource Board, Creekside Commercial Builders, Inc. is pleased to inform Yolo County that currently no equipment under our entity qualifies for registration of CARB Certification.

916-783-8080

3131 PEACEKEEPER WAY, SUITE 400
MCCLELLAN, CA 95652

CA: 925942

WWW.CREEKSIDEINC.NET



California Environmental Protection Agency

Air Resources Board

January 1, 2024

CERTIFICATE OF REPORTED COMPLIANCE
OFF-ROAD DIESEL VEHICLE REGULATION

is issued to

ROCK MORGAN ENTERPRISES

This certificate indicates that the fleet listed above has reported off-road diesel vehicles to the California Air Resources Board and has certified they are in compliance with title 13 CCR, section 2449. All applicable vehicles owned by the individual, company, or agency must be reported and labeled, as specified in Section 2449, with all possible completeness, else this certificate is null and void. **Certificate expires 2/28/2025**

Jack Kitowski
Chief, Mobile Source Control Division
California Air Resources Board

Off-road Diesel Fleet Identification

1120

To verify the authenticity of this certificate, enter this number at
http://www.arb.ca.gov/doors/compliance_cert1.html

October 24, 2024

RE: Yolo County Ag Department

Yolo County General Services
Procurement Division
120 West Main Street, Suite C
Woodland, CA 95695

To the Procurement Division:

Please find attached our completed subcontractor list with the requested information. Per bid instructions, this information can be submitted within 24 hours of bid opening. Please let me know if you have any questions.

We are very excited for this opportunity and hope to partner with the County to deliver a successful project.

Thanks,

Holly Kuchenthal

Estimator
hhockett@creeksideinc.net
916-546-1389 (D)

916-783-8080
3131 PEACEKEEPER WAY, SUITE 400
MCCLELLAN, CA 95652
CA: 925942
WWW.CREEKSIDEINC.NET

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ORIGIN ID:SMFA (530) 816-0734
DAVID SOSNER

3131 PEACEKEEPER WAY, SUITE 400

MCCLELLAN, CA 95652
UNITED STATES US

SHIP DATE: 24OCT24
ACTWGT: 0.11 LB
CAD: 106639227/INET4535

BILL SENDER

TO **PROCUREMENT DIVISION**
YOLO COUNTY GENERAL SERVICES
120 WEST MAIN STREET
SUITE C
WOODLAND CA 95695
(530) 666-8073 REF:
INV:
PO: DEPT:

59CJ8/2D2B/C6C4

FedEx Express

TRK# 0201 **7795 0411 0083**

FRI - 25 OCT 12:00P
PRIORITY OVERNIGHT

84 SMFA

95695
CA-US SMF

SECTION 00 43 00

SUBCONTRACTOR LIST

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	WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO.	CA LICENSE TYPE AND NO.	MAILING ADDRESS	PHONE NUMBER
1	~~Flooring~~ (epoxy, ~~Painted concrete~~)	~~Abbey Flooring inc~~		1000001740	850719	~~3233 Twigg Rd~~ Elk Grove, CA	
2	~~Accessories, Toilet Partitions Lockers~~	~~American Sheet Metal Partition Co inc~~		~~1000008140~~	277769	~~5027 Roberts Ave~~ McClellan, CA	
3	~~Cabinets, Wall Protection~~	~~Elite Wood Designs inc~~		1000042152	931500	~~2010 Mercantile Rancho~~ Cordova, CA	
4	Misc Metals	Woodland Welding Works	$25,719	1000005074	550297	PO Box 1194 Woodland, CA	530-666-5531 x20
5	Concrete	Whiting Concrete Construction	368,762	1000060506	744156	PO Box 887 Rancho Murieta, CA	916 354-2756
6	~~Drywall~~	~~V-Mark Framing and Drywall~~	~~$111,111~~	1000003040	~~667766~~	~~3280 Fitzgerald Rd Suite B Ravens Rancho~~ CA	
7	Metal Building	Land X Construction Inc	411,117	PW-LR 1006961471	973168	2255 Pinehurst, Lincoln, CA	530-848-3314
8	~~Painting~~	~~Valdez Painting inc~~		1000010016	897096	~~2900 Attamira Blvd~~ Sacramento, CA	
9	Overhead Doors	Industrial Door Company	68,700	PW-LR-1001172085	1118556	10235 Systems Pkwy #C Sacramento, CA	916-386-6003
10	Fire Sprinklers	Williams Fire Protection	23,800	2000009160	1118777	623 Laurel Ave Oakdale, CA	916-846-7104
11	~~Doors~~	~~CBG Midwest LLC dba Discovery Door~~		1000060078	1122979	~~26701 Richmond Rd~~ Bedford Heights, ~~OH~~	

SECTION 00 43 00

SUBCONTRACTOR LIST

YYolo County Ag Department Shops Buildings. The General Contractor shall list below all subcontractors who will be performing categories of work in excess of one- half (1/2) of one percent (1%) of the General Contractor's total bid price. All work not covered within the following list will be performed directly by the General Contractor. Yolo County will follow public contract Code Section 4104, where bids submitted must contain at least the Subcontractors; name, location of the place of business, CSLB No., DIR No., and type of work to be performed. The County will allow the other required information about the subcontractor to be submitted up to 24 hours after the bid submittal deadline. Copy to use additional forms as necessary.

	WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO.	CA LICENSE TYPE AND NO.	MAILING ADDRESS	PHONE NUMBER
12 DS	~~Plumbing~~ DS	~~Adams Commercial Plumbing LLC~~ DS		~~1000730514~~ DS	~~1019909~~ DS	~~PO Box 1915 Yolo City, CA~~ DS	
13	HVAC	Top Notch Mechanicals	149,500	1000017371	972009	1337 N Market Blvd #200, Sacramento, CA 2381	916-367-2381
14	Earthwork Grading, Paving, Traffic Control, Underground Utilities	RD Morgan Construction Inc	2661689	1000014371	775301	1350 B Cook Rd Lone, CA 95640	209-274-0735
15 DS	~~Fire Alarm~~ DS	~~Rex Moore Group Inc~~ DS		~~1000004059~~ DS	~~976827~~ DS	~~4001 Outfall Cir Sacramento, CA~~ DS	
16 DS	~~Electrical~~ DS	~~MAC Electric~~ DS		~~PW-LR 1001025757~~ DS	~~998120~~ DS	~~407 C St E-11 Marysville, CA~~ DS	
17	Plumbing	Mid-Valley Plumbing	213,000	1001003718	986037	PO 2028 Loomis, CA	916-652-5717
18	Fences + Gates	Golden Bay Fence Plus Iron Works	172,478	1000000720	664905	4404 South B St Stockton, CA	209-944-5812
19	Landscaping	Elite Landscape Construction, Inc	54,200	1000008210	967955	PO Box 3736 Clovis, CA	559-292-2900
20	Accessories and Toilet Compartments	Murphy Specialties	16,015	1000004027	956735	4992 Allison Pkwy Ste B Vacaville	707-761-8000
21	Flooring, Tile, Epoxy, Polished Concrete	Capitol Commercial Flooring Inc	62,100	1000002774	1410458	3709 Bradview Dr Sacramento, CA	916-509-1960
22 DS	~~Cabinets~~ DS	~~River City Millwork~~ DS		~~1000013252~~ DS	~~1020490~~ DS	3045 Fite Cir, Sacramento, CA DS	

SECTION 00 43 00

SUBCONTRACTOR LIST

YYolo County Ag Department Shops Buildings. The General Contractor shall list below all subcontractors who will be performing categories of work in excess of one- half (1/2) of one percent (1%) of the General Contractor's total bid price. All work not covered within the following list will be performed directly by the General Contractor. Yolo County will follow public contract Code Section 4104, where bids submitted must contain at least the Subcontractors; name, location of the place of business, CSLB No., DIR No., and type of work to be performed. The County will allow the other required information about the subcontractor to be submitted up to 24 hours after the bid submittal deadline. Copy to use additional forms as necessary.

	WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO.	CA LICENSE TYPE AND NO.	MAILING ADDRESS	PHONE NUMBER
23	Painting	Mason Painting Inc	19,405	1000008947	819987	PO Box 1115 Orangevale, CA	916-852-8060
24	Drywall	Harrison Contracting Inc	121,843	1000044510	608709	1150 Fortress St Chico, CA	530-899-1778
25	Doors	Heritage Doors and Glass	24,359	2000000378	898245	626 Commerce Ct Manteca, CA	~~916-~~ ~~785~~ 209-815-990
26	Electric, Low Volt, Fire Alarm	Lecair Electric Inc	438,000	1000053184	994305	8421 Giverny Cir Antelope, CA	916-735-3144
27	Cabinets	River City Millwork	82,627	1000013252	620490	3045 Fitch Ir Sacramento, CA	916-364-8981
28							
29							
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PROJECT MANUAL

Volume I: Bidding and Contracting Requirements

Yolo County Ag Department Shops Building
Woodland, CA 95694

September 18, 2024

Bids Due before 2:00PM, Thursday, October 24, 2024
at Yolo County General Services
Procurement Division
120 West Main Street, Suite C
Woodland, CA 95695

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SECTION 00 01 10

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VOLUME 1: BIDDING AND CONTRACTING REQUIREMENTS

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SECTION 00 01 15

LIST OF BID DOCUMENTS

BID DOCUMENTS

A. PROJECT MANUAL
   1. Volume 1: Bidding and Contracting Requirements dated September 18, 2024
   2. Volume 2: Technical Specifications dated March 14, 2024

B. PROJECT PLANS
   3. Volume 3: Yolo County Ag Department Shops Building Plans dated December 9, 2022, December 12, 2023 and updates through 7/29/2024
   4. Volume 4: Civil Off-site Plans dated January 4, 2024

C. SUPPLEMENTAL DOCUMENTS
   1. Structural Calculation dated September 2024
   2. Drainage Study dated January 8, 2024
   3. 2_Encroahment Permit Application

SECTION 00 12 00

NOTICE TO BIDDERS

NOTICE IS HEREBY GIVEN that the County of Yolo will receive sealed bids in accordance with the provisions of the Public Contract Code from contractors licensed for the furnishing of all labor, materials, equipment, transportation, mobilization, demobilization, permitting, disposal and any other required services for the performance of the following Work:

Yolo County Ag Department Shops Building

The extent of work is identified in the Technical Specifications Volume II.

All work to be performed during the hours of 7:30am-5:00pm, Monday through Friday.

Plans and Specifications for the work will be available as noted herein.

All questions regarding Plans and Specifications and Interpretations or Clarifications for this Initiation for Bid must be entered electronically through Periscope (formerly Bid Sync at (https://www.BidSync.com). The County's Project Manager will respond to all Contractor questions through the Periscope (formerly Bid Sync) Question and Answer section on this website.

SEALED BIDS:

Sealed bids on the above project shall be filed with Yolo County General Services Department, Procurement Division, located at 120 West Main Street, Suite C., Woodland, CA 95695, before **2:00 pm** on **Thursday, October 24, 2024.**

All bids must be marked clearly on the envelope:

"Yolo County Ag Department Shops Building"

Said bids will be opened in public after **2:15 pm** of said day at Yolo County General Services Department -Procurement Division 120 West Main Street, Ste. C, Woodland, CA 95695. Bids shall be submitted only on forms provided in the Bid Documents and shall be accompanied by all documents and information required to be submitted by the Instructions to Bidders and by law. No bid may be withdrawn after the time established for receiving bids or before the award and execution of the Contract, unless the award is delayed for a period exceeding one hundred twenty (120) calendar days. The low bidder, for purposes of the award, shall be the responsive bidder offering the low lump sum amount for the base bid and meeting all other bid submittal requirements. The County reserves the right to reject any or all bids.

CONTRACTOR'S LICENSE REQUIRED:

The Board will not consider or accept any bids from contractors who are not licensed to do business in the State of California. Contractor warrants and represents that he/she holds a valid California license pursuant to the State Contractors License Act [Business and Professions Code Section 7000, et seq.], that his/her license is in good standing and that he/she possess a Class A or Class B; C-10, C-12, C-27 and C-36 license and any other additional licensing needed to perform all required categories and type of work -- or any others as identified per design plan. Copies of the Contractor's State Contractor license(s) must be provided, along with their bid.

REQUIRED LISTING OF PROPOSED SUBCONTRACTORS:

Each proposal shall have listed therein the name and address of each subcontractor to whom the Bidder proposes to subcontract portions of the Work in an amount in excess of one-half of one percent (½ of 1%) of his total Bid in accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100, through 4113 inclusive of the Public Contract Code. The Bidder's attention is invited to other provisions of said Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions.

Notice is hereby given that the Project is a public works project within the requirements of Division 2, Part 7, Chapter 1 of the California Labor Code, and that each bidder and listed subcontractor is required to be registered pursuant to Labor Code section 1725.5 at the time of bidding. Failure of the bidder to be registered at the time of bidding shall render the bid non-responsive and unavailable for award. Bidder's listing of an unregistered subcontractor may render the bid non-responsive and unavailable for award unless such failure is the result of an inadvertent error and the provisions of Labor Code section 1771.1 apply.

JOINT APPRENTICESHIP COMMITTEE PARTICIPATION REQUIREMENT

The County has adopted additional requirements for certain "Covered Projects" as defined in the County's Policy on Procurement. This Project is considered a "Covered Project" and is subject to the County's Joint Apprenticeship Committee (JAC) participation requirement. The County has adopted a JAC participation requirement for certain public projects estimated to cost more than one-million dollars ($1,000,000). A JAC means an apprenticeship program comprised of an equal number of employer and employee representatives approved by the State of California Division of Apprenticeship Standards. This JAC requirement is in addition to the apprenticeship requirements of the Prevailing Wage Laws.

To satisfy the County's JAC participation requirement, Contractors must submit with their bid the Joint Apprenticeship Committee Participation Certification with signed evidence satisfactory to the Procurement Manager or the Procurement Manager's designee that they participate in a JAC by being a signatory to a JAC or employ registered apprentices dispatched by a JAC. Such evidence may be in the form of a signed letter from a JAC confirming the Contractor is a signatory to a JAC or has hired registered apprentices who are active participants of a JAC.

In addition, Bidders must submit a signed "Statement Re: No Apprenticeship Violation" confirming the Bidder has not been found in violation of any provision of state or local apprenticeship laws or regulations in the past three years.

HEALTH CARE EXPENDITURE REQUIREMENT

The County has also adopted the following health care expenditure requirement for certain public projects estimated to cost more than one-million dollars ($1,000,000):

Each Contractor with construction craft employees shall make health care expenditures for each such employee in an amount per hour worked on the Covered Project equivalent to at least the hourly pro rata cost of a Covered California Platinum level plan for two 40-year-old adults and two dependents 0 to 14 years of age for the Covered California rating area in which the development is located. Qualifying expenditures shall be credited toward compliance with prevailing wage payment requirements up to the amount determined by the Director of Industrial Relations pursuant to Sections 1773 and 1773.9 of the Labor Code. Health care expenditures in excess of that amount shall not be so credited. "Health care expenditures" include contributions under Sections 501(c) or (d) or 401(a) of the Internal Revenue Code and payments toward "medical care" as defined under Section 213(d)(1) of the Internal Revenue Code. A Contractor that is signatory to a valid collective bargaining agreement that requires payment of at least the prevailing wage, participation in a joint labor-management apprenticeship program, and the provision of health care payments for all construction craft employees shall be deemed in compliance. A Contractor without construction craft employees shall show a contractual obligation that its subcontractors comply with this paragraph.

Bidders must submit a signed Acknowledgment confirming they have read and will comply with this requirement.

CALIFORNIA AIR RESOURCES BOARD REQUIREMENT

The California Air Resources Board ("CARB") implemented amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulations ("Regulation") which are effective on January 1, 2024 and apply broadly to all self-propelled off road diesel vehicles 25 horsepower or greater and other forms of equipment used in California. A copy of the Regulation is available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/off-roaddiesel/appa-1.pdf. Bidders are required to comply with all CARB and Regulation requirements, including, without limitation, all applicable sections of the Regulation, as codified in Title 13 of the California Code of Regulations section 2449 et seq. throughout the duration of the Project. Bidders must provide, with their Bid, copies of Bidder's and all listed subcontractors' most recent, valid Certificate of Reported Compliance ("CRC") issued by CARB. Failure to provide valid CRCs as required herein may render the Bid non-responsive.

The County is a Public Works Awarding Body, as defined under Title 13 California Code of Regulations section 2449(c)(46). Accordingly, Bidders must submit, with their Bids, valid Certificates of Reported Compliance ("CRC") for the Bidder's fleet and for the fleet(s) of its listed subcontractors (including any applicable leased equipment or vehicles). Bidders must additionally complete and submit the Fleet Compliance Certification, included in the Bid Documents. Failure to provide a CRC for the Bidder, and for all listed subcontractors, or failure to complete the Fleet Compliance Certification, may render the Bid non-responsive.

BID EXAMINATION AND PREPARATION:

Project Documents may be obtained at Periscope (formerly Bid Sync) at (https://www.BidSync.com) or at the Yolo County Website (under *Doing Business with the County*). Documents will be available beginning on January xx, 2024. It is the bidder's responsibility to arrange for printing services to obtain printed copies of the bid documents. The contract documents may also be examined at the following locations:

Construction Bid Board
Dodge Data & Analytics
Sacramento Regional Builders Exchange
Placer County Contractors Association & Builders

The Bidder shall carefully examine the Bid Documents, including the Plans and Specifications and the Asbestos Inspection Report, and satisfy the Bidder as to their sufficiency, and shall not at any time after submission of the Bid, dispute or complain of such Plans or Specifications nor assert that there is any misunderstanding in regard to the location, extent or nature or amount of work to be performed in accordance thereto. Should a Bidder find discrepancies or omissions in the Plans and Specifications, the Bidder shall notify the Project Manager immediately. Interpretations or clarifications considered necessary by the Project Manager shall be by addenda, mailed or electronically delivered to all plan holders and acknowledged on Bid form. Questions received after **2:00 p.m. of October 10, 2024** will not be answered. The issuance and release of the final addendum is estimated to be **Thursday , October 17, 2024.**

The Bid shall have all items filled in and the signatures of all persons signing the Bid shall be in long-hand. Mistakes must be corrected, and the correction inserted and initialed in ink by the person signing the Bid. Erasures and/or correction fluid are NOT acceptable. Changes must be lined out and corrections inserted adjacent and initialed by the bidder's authorized representative. No proposal will be considered which makes exceptions, changes or reservations to the Plans and Specifications.

The bids must supply all information required by the bid documents & specifications. Bids must be full and complete. The County reserves the right in its sole discretion to reject any bid as non-responsive as a result of any omission or error in the bid.

SUBSTITUTIONS:

Bids shall be based on products and systems specified in the Bid Documents or listed by name in addenda. Contractors and materials suppliers may submit requests for substitutions up to 35 days following Notice of Award.

NON-COLLUSION DECLARATION:

Bidders shall include with their bids a signed declaration under penalty of perjury stating that their bid is not a sham or a collusive bid. The declaration is to be signed exactly as worded; no alternate wording will be accepted. The declaration is included with the bid.

DEBARMENT AND SUSPENSION

By signing and submitting a bid for the Project, Bidder represents and warrants that it is eligible to bid and work on this project pursuant to Sections 1777.1 and 1777.7 of the California Labor Code and other applicable provisions of law. Further, Bidder acknowledges that it is prohibited from performing work on this project with a subcontractor who is ineligible to perform work on public works project pursuant to Sections 1777.1 and 1777.7.

ECONOMIC SANCTIONS

Pursuant to California State Executive Order N-6-22 ("Executive Order") imposing economic sanctions against Russia and declaring support of Ukraine, County shall terminate any contract with any individual or entity that is in violation of the Executive Order or that is subject to economic sanctions therein and shall not enter a contract with any such individual or entity while the Executive Order is in effect. By signing and submitting a bid, Bidder acknowledges and represents that it is aware of and shall comply with the Executive Order and that Bidder is not a target of economic sanctions pursuant to the Executive Order or the federal government, nor is Bidder conducting prohibited transactions with sanctioned individuals or entities. Violation of the Executive Order shall be grounds for County to terminate the Construction Agreement.

BONDS AND INSURANCE REQUIRED:

A bid security shall be provided with each Bid. Bid security shall be in an amount of not less than ten percent (10%) of the total amount of the Bid and shall be cash, a certified check or cashier's check drawn to the order of the County of Yolo or a Bidder's Bond executed by a surety satisfactory to the County of Yolo in the form provided in the Proposal section of these Bid Documents. The Bidder to whom award is made shall provide Certificates of Insurance as required in Article 2 of the General Conditions, and shall complete and submit the Performance Bond and Payment Bond forms contained in the Contract Documents.

PREVAILING WAGE PROVISION:

a. Pursuant to Labor Code Section 1770 et seq., 1773, 1773.1, 1773.2, 1773.6, 1773.7, and 1720 each laborer or mechanic of contractor or any subcontractor engaged in work on the project under this Contract shall be paid not less than the hourly wage rate of per diem wages set forth in the prevailing wage rate schedule published by the Director of Industrial Relations regardless of any contractual relationship which may be alleged to exist between contractor or any subcontractor and such laborers and mechanics. Interested parties may obtain the current wage information by submitting their requests to the Department of Industrial Relations, Division of Labor Statistics and Research, P.O. Box 603, San Francisco, CA 94101, or at www.dir.ca.gov/dlsr/pwd.

b. Any laborer or mechanic employed to perform work on the project under this Contract, which work is not covered by any of the foregoing classifications, shall be paid not less than the prevailing rate of per diem wages specified herein for the classification which most nearly corresponds to the work to be performed by him/her.

c. The foregoing specified prevailing wage rates are minimum rates only, and the contractor may pay any wage rate in excess of the applicable rates contained in this Contract.

d. Pursuant to Labor Code Section 1775, the contractor as a penalty to the owner shall forfeit $200.00 for each calendar day, or portion thereof for each worker paid less than the prevailing rate established by the Department of Industrial Relations for such work or craft in which such worker is employed. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which the worker was paid less than the prevailing wage rate shall be paid to each worker by the contractor. NOTE: an error on the part of an awarding body does not relieve the contractor from responsibility for payment of the prevailing rate of per diem wages and penalties pursuant to Labor Code Sections 1770-1775.

e. Prevailing wage rates are available through the following website: https://www.dir.ca.gov/OPRL/dprewagedetermination.htm.

f. All contractors and subcontractors are subject to the provisions of Sections 1810 through 1814 of the California Labor Code which provide for the maximum hours a worker is to be employed and the amount and rate of overtime compensation.

AWARD OF CONTRACT:

Bids will be considered for award by the Yolo County General Services Department. The County of Yolo reserves the right after opening bids to reject any or all bids, or to waive any informality (non-responsiveness) in any bid, or to make award to the lowest responsive, responsible bidder and reject all other bids, as it may best serve the interests of the County.

If this Contract is to be awarded, the Notice of Award shall be issued to the lowest responsible, responsive bidder within One-Hundred Twenty (120) days following the bid opening.

As a condition of award, the successful Bidder will be required to submit bonds and evidence of insurance prior to execution of the Agreement by the County. Failure to meet this requirement shall constitute abandonment of the Bid by the Bidder and forfeiture of the Bid Bond. Award will then be considered to the next lowest responsible Bidder.

All bids will be compared using the Opinion of Probable Cost prepared by the AE of Record for the project. For the purposes of bonding, the OPC for the base bid work is in the range of $3,081,724.00.

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PRE-BID CONFERENCE:

A mandatory pre-bid conference is scheduled for **2:00pm** on **October 3, 2024,** at the project site located at 120 West Main Street, Woodland, CA right outside of Ste. C. The County shall allow a ten-minute grace period for tardiness to the job walk. Any questions that can be answered at that time by direct reference to the Contract, Plans and Specifications, will try to be answered. Questions that cannot be so answered will be addressed, as necessary, by written addendum. Submission of a bid shall be considered an acknowledgment of familiarity with the Contract, Plans and Specifications, and conditions at the site. Oral statements made during the bidding period may not be relied upon and will not be binding or legally effective.

PROJECT MANAGER:

All communications relative to the Contract Documents and Plans shall be posted on Periscope (formerly BidSync). No oral responses to any questions concerning the content of the Plans and Contract Documents will be given. Responses, if any, will be in the form of written addenda to the Contract Documents and Plans.

By order of the Yolo County General Services Department, County of Yolo, State of California.

By:

Chris Rice
County of Yolo
Project Manager

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SECTION 00 20 00

INSTRUCTIONS TO BIDDERS

1. Bids are requested for a general construction contract, or work described in general, as follows:
   Yolo County Ag Department Shops Building

2. The County of Yolo will receive sealed bids from Bidders as stipulated in Document 00 12 00, Notice to Bidders.

3. Apparent low Bid will be based solely on: Base Bid Price. All Bidders are required to submit Bids on all bid items.

4. Bidders must submit bids on Document 00 41 00 Bid Form. Bids not submitted on the required form shall be deemed non-responsive and shall not be considered.

5. Bidders must submit cash, a cashier's check, a certified check or a corporate surety bond of not less than ten percent (10%) of amount bid, payable to the County, with their Bids. Required form of corporate surety bond, Document 00 42 00 County of Yolo Bidder's Bond, is provided by the County. Bids submitted without necessary bid security will be deemed non-responsive and will not be considered.

6. Bidders must submit names of all subcontractors and their respective bid item sub-bids on Document 00 43 00 Subcontractors List for those subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of total bid. Any violation of this provision may result in Bid being deemed non-responsive and not being considered.

7. Bidders must submit Document 00 44 00 Bidder Information Sheet with their bids. Bids submitted without the Bidder Information Sheet will be deemed non-responsive and will not be considered.

8. Bidders must submit Document 00 45 00 List of Successful Projects. Bids submitted without the list will be deemed non-responsive and will not be considered.

9. Bidders must submit Document 00 45 10 Non-collusion Declaration with their bids. Bids submitted without the declaration will be deemed non-responsive and will not be considered.

10. Bidders must submit Document 00 45 26 Joint Apprenticeship Committee Certification

11. Bidders must submit Document 00 45 27 Statement re No Apprenticeship Violation

12. Bidders must submit Document 00 45 28 Acknowledgment re: Health Care Expenditure Requirement

13. Bidders must submit Document 00 45 46 Certification Against Lobbying with their bids. Bids submitted without the certification will be deemed non-responsive and will not be considered.
(reserved)

14. Bidders must submit Document 00 62 20 Iran Contacting Act with their bids. Bids submitted without the certification will be deemed non-responsive and will not be considered.

15. Bidders must submit Document 00 62 21 Fleet Compliance Certification with their bid. Bids submitted without the form will be deemed non-responsive and will not be considered.

16. Bidders must supply all information required by Bid documents and specifications. Bids must be full and complete. The County reserves the right in its sole discretion to reject any Bid as non-responsive as a result of any error or omission in the Bid.

17. A mandatory Pre-bid Conference and Site Visit will be held as referenced in Document 00 12 00, Notice to Bidders, to clarify such matters as Bidders may request. The referenced Pre-bid Conference and Site Visit will take approximately two hours. The County will transmit to all prospective Bidders of record such Addenda as the County in its discretion considers necessary in response to questions arising at the Pre-bid Conference. The sign in sheet at the Pre-bid conference will be posted by addendum on Periscope (formerly Bid Sync) following the Pre-bid conference. Oral statements shall not be relied upon and will not be binding or legally effective. Addenda issued as a result of the Pre-bid Conference, shall constitute the sole and exclusive record and statement of the results of the Pre-bid Conference.

18. Bids shall be clearly written without erasure or deletions. The County reserves the right to reject any Bid containing erasures or deletions.

19. Bidders may not modify Bid Form or qualify their Bids.

20. Submission of Bid signifies careful examination of Contract Documents and complete understanding of the nature, extent and location of Work to be performed. Bidder must complete the tasks listed below in subsections as a condition to bidding and submission of Bid shall constitute the Bidder's express representation to the County that Bidder has fully completed the following:

    (A) Bidder has visited the site and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, existing facility conditions for demolition and removal, Site, locality, actual conditions, existing access and facility conditions, and all local conditions and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto;

    (B) Bidder has given Project Manager prompt written notice of all conflicts, errors, ambiguities or discrepancies that it has discovered in or among the Contract Documents and as-built and actual conditions and the written resolution thereof by Project Manager is acceptable to Bidder.

21. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are deemed included in the bid documents.

(C) DIR REGISTRATION AND NOTICE: To be qualified to bid on, be listed in a bid proposal or engage in the performance of any public work contract subject to Labor Code section 1720, contractors and subcontractors must be registered with the Department of Industrial Relations. Failure to provide this information at the time of bid will result in disqualification. Please see http://www.dir.ca.gov/Public-Works/PublicWorks.html for more information. No contract will be entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work provided at the time of bid. If awarded a contract, the bidder and its subcontractors, at all tiers, shall maintain active registration with the Department of Industrial Relations for the duration of the project. This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Each contractor and subcontractor must furnish certified payroll records to the Labor Commissioner at least monthly.

(D) A ***reminder*** to General Contractors in regard to State Public Contracting and apprenticeship, there are additional local Yolo County requirement concerning participation in a Joint Apprenticeship Committee and a Health Care Expenditure requirement that apply to the Project pursuant to the County's Procurement Rules. See Section 00 12 00, 0045, 26, 00 45 27, and 00 45 28 for additional information regarding these requirements and the related forms that must be included with your bid.

22. All questions regarding Plans and Specifications and Interpretations or Clarifications for this Invitation for Bid must be entered electronically through the County's electronic solicitation system, **Periscope (formerly Bid Sync)** at https://www.BidSync.com. The County Project Manager will respond to all Contractor questions through the Periscope (formerly Bid Sync) Question and Answer section on this website. Questions received less than seven (7) days prior to the date for opening Bids may not be answered. Only questions answered in BidSync or by formal written Addenda posted in Periscope (formerly BidSync) will be binding. Oral and other interpretations or clarifications will be without legal effect.

23. Addenda may also be issued to modify the Bidding Documents as deemed necessary by the County and consultants.

24. Addenda shall be acknowledged on Bid Form by number and shall be part of Contract Documents. Contractor shall be responsible for obtaining all addenda published and complete listing of Addenda may be secured from the Project Manager.

25. Substitutions: Bids shall be based on products and systems specified in Contract Documents or listed by name in Addenda. Contractors and materials suppliers may submit requests for substitutions up to thirty-five (35) days following the Notice of Award.

(E) Requests for substitutions shall contain sufficient information to assess acceptability of product or system and impact on Project (see Specification Section 01 25 00 for criteria). Insufficient information shall be ground for rejection of substitution.

(F) Substitutions may be requested after Contract is signed in accordance with requirements specified in Document 00 70 00 General Conditions and Specifications Section 01 25 00.

(G) Substitutions may not be requested during bidding or between bid opening and issuance of the Notice of Award.

26. Bids will be received at County of Yolo, Procurement Division Office 120 West Main Street, Suite C, Woodland, CA 95695 by the County and/or Project Manager who will receive them and time/date them. Bids submitted by mail must be received prior to the opening of bids; the County will not be held responsible for the failure of delivery.

(H) Envelopes or boxes must be sealed, and marked with name and address of the Bidder, and addressed to:

Yolo County Procurement Division
120 West Main Street, Suite C
Woodland, CA 95695

(I) Mark envelopes:

Yolo County Ag Department Shops Buildings

(J) Envelopes must be submitted by date and time shown in Document 00 12 00, Notice to Bidders.

(K) Bids must contain the following, fully executed documents:

1) Document 00 41 00 Bid Form: Must be filled in and signed by Bidder.

2) Cash, Cashier's Check or Certified Check, or Document 00 42 00 County of Yolo Bidder’s Bond: If submitted, Document 00 42 00 is to be executed by Bidder and its surety.

3) Document 00 43 00 Subcontractors List: If Bidder intends to employ sub-contractors, it is necessary to furnish information required on this form, in accordance with instructions contained herein. It is acceptable for the bidder to provide the city and state only on bid day and within 24 hours of the bid due date provide the mailing addresses & phone numbers.”

4) Document 00 44 00 Bidder Information Sheet

5) Document 00 45 00 List of Successful Projects

6) Document 00 45 10 Non-collusion Declaration: To be subscribed and sworn before a notary public.

7) Document 00 45 26 Joint Apprenticeship Committee Certification with attachment [JAC Letter or other evidence of JAC participation]

8) Document 00 45 27 Statement re No Apprenticeship Violation

9) Document 00 45 28 Acknowledgment Re: Health Care Expenditure Requirement

10) Document 00 45 46 Certification Against Lobbying-reserved

11) Document 00 62 20 Iran Contacting Act

12) Document 00 62 21 Fleet Compliance Certification

27. Envelopes will be opened in public following receipt of bids at 2:15pm on **October 24, 2024,** at Yolo County General Services Department-Procurement Division 120 West Main Street, Ste. C., Woodland, CA.95695.

28. The following documents are to be executed and submitted by apparent low Bidder after Bids have been opened and duly inspected. Failure to properly and timely submit these documents entitles the County to reject the bid as non-responsive.

(L) Submit the following documents to Procurement by 5:00 p.m. of the TENTH business day following NOTICE OF AWARD. Award of contract depends upon approval of State Department of Finance, Insurance Certificates and Endorsements, Document 00450 Contractor Information Form, and any required safety submittals.

1) Document 00 52 00 Construction Agreement: To be executed by successful Bidder. Submit two (2) copies, each bearing an original signature.

2) Document 00 61 00 Performance Bond: To be executed by successful Bidder and surety.

3) Document 00 62 00 Payment Bond: To be executed by successful bidder and surety.

4) Insurance Certificates and Endorsements required by Document 00 70 00 General Conditions Article 2

(M) Pursuant to Section 1777.5 (d) of the California Labor Code, the Apparent Low Bidder and each of its subcontractors who employ workers in any apprenticeable craft or trade shall employ apprentices in the ratio set forth in Section 1777.5 of the California Labor Code and shall apply to any apprenticeship program in the craft or trade that can provide apprentices to the site of the Project for a certificate approving the contractor (Apparent Low Bidder) and subcontractors under the apprenticeship standards for the employment and training of apprentices in the area or industry affected. The Apparent Low Bidder shall provide documentation of proof of compliance with applicable apprenticeship requirements upon request by the County. This requirement is in addition to the obligation to participate in the County's Joint Apprenticeship Committee requirement and Health Care Expenditure set forth in Section 00 12 00 'Notice to Bidders,' as well as 00 45 26, 00 45 27, and 00 45 28 in this Project Manual.

29. Any bid protest must be submitted in writing to Procurement before 5 p.m. of the FIFTH business day following the posting of the **Intent to Award** on Periscope (formerly Bid Sync).

(O) The initial protest document must contain a complete statement of the basis for the protest.

(P) The protest must refer to the specific portions of all documents, which form the basis for the protest.

(Q) The protest must include the name, address and telephone number of the person representing the protesting party.

(R) The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest. Such parties shall include all other Bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

(S) The County will issue a decision on the protest. If the County determines that a protest is frivolous, the party originating the protest may be determined to be irresponsible and that party may be determined to be ineligible for a future contract award.

(T) The procedure and time limits set forth in this paragraph are mandatory and are the Bidder's sole and exclusive remedy in the event of bid protest and failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.

30. The County reserves the right, acting in its sole discretion, to reject any or all Bids, including without limitation the right to reject any or all nonconforming, non-responsive, unbalanced or conditional Bids, re-bid, and to reject the Bid of any Bidder if the County believes that it would not be in the best interest of Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by the County. The County also reserves the right, acting in its sole discretion, to waive inconsequential or immaterial deviations not involving price, time or changes in the Work. For purposes of this paragraph, an "unbalanced bid" is one having nominal prices for some work items and enhanced prices for other work items.

31. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between written words and figures, or words and numerals, will be resolved in favor of the words.

32. In evaluating Bids, the County will consider the qualifications of Bidders, whether or not the Bids comply with the prescribed requirements, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award. The County may conduct such investigations as the County deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of Bidders, proposed subcontractors, suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to the County's satisfaction within the prescribed time.

33. Special attention is directed to contractors for Covid-19 precautions and requirements during construction. Refer to Section 01 10 00 Summary of Work for description of minimum requirements.

34. Special Requirements:

    A. The Contractor’s workers and equipment shall be limited to the work areas as designated by this contract. In the event the Contractor, his/her employees, or subcontractors fail to adhere to the County’s security provisions, the County has the right to deny access to the work site to that employee or subcontractor without an extension of time being granted to the Contractor.

    B. No smoking shall be allowed on construction site per County’s policy.

C. GENERAL PROJECT MANAGEMENT SOFTWARE

1. County has directed its Contractor to use the County's project management Software to track and manage the project. The County currently utilizes Trimble's E-Builder project management software.

2. Use of this project management software will not replace or change any Contractual responsibilities of the construction team members.

3. Each project team member of the Contractor: Superintendent, Project engineer, Scheduler and Project Manager, et al., shall have access to the Internet e-mail address in order to communicate with various project team members. The Contractor shall provide immediately upon receipt of Notice to Proceed confirmation of these conditions and the names, positions, and e-mail addresses to the County.

4. The Contractor is required to utilize the County's project management software for the pay application process. Unless otherwise directed or authorized in writing by the County or County's construction manager, all applications for payment and all supporting documents shall be in electronic format and submitted using the County's project management software.

SECTION 00 41 00

BID FORM

Project: Yolo County Ag Department Shops Buildings

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with the County of Yolo ("the County") in the form included in the Contract Documents, Document 00 52 00 Construction Agreement (Contract), to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Sum and within the Contract Time indicated in this Bid and in accordance with all other terms and conditions of Contract Documents.

2. Bidder accepts all of the terms and conditions of the Contract Documents and the Notice to Bidders, including without limitation, those dealing with the disposition of Bid security. Bidder will sign and submit the Agreement with Bonds and other documents required by Document 00 20 00 Instructions to Bidders, within ten (10) calendar days after receipt of the County's Notice of Award.

3. In submitting this Bid, Bidder represents:

   (a) Bidder has examined copies of all of the Contract Documents and of the following Addenda (receipt of all of which is hereby acknowledged).

Date	Number
_____	_____
_____	_____
_____	_____
_____	_____

   (b) Bidder has visited the site and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as built conditions, and all local conditions and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto;

(c) Bidder has examined thoroughly and understood all reports, drawings and/or reports, available for Bidding purposes and accepts the determination set forth in these documents and Document 00 70 00 General Conditions of the limited extent of the information contained in such reports and drawings upon which the Bidder may be entitled to rely. Bidder agrees that except for the information so identified, Bidder does not and shall not rely on any other information contained in such reports and drawings.

(d) Bidder has conducted or obtained and has understood all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in paragraph 3(c) above) which pertain to the subsurface conditions, as built conditions, Underground Facilities and all other physical conditions at or contiguous to the site or otherwise which may affect the cost, progress, performance or furnishing of Work, as Bidder considers necessary for the performance or furnishing of Work at the Contract Sum, within the Contract Time and in accordance with the other terms and conditions of Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by Bidder for such purposes;

(e) Bidder has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

(f) Bidder has given Project Manager prompt written notice of all conflicts, errors, ambiguities or discrepancies that it has discovered in or among the Contract Documents and as built and actual conditions and the written resolution thereof by Project Manager is acceptable to Bidder.

4. Based on the foregoing, Bidder proposes and agrees to fully perform the Work within the time stated and in strict accordance with the Contract Documents for the following sum of money listed in the following Bid Schedule:

(continued next page)

Bid Schedule

Yolo County Ag Department Shops Buildings

Contractor / Company: _____

***All line items on Bid Schedule form must be completed for valid bids.** The costs for any work shown or required in the Plans and Specifications, but not specifically identified as a line item are to be included in the related line items and no additional compensation shall be due to Contractor for the performance of the work.

Yolo County Ag Department Shops Buildings					
BID ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**	**UNIT**	**UNIT PRICE**	**NUMERICAL TOTAL**
	AG BUILDING				
1.	Mobilization & Demobilization	1	LS	$	$
2.	Concrete	1	LS	$	$
3.	Steel	1	LS	$	$
4.	Rough Carpentry	1	LS	$	$
5.	Casework	1	LS	$	$
6.	Insulation	1	LS	$	$
7.	Flashing & Sheet Metal	1	LS	$	$
8.	Joint Sealants	1	LS	$	$
9.	Doors/Frames/Hardware	1	LS	$	$
10.	Overhead Coil Doors	1	LS	$	$

Yolo County Ag Department Shops Buildings					
BID ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**	**UNIT**	**UNIT PRICE**	**NUMERICAL TOTAL**
11.	Glazing	1	LS	$	$
12.	Skylights	1	LS	$	$
13.	Gypsum Board Assemblies	1	LS	$	$
14.	Tiling	1	LS	$	$
15.	Acoustical Ceilings	1	LS	$	$
16.	Resin Flooring & Polished Concrete	1	LS	$	$
17.	Painting	1	LS	$	$
18.	Signage (Code required only)	1	LS	$	$
19.	Toilet Compartmenrts	1	LS	$	$
20.	Wall Protection	1	LS	$	$
21.	Toilet Accessories	1	LS	$	$
22.	Fire Protection Specialties	1	LS	$	$
23.	Lockers	1	LS	$	$
24.	Window Treatments	1	LS	$	$
25.	Pre-Engineered Metal Building	1	LS	**$**	**$**
26.	Fire Suppression	1	LS	**$**	**$**

Yolo County Ag Department Shops Buildings					
BID ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**	**UNIT**	**UNIT PRICE**	**NUMERICAL TOTAL**
27.	Plumbing	1	LS	$	$
28.	HVAC & Controls	1	LS	$	$
29.	Electrical	1	LS	$	$
30.	Communications	1	LS	$	$
	AG BUILDING SUBTOTAL			$	$
	SITE IMPROVEMENTS				
31.	Demo Existing Pavement/Signage/Wheel Stops	1	LS	$	$
32.	Excavation & Grading including any required Import or export or export to Balance the Site & exporting any unusable material	1	LS	$	$
33.	A.C. - PARKING LOT (4" A.C., 12")	3733	SF	$	$
34.	P.C.C. - ACCESS RAMP AND TRASH ENCLOSURE (6" P.C.C., 6" A.B.)	1400	SF	$	$
35.	P.C.C.-SIDEWALK (4 P.C.C., 4" A.B.)	1657	SF	$	$
36.	6" VERTICAL CURB	555	LF	$	$

Yolo County Ag Department Shops Buildings					
BID ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**	**UNIT**	**UNIT PRICE**	**NUMERICAL TOTAL**
37.	DEEPENED VERTICAL CURB/WALL	116	LF	$	$
38.	4' WIDE VALLEY GUTTER	479	SF	$	$
39.	8" PERFORATED STORM DRAIN	180	LF	$	$
40.	STORM DRAIN CATCH BASIN	2	EA	$	$
41.	1.5" WATER PIPE (COMMERCIAL, PVC C901)	9	LF	$	$
42.	6" WATER PIPE (FIRE, PVC C900)	15	LF	$	$
43.	6" SEWER (SDR-35)	15	LF	$	$
44.	TRUNCATED DOMES	129	SF	$	$
45.	WHEEL STOP (PRECAST CONCRETE)	23	EA	$	$
46.	6" THICK, 3/4" CRUSHED ROCK	3250	SF	$	$
47.	INFILTRATION TRENCH (2.5' WIDTH, 3' DEPTH)	180	LF	$	$
48.	FENCING AND GATES	1	LS	$	$
49.	SIGNING AND STRIPING	1	LS	$	$
50.	EROSION CONTROL IMPLEMENTATION AND MANAGEMENT	1	LS	$	$
51.	Landscape	1	LS	$	$
52.	Site Electrical	1	LS	$	$

Yolo County Ag Department Shops Buildings					
BID ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**	**UNIT**	**UNIT PRICE**	**NUMERICAL TOTAL**
53	Electrical Switchgear Screen Wall	1	LS		
	SITE IMPROVEMENT SUBTOTAL			**$**	**$**
	OFF-SITE IMPROVEMENTS				
54.	MOBILIZATION	1	LS	**$**	**$**
55.	TRAFFIC CONTROL AND PUBLIC SAFETY INCLUDING CONSTRUCTION SIGNING BARRICADES, ETC.	1	LS	**$**	**$**
56.	SAWCUT, REMOVE AND REPLACE EXISTING CURB, GUTTER, AND SIDEWALK	89	SF	**$**	**$**
57.	SAWCUT AND REMOVE EXISTING PAVING AND INSTALL 4" AC PAVING	260	SF	**$**	**$**
58.	1.5" BACKFLOW PREVENTION ASSEMBLY	1	EA	**$**	**$**
59.	1.5" WATER METER	1	EA	**$**	**$**
60.	1.5" WATER CONNECTION TO EXISTING MAIN	1	EA	**$**	**$**
61.	1.5" WATER PIPE	26	LF	**$**	**$**
62.	6" DOUBLE CHECK DETECTOR ASSEMBLY	1	EA	**$**	**$**
63.	6" WATER CONNECT TO EXISTING MAIN	1	EA	**$**	**$**

Yolo County Ag Department Shops Buildings					
BID ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**	**UNIT**	**UNIT PRICE**	**NUMERICAL TOTAL**
64.	6" WATER PIPE (PVC C900 CLASS 200)	26	LF	$	$
65.	6" WATER VALVE (GATE)	1	EA	$	$
66.	6" FIRE DEPARTMENT CONNECTION	1	EA	$	$
67.	6" SEWER CLEAN OUT	1	EA	$	$
68.	6" SEWER PIPE (SDR-35)	67	LF	$	$
69.	6" SEWER CONNECT TO MAIN	1	EA	$	$
	OFF-SITE IMPROVEMENT SUBTOTAL			$	$

CONTINUED ON NEXT PAGE
//

Construction Base Bid Total		
Ag Building **Bid Items 1-30 Total**	Numerical Total $	Written Total
Site Improvements **Bid Items 31-53 Total**	Numerical Total $	Written Total
Off-Site Improvements **Bid Items 54-69 Total**	Numerical Total $	Written Total
Grand Total All 3 Above Categories	Numerical Total $	Written Total

Company Name_____

By:_____

Signature_____**Date**_____

Base Bid Total Price for the
Yolo County Ag Department Shops Buildings_____

(written) **Dollars**

Enclosed find Bidder's Bond, certified check or cashier's check No._____of the

_____(Company/Bank), for $_____.

Dated this_____day of_____, 2024

5. Subcontractors are listed on the attached document 00 43 00, Subcontractors List.

6. The undersigned understands that the County reserves the right to reject this Bid, but that this Bid shall remain open and shall not be withdrawn for a period of ninety (90) calendar days from the date prescribed for its opening (to accommodate State financing process).

7. If written notice of the acceptance of this Bid, hereinafter referred to as Notice of Award, is mailed or delivered to the Undersigned within the stipulated time after the date set for the opening of this Bid, or at any other time thereafter before it is withdrawn, the undersigned will execute and deliver the documents required by Document 00 20 00 Instructions to Bidders including, but not limited to, Document 00 52 00 Construction Agreement, Document 00 61 00 Performance Bond, and Document 00 62 00 Payment Bond and Escrow Bid Documents, all within ten (10) calendar days after personal delivery or after receipt in the mails of the Notice of Award.

8. Notice of Award or request for additional information may be addressed to the undersigned at the address set forth below.

9. The undersigned herewith encloses a cash, cashier's check, certified check or corporate surety bond in the amount of ten percent (10%) of the total of Bid Items and made payable to: County of Yolo and is subject to all conditions imposed by law.

10. The undersigned agrees to commence work under this Contract on the date established and to complete all work within the time specified in Document 00 52 00 (Construction Agreement).

11. The undersigned agrees that, in accordance with Document 00 70 00 General Conditions liquidated damages for failure to complete all work in the contract within the time specified are as set forth in Document 00 52 00 (Construction Agreement).

12. The undersigned herewith encloses the completed Bidder's Bond – 00 42 00.

13. The undersigned herewith encloses the completed Subcontractors List – 00 43 00.

14. The undersigned herewith encloses the completed Bidder Information Sheet – 00 44 00.

15. The undersigned herewith encloses the completed List of Successful Projects form – 00 45 00.

16. The undersigned herewith encloses the completed Non-Collusion Declaration – 00 45 10.

17. The undersigned herewith encloses the completed Joint Apprenticeship Committee Certification– 00 45 26.

18. The undersigned herewith encloses the completed Statement re No Apprenticeship Violation – 00 45 27.

19. The undersigned herewith encloses the completed Acknowledgment re: Health Care Expenditure Requirement – 00 45 28.

20. The undersigned herewith encloses the completed Certification Against Lobbying – 00 45 46. (reserved)

21. The undersigned herewith encloses the completed Iran Contracting Act-00 62 20. (reserved).

22. The undersigned herewith encloses the completed Document 00 62 21 Fleet Compliance Certification.

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23) The names of all persons interested in the foregoing Bid as principals are:

_____

_____

_____

_____

(IMPORTANT NOTICE: If Bidder or other interested person is a corporation, give the legal name of corporation, state where incorporated, and names of president and secretary thereof; if a partnership, give name of the firm and names of all individual co-partners composing the firm; if Bidder or other interested person is an individual, give first and last names in full).

Name of Bidder: _____
Legal Name of Corporation or Firm

CA Contractor's License No. _____

DIR Registration No. _____

Business Address _____

_____

Email Address _____

Telephone Number _____

Date of Bid _____

_____
Signature of Bidder (Authorized to sign contracts on behalf of the Corporation or Firm)

_____
Printed Name

_____
Title

SECTION 00 42 00

COUNTY OF YOLO BIDDER'S BOND

We, _____ as Principal, and

_____ as Surety, are bound unto THE COUNTY OF YOLO as Owner (Obligee), in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, jointly and severally,

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal is submitting a bid to the Obligee, for the **Yolo County Ag Department Shops Buildings** for which bids are to be opened in public at the **General Services Department, Procurement Division 120 West Main Street, Ste C, Woodland, CA 95695.**

NOW THEREFORE, if Principal is awarded the Contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two bonds with the Obligee, one to guarantee faithful performance of the contract and the other to guarantee payment for labor and materials, as required by law, then this obligation shall be null and void; otherwise it shall remain in full force.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including reasonable attorney's fees to be fixed by the Court.

Dated: _____ _____

_____
Principal

_____
Surety

By: _____
Attorney-in-Fact

ADDRESS OF SURETY FOR SERVICE OF NOTICE:

_____

_____

_____

NOTE: Signature of those executing for the Surety shall be properly acknowledged and accompanied by a Certificate of Acknowledgement

SECTION 00 43 00

SUBCONTRACTOR LIST

YYolo County Ag Department Shops Buildings. The General Contractor shall list below all subcontractors who will be performing categories of work in excess of one- half (1/2) of one percent (1%) of the General Contractor's total bid price. All work not covered within the following list will be performed directly by the General Contractor. Yolo County will follow public contract Code Section 4104, where bids submitted must contain at least the Subcontractors; name, location of the place of business, CSLB No., DIR No., and type of work to be performed. The County will allow the other required information about the subcontractor to be submitted up to 24 hours after the bid submittal deadline. Copy to use additional forms as necessary.

WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO.	CA LICENSE TYPE AND NO.	MAILING ADDRESS	PHONE NUMBER

SECTION 00 44 00

BIDDER INFORMATION SHEET

The Bidder must check one of the following classifications that fit its type of business organization and furnish all information required under that classification.

Please type or print your answers.
Attach a copy of license(s) upon which you intend to rely.

_____

( ) BIDDER IS A CORPORATION

The full name of the corporation as it appears on the State Contractor's License is:

_____

Corporation is incorporated in the State of:

_____

( ) BIDDER IS AN INDIVIDUAL

Bidder's name as it appears on State Contractor's License is:

_____

( ) BIDDER IS A PARTNERSHIP

Bidder's firm name, individual or partnership, as it appears on State Contractor's License is:

The full names of all partners as they appear on State Contractor's License are:

_____

_____

County in which any Certificate of Doing Business Under Fictitious Name is filed – (If none, so state):

_____

Accompanying this proposal is _____ (NOTICE: INSERT THE WORDS "CASH ($_____)", "CASHIER'S CHECK", "CERTIFIED CHECK", OR "BIDDER'S BOND", AS THE CASE MAY BE) in amount equal to at least ten (10) percent of the total of the Bid.

The names of all persons interested in the forgoing proposal as principals are as follows:

IMPORTANT NOTICE**:** If the Bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and executive officer thereof; if a partnership, state name of partnership, also names of all individual partners; if Bidder or other interested person is an individual, state first and last names in full.

_____

_____

_____

Licensed in accordance with an act providing for the registration of contractors,

License No. _____ Classifications(s) _____
(A copy of the afore-referenced license must be supplied at Notice of Award.)

ADDENDA: This Proposal is submitted with respect to the changes to the Contract included in addenda number/s

_____

(Fill in addenda numbers if addendas have been received and insert, in this proposal, any Engineer's Estimate sheets that were received as part of the addenda)

CERTIFICATION OF BIDDER FOR PROPOSAL:

By my signature on this Proposal I certify, under penalty of perjury under the laws of the State of California, that the foregoing questionnaire and statements of Public Contract Code are true and correct. By my signature on this proposal I further certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Non-collusion Declaration required by Public Contract Code Section 7106 and Part 24 Debarment and Suspension Certification are true and correct.

The person or persons executing this proposal on behalf of a corporation or a member of partnership, shall be prepared to demonstrate by resolution, article, or otherwise, that such person is or that such persons are appropriately authorized to act in these regards for such corporation or partnership. Such authority shall be demonstrated to the satisfaction of the County of Yolo.

If the signature is by an agent other than an officer of a corporation or a member of a partnership, a power of attorney authorizing said act by the agent on behalf of his principal shall be submitted with the bid forms, otherwise the Bid may be disregarded as irregular and unauthorized.

The Bidder's execution on the signature portion of this Proposal shall constitute an endorsement and execution of those affidavits, declarations and certifications which are of this Proposal.

Executed this_____ day of _____ at _____, California.

Sign Here: _____

by

_____
Name and Title of Bidder

SECTION 00 45 00

LIST OF SUCCESSFUL PROJECTS

Bidders must have experience in new construction and bidders must list below a minimum of five similar projects of not less than 50% of the total work scope of this project and within the last eight years.

Bidder name:_____

	Project Location	Project Description	Contract Dollar Amount	Name and Phone # of Owner's Representative
1				
2				
3				
4				
5				

SECTION 00 45 10

NON-COLLUSION DECLARATION

Non-Collusion Declaration To Be Executed By Bidder and Submitted with Bid
(Public Contract Code Section 7106)

State of California)
) ss.
County of Yolo)

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____[date], at _____[city], _____[state].

Name of Bidder_____

Signature_____

Name and Title_____

Dated_____

Note: Bidders are cautioned that making a false certification may subject the bidder to criminal prosecution

SECTION 00 45 26

JOINT APPRENTICESHIP COMMITTEE PARTICIPATION CERTIFICATION

The County has adopted a Joint Apprenticeship Committee (JAC) participation requirement for certain public projects estimated to cost more than one-million dollars ($1,000,000). A JAC means an apprenticeship program comprised of an equal number of employer and employee representatives approved by the State of California Division of Apprenticeship Standards. This JAC requirement is in addition to the apprenticeship requirements of the Prevailing Wage Laws.

To satisfy the County's JAC participation requirement, Contractors must submit evidence satisfactory to the Procurement Manager or the Procurement Manager's designee that they participate in a JAC by being a signatory to a JAC or employ registered apprentices dispatched by a JAC. Such evidence may be in the form of a signed letter from a JAC confirming the Contractor is a signatory to a JAC or has hired registered apprentices who are active participants of a JAC.

By signing below, Contractor acknowledges the County's JAC participation requirement and certifies that it satisfies this requirement. Failure to submit this form and attach evidence of compliance with this requirement shall result in a determination that the bid is non-responsive.

Name of Contractor Submitting Bid: _____

Signature: _____

Name and Title: _____

Date: _____

Occupation(s)/Trade(s)/Craft(s):

_____

_____

Name of JAC: _____

Include Attachment – JAC Letter or other evidence of JAC participation

SECTION 00 45 27

STATEMENT RE NO APPRENTICESHIP VIOLATION

I am the _____ of _____
[Title] [Contractor]

and I am authorized to make this statement on Contractor's behalf.

During the past three (3) years, Contractor has not been found in violation of any provision of State or local apprenticeship laws or regulations.

Signature: _____

Printed Name: _____

Date: _____

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SECTION 00 45 28

ACKNOWLEDGMENT RE: HEALTH CARE EXPENDITURE REQUIREMENT

As set forth in the County's Policy on Procurement, the County has adopted the following requirement regarding Health Care Expenditures for certain public projects estimated to cost more than one million dollars ($1,000,000):

> Each Contractor with construction craft employees shall make health care expenditures for each such employee in an amount per hour worked on the Covered Project equivalent to at least the hourly pro rata cost of a Covered California Platinum level plan for two 40-year-old adults and two dependents 0 to 14 years of age for the Covered California rating area in which the development is located. Qualifying expenditures shall be credited toward compliance with prevailing wage payment requirements up to the amount determined by the Director of Industrial Relations pursuant to Sections 1773 and 1773.9 of the Labor Code. Health care expenditures in excess of that amount shall not be so credited. "Health care expenditures" include contributions under Sections 501(c) or (d) or 401(a) of the Internal Revenue Code and payments toward "medical care" as defined under Section 213(d)(1) of the Internal Revenue Code. A Contractor that is signatory to a valid collective bargaining agreement that requires payment of at least the prevailing wage, participation in a joint labor-management apprenticeship program, and the provision of health care payments for all construction craft employees shall be deemed in compliance. A Contractor without construction craft employees shall show a contractual obligation that its subcontractors comply with this paragraph.

The Project is a "Covered Project" and subject to this health care expenditure requirement.

By signing below, Contractor acknowledges that Contractor has read and will comply with this health care expenditure requirement or, alternatively, that Contractor is a signatory to a valid collective bargaining agreement, which requires payment of at least the prevailing wage, participation in join labor-management apprenticeship program, and the provision of health care payments for all construction craft employees.

Failure to submit this acknowledgment form shall result in a determination that the bid is non-responsive.

Name of Contractor Submitting Bid: _____

Signature: _____

Name and Title: _____

Date: _____

SECTION 00 51 00

NOTICE OF AWARD

Dated: xxxxxxx, 2024

TO: xxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxx

COUNTY OF YOLO PROJECT:
Bid No. **01**

ADDRESS: xxxxxxxxxxxxxx
xxxxxxxxxxxxxx

PROJECT: **Yolo County Ag Department Shops Building.**

COUNTY OF YOLO CONTRACT

CONTRACT FOR: **Yolo County Ag Department Shops Building.**

The Contract Price of your contract is **xxxxxxxxxxxxxxxxxxxxxxxxxxxx** Dollars ($xxxxxxxxxxxx).

Two copies of each of the proposed Contract Documents (except Drawings) accompany this Notice of Award. Three sets of the Drawings will be delivered separately or otherwise made available to you immediately.

Upon receipt of this Notice of Award, you and each of your subcontractors who employ workers in any apprenticable craft or trade, shall apply to the joint apprenticeship committee administering the apprenticeship standards of the craft or trade for a certificate approving you and your subcontractors under the apprenticeship standards for the employment and training of apprentices, pursuant to section 1777.5 of the California Labor Code.

Upon commencement of the work, you and each of your subcontractors shall certify and make available for inspection payroll records on forms provided by the Division of Labor Standards Enforcement, pursuant to section 1776 of the California Labor Code.

You must comply with the following conditions precedent within ten calendar days of the date of this Notice of Award, that is by xxxxxxxxxxxxxxxxxxx, 2024.

1. You must deliver to the County two fully executed counterparts of the Construction Agreement (Document 00 52 00). Each of the Contract Documents must bear your signature on the cover page.

2. You must deliver to the County the Contract Performance Bond (Document 00 61 00) and Payment Bond (Document 00 62 00).

3. You must deliver to the County Certificates of Insurance for amounts specified.

Failure to comply with these conditions within the time specified will entitle the County to consider your bid abandoned, to annul this Notice of Award and to declare your Bid Security forfeited.

Within ten days after you comply with those conditions, the County will return to you one fully signed counterpart of the Contract with the Contract Documents attached.

County of Yolo

BY: _____

Chris Rice

Project Manager
Yolo County General Services Department

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SECTION 00 52 00

COUNTY OF YOLO, CALIFORNIA

CONSTRUCTION AGREEMENT FOR
Yolo County Ag Department Shops Building

120 West Main Street Woodland, CA 95695 right outside of Ste. C

CONTRACT NO. _____

This Agreement for Construction ("Agreement" or "Contract") is between _____, a California _____ ("Contractor"), and the County of Yolo ("County"), a political subdivision of the State of California.

1. SCOPE OF WORK. Contractor shall furnish all labor, services, transportation, materials, equipment, parts, and supplies necessary for the **Yolo County Ag Department Shops Building ("the Project")** in strict accordance with the Project plans and specifications and Contract Documents. Contractor shall complete the Project per the Bid Schedule, not to exceed $__ ("Contract Price").

2. CONTRACT DOCUMENTS. The following documents defined as the "Contract Documents" in Section 1.12 of the General Conditions, are incorporated as if fully set forth herein by this reference and comprise the entire Agreement between the County and Contractor concerning the Project.

Proposal Response, including all required forms
Subcontractor List
Project Manual, Vol. I, Bidding and Contracting Requirements
Project Manual, Vol. II, Technical Specifications and Drawings
Performance Bond and Payment Bond
General Conditions
Notice to Bidders
Notice to Proceed
Project Plans and Specifications
Addendas
Change Orders Issued by the County

All of the Contract Documents are intended to be complementary. Work required by one of the Contract Documents and not by others shall be done as if required by all. In the event of a conflict, the various Contract Documents will be given effect in the order set forth in the General Conditions (Sections 4.02 and 20.08). In the event of any remaining conflict, the provision that requires the highest level of performance from Contractor for the County's benefit shall prevail.

3. CONDUCT OF WORK, CONTRACT ADMINISTRATOR. Contractor shall perform the services described in the Contract Documents in a in a good, workmanlike and substantial manner and to the satisfaction of the County and in a manner that causes the least possible inconvenience to County and the public and safeguards persons and property from any dangerous activities or conditions conducted or created by Contractor. County's Chief Deputy County Administration Officer shall administer this Agreement for County. County's Board of Supervisors may designate a different person to serve as Contract Administrator by giving advance written notice to Contractor.

(a) Work Schedule. Unless otherwise agreed pursuant to Section 3.01 of the General Conditions, Contractor shall begin work within ten (10) calendar days after receiving the Contract Administrator's Notice to Proceed and shall complete the work within **548 calendar days** after receiving that notice, followed by a 90 day maintenance period This work must be complete, operational, and be accepted by the County for its intended use for this milestone to be deemed complete.

(b) Liquidated Damages. Contractor shall pay County $400.00 a day liquidated damages for each day's delay (excluding Saturdays, Sundays, and County observed holidays) in completing the work beyond the time specified for completion of work. All other aspects of the payment of such damages shall be governed by Section 3.12 of the General Conditions and other relevant provisions thereof. The assessment of liquidated damages is not a penalty but considered to be a reasonable estimate of the amount of damages County will suffer by delay in completion of the Project. The County is entitled to set off the amount of liquidated damages assessed against any payments otherwise due to Contractor, including, but not limited to, setoff against release of retention. If the total amount of liquidated damages assessed exceeds the amount of unreleased retention, County is entitled to recover the balance from Contractor or its sureties. Use of the Project in whole or in part prior to substantial completion, shall not operate as a waiver of County's right to assess liquidated damages.

4. INDEMNIFICATION. With the exception that this section shall in no event be construed to require indemnification by Contractor to a greater extent than permitted under the public policy of the State of California, Contractor shall provide indemnification and defense of the County as set forth in the General Conditions (see sections 2.05 and 2.06 of the General Conditions) and Section 00 62 10 of the Project Manual.

Responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnification obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement. In providing any defense under the Contract Documents, Contractor shall use counsel reasonably acceptable to the County.

5. COMPENSATION; PREVAILING WAGE. The County shall pay to the Contractor as full compensation for the performance of this Agreement the Contract Price, subject to any additions or deductions as provided in the Contract Documents. All matters of compensation and payment shall be governed by the General Conditions, including but not limited to Article 25 thereof, provided, however that the total compensation to be paid by County to Contractor shall not

exceed the Contract Price. The statement of prevailing wages appearing in the General Prevailing Wage Rate Determinations of the Director of the State of California Department of Industrial Relations are incorporated herein by reference. When two rates differ for similar kinds of labor, Contractor shall pay not less than the higher rate. Contractor shall bear all risks of payment or non-payment of prevailing wages under California law, and Contractor hereby agrees to defend, indemnify, and hold the County, its officials, officers, employees, agents and volunteers, free and harmless from any claim or liability arising out of any failure or alleged failure to comply with the prevailing wage laws.

6. INSURANCE. Contractor shall maintain the insurance required by the General Conditions and the following insurance while performing the work covered by this Agreement. The comprehensive general liability insurance shall include broad form property damage insurance.

(a) Minimum Coverages (as applicable) - Insurance coverage shall be with limits not less than the following:

1. **Commercial General Liability** Occurrence form Insurance policy (ISO CG 00 01 or equivalent) covering all operations by or on behalf of Contractor, including coverage for:

   a) Premises and Operations

   b) Products and completed Operations

   c) Contractual Liability insuring the obligations assumed by Contractor in this agreement or Blanket Contractual Liability Coverage

   d) Broad Form Property Damage (including Completed Operations)

   e) Explosion, Collapse, and Underground Hazards

   f) Personal Injury Liability

   Limits of liability shall be not less than:

   $5,000,000 each occurrence (combined single limit for bodily injury and property damage)

   $5,000,000 for Personal Injury Liability

   $5,000,000 for Products Completed Operations

   $10,000,000 General Aggregate

   If the policy does not have an endorsement providing that the General Aggregate Limit applies separately, or if defense costs are included in the aggregate limits, then the required aggregate limits shall be $10,000,000.

2. **Automobile Liability** – Insurance policy (ISO CA 00 01) covering Bodily Injury, Property Damage and contractual Liability coverage for "Any Auto" which includes coverage for any owned, hired, borrowed and non-owned automobile, trailer, and equipment coverage, with limits no less than $1,000,000 occurrence (per accident for bodily injury and property damage) and $2,000,000 policy aggregate.

3. **Workers' Compensation** – Statutory Limits/**Employers' Liability** – No less than $1,000,000 per accident for bodily injury or disease.

4. **Builder's Risk** – (Course of Construction) insurance utilizing an "All Risk" (Special Perils) coverage form, with limits equal to the completed value of the project and no coinsurance penalty provisions.

5. **Contractor's Pollution Legal Liability Insurance** – Limits of no less than $2,000,000 per occurrence or claim, and $2,000,000 policy aggregate.

(b) The County, its officers, agents, employees and volunteers shall be named as additional insured on all but the workers' compensation and professional liability coverages. **[NOTE: Evidence of additional insured may be needed as a separate endorsement due to wording on the certificate negating any additional writing in the description box.]** It shall be a requirement under this agreement that any available insurance proceeds broader than or in excess of the specified minimum Insurance coverage requirements and/or limits shall be available to the Additional Insured. Furthermore, the requirements for coverage and limits shall be (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any Insurance policy or proceeds available to the named Insured; whichever is greater.

1. The Additional Insured coverage under the Contractor's policy shall be "primary and non-contributory" and will not seek contribution from the County's insurance or self-insurance and shall be at least as broad as CG 20 01 04 13.

2. The limits of Insurance required in this agreement may be satisfied by a combination of primary and umbrella or excess Insurance. Any umbrella or excess Insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and non-contributory basis for the benefit of the County of Yolo (if agreed to in a written contract or agreement) before the County's own Insurance or self-insurance shall be called upon to protect it as a named insured.

3. Said policies shall remain in force through the life of this Agreement and, with the exception of professional liability coverage, shall be payable on a "per occurrence" basis unless the County Risk Manager specifically consents in writing to a "claims made" basis. For all "claims made" coverage, in the event that the Contractor changes insurance carriers Contractor shall purchase "tail" coverage covering the term of this Agreement and not less than three years thereafter. Proof of such "tail" coverage shall be required at any time that the Contractor changes to a new carrier prior to receipt of any payments due.

4. The Contractor shall declare all aggregate limits on the coverage before commencing performance of this Agreement, and the County's Risk Manager reserves the right to require higher aggregate limits to ensure that the coverage limits required for this Agreement as set forth above are available throughout the performance of this Agreement.

5. Any deductibles or self-insured retentions must be declared to and are subject to the approval of the County Risk Manager. All self-insured retentions (SIR) must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied either by the named Insured or Yolo County.

6. Each insurance policy shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the Director (ten (10) days for delinquent insurance premium payments).

7. Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII, unless otherwise approved by the County Risk Manager.

8. The policies shall cover all activities of Contractor, its officers, employees, agents and volunteers arising out of or in connection with this Agreement.

9. For any claims relating to this Agreement, the Contractor's insurance coverage shall be primary, including as respects the County, its officers, agents, employees and volunteers. Any maintained by the County shall apply in excess of, and not contribute with, insurance provided by Contractor's liability insurance policy.

10. The insurer shall waive all rights of subrogation against the County, its officers, employees, agents and volunteers.

(c) Prior to commencing services pursuant to this Agreement, Contractor shall furnish the County with original endorsements reflecting coverage required by this Agreement. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. All endorsements are to be received by, and are subject to the approval of, the County Risk Manager before work commences. Upon County's request, Contractor shall provide complete, certified copies of all required insurance policies, including endorsements reflecting the coverage required by these specifications.

(d) During the term of this Agreement, Contractor shall furnish the County with original endorsements reflecting renewals, changes in insurance companies and any other documents reflecting the maintenance of the required coverage throughout the entire term of this Agreement. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. Upon County's request, Contractor shall provide complete, certified copies of all required insurance policies, including endorsements reflecting the coverage required by these specifications. Yolo County reserves the right to obtain a full certified copy of any Insurance policy and endorsements. Failure to exercise this right shall not constitute a waiver of right to exercise later.

(e) Contractor agrees to include with all Subcontractors in their subcontract the same requirements and provisions of this agreement including the indemnity and Insurance requirements to the extent they apply to the scope of the Subcontractor's work. Subcontracts in excess of one million dollars shall comply with the same insurance requirements as the general contractor. Adjustments will be considered by the County based upon the subcontractors scope of work for amounts under one million dollars. Subcontractors hired by Contractor agree to be bound to Contractor and the County of Yolo in the same manner and to the same extent as Contractor is bound to the County of Yolo under the Contract Documents. Subcontractor further agrees to include these same provisions with any Sub-subcontractor. A copy of the Owner Contract Document Indemnity and Insurance provisions will be furnished to the Subcontractor upon request. Contractor shall require all Subcontractors to provide a valid certificate of insurance and the required endorsements included in the agreement prior to commencement of any work and Contractor will provide proof of compliance to the County of Yolo.

(f) Contractor shall maintain insurance as required by this contract to the fullest amount allowed by law and shall maintain insurance for a minimum of five years following the completion of this project. In the event Contractor fails to obtain or maintain completed operations coverage as required by this agreement, the County at its sole discretion may purchase the coverage required and the cost will be paid by Contractor.

7. COMPLIANCE WITH LAWS.

(a) Contractor shall comply with all relevant federal, state, and local statutes, regulations, ordinances, rules, orders, and other laws in effect when performing the services required by this Agreement, all as set forth in the General Conditions (including but not limited to Article 20 thereof), and including, but not limited to, the provisions of the California Labor Code and California Public Contract Code that are applicable to this Project.

(b) By its signature hereunder, Contractor further certifies that it is aware of the provisions of Section 3700 of the Labor Code et seq. which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and Contractor will comply with such provisions before commencing the performance of the work of this contract.

(c) Contractor further represents and warrants that it is eligible to work on the Project pursuant to Labor Code Sections 1777.1 and 1777.7 and other applicable provisions of law. Further, Contractor acknowledges that it is prohibited from performing work on the Project with a subcontractor who is ineligible to perform work on public works project pursuant to Labor Code Sections 1777.1 and 1777.7.

8. INDEPENDENT CONTRACTOR. While performing the services required by this Agreement for Construction, Contractor shall act as an independent contractor, not as an employee of County, and thus shall be subject to the direction and control of County only for the final result. Contractor shall be solely responsible for paying all required employment taxes and for meeting all employment obligations related to its performance of the services, including but not limited to payment of worker's compensation, liability insurance, social security taxes (i.e., FICA), and tax withholding. Moreover, Contractor shall indemnify, defend (upon County's written request), and protect County from any liability County may incur to federal or state governments for such taxes and obligations. This Agreement does not entitle Contractor or its officers, employees, subcontractors, or agents to vacation pay, sick leave, retirement benefits, disability or unemployment insurance, or employee benefits of any kind from County.

9. INSPECTIONS. All inspections and any remedial action required in response thereto shall be governed by the General Conditions, including but not limited to Article 18 thereof.

10. PERFORMANCE AND PAYMENT BONDS. Within the time set forth in the Proposal and before performing any services pursuant to this Agreement, Contractor shall provide to County the bonds required by the General Conditions, including but not limited to Article 2 thereof. All other matters relating to bonds shall be governed by the General Conditions.

11. TERM OF AGREEMENT; EARLY TERMINATION. The term and termination of this Agreement shall be governed by the General Conditions, including but not limited to Article 27 thereof.

12. GUARANTY. Guarantees and warranties shall be governed by the General Conditions, including but not limited to Article 26 thereof.

13. AUDIT PROVISIONS. Contractor's records which shall include but not limited to accounting records, subcontract files, correspondence, change order files, and any other supporting evidence necessary to substantiate charges relating to this contact (all the foregoing hereinafter referred to as "records") shall be open to inspection and subject to audit and/or reproduction, during normal working hours, by County's agent or its authorized representative to the extent necessary to adequately permit evaluation and verification of any invoices, payments, or claims submitted by the contractor or any of his payees pursuant to the execution of this Agreement. For the purpose of such audits, inspections, examination, and evaluations, the County's agent or authorized representative shall have access to said records from the effective date of this Agreement, for the duration of the work, and until six years after the date of final payment by County to Contractor pursuant to this Agreement.

14. PROCEDURE FOR RESOLVING CLAIMS.

Contractor shall timely comply with any and all requirement of the Contract Documents pertaining to notices and requests for changes to the Contract Time or Contract Price as a prerequisite to filing any claim governed by this Section. The failure to timely submit a notice of delay or notice of change, or to timely request a change to the time for completion or Contractor's compensation, or to timely provide any other notice or request required herein shall constitute a waiver of the right to further pursue the claim under the Contract or at law. This claim resolution procedure shall control over any conflicting claim or dispute resolution procedure in the Contract Documents.

(a) Intent. Effective January 1, 1991, Section 20104 et seq., of the California Public Contract Code prescribes a process utilizing informal conferences, non-binding judicial supervised mediation, and judicial arbitration to resolve disputes on construction claims of $375,000 or less. Effective January 1, 2017, Section 9204 of the Public Contract Code prescribes a process for negotiation and mediation to resolve disputes on construction claims. The intent of this Section is to implement Sections 20104 et seq. and Section 9204 of the California Public Contract Code. This Section shall be construed to be consistent with all applicable law, including but not limited to these statutes.

(b) Claims. For purposes of this Section, "Claim" means a separate demand by the Contractor for:

i. An adjustment to the time for completion including, without limitation, for relief from damages or penalties for delay assessed by the County;
ii. Payment by the County of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract, payment for which is not otherwise expressly provided or to which the Contractor is not otherwise entitled; or
iii. An amount the payment of which is disputed by the County.

A "Claim" does not include any demand for payment for which the CONTRACTOR has failed to provide notice, request a Contract Change Order, or otherwise failed to follow any procedures contained in the Contract Documents.

(c) Filing Claims. Claims governed by this Section may not be filed unless and until the Contractor completes any and all requirements of the Contract Documents pertaining to notices and requests for changes to the Contract Price or Contract Time, and Contractor's request for a change has been denied in whole or in part. Claims governed by this Section must be filed no later than fourteen (14) days after a request for change has been denied in whole or in part or after any other event giving rise to the Claim. The Claim shall be submitted in writing to the County and shall include on its first page the following words in

16 point capital font: "THIS IS A CLAIM." The Claim shall include all information and documents necessary to substantiate the Claim, including but not limited to those identified below. Nothing in this Section is intended to extend the time limit or supersede notice requirements otherwise provided by Contract Documents. Failure to follow such contractual requirements shall bar any Claims or subsequent proceedings for compensation or payment thereon.

(d) Documentation. The Contractor shall submit all Claims in the following format:

i. Summary description of Claim including basis of entitlement, merit and amount of time or money requested, with specific reference to the Contract Documents provisions pursuant to which the Claim is made

ii. List of documents relating to Claim:
    i. Specifications
    ii. Drawings
    iii. Clarifications (Requests for Information)
    iv. Schedules
    v. Other

iii. Chronology of events and correspondence

iv. Narrative analysis of Claim merit

v. Analysis of Claim cost, including calculations and supporting documents

vi. Time impact analysis in the form required by the Contract Documents, if the Contract Documents do not require a particular format, CPM format, if an adjustment of the Contract Time is requested.

(e) County's Response. Upon receipt of a Claim pursuant to this Section, the County shall conduct a reasonable review of the Claim and, within a period not to exceed forty-five (45) days, shall provide the Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed. Any payment due on an undisputed portion of the Claim will be processed and made within sixty (60) days after the County issues its written statement.

i. If the County needs approval from its governing body to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the Claim, and the County's governing body does not meet within the forty-five (45) days or within the mutually agreed to extension of time following receipt of a Claim sent by registered mail or certified mail, return receipt requested, the County shall have up to three (3) days following the next duly publicly noticed meeting of the County's governing body after the forty-five (45) day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.

ii. Within thirty (30) days of receipt of a Claim, the County may request in writing additional documentation supporting the Claim or relating to defenses or Claims the County may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual

agreement of the County and the Contractor. The County's written response to the Claim, as further documented, shall be submitted to the Contractor within thirty (30) days (if the Claim is less than $50,000, within fifteen (15) days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

(f) Meet and Confer. If the Contractor disputes the County's written response, or the County fails to respond within the time prescribed, the Contractor may so notify the County, in writing, either within fifteen (15) DAYS of receipt of the County's response or within fifteen (15) days of the County's failure to respond within the time prescribed, respectively, and demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand, the County shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

(g) Mediation. Within ten (10) business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the County shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the County issues its written statement. Any disputed portion of the Claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the County and the Contractor sharing the associated costs equally. The County and Contractor shall mutually agree to a mediator within ten (10) business days after the disputed portion of the Claim has been identified in writing, unless the parties agree to select a mediator at a later time.

i. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

ii. For purposes of this Section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this Section.

iii. Unless otherwise agreed to by the County and the Contractor in writing, the mediation conducted pursuant to this Section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

iv. The mediation shall be held no earlier than the date the Contractor completes the Work or the date that the Contractor last performs Work, whichever is earlier. All unresolved Claims shall be considered jointly in a single mediation, unless a new unrelated Claim arises after mediation is completed.

(h) Procedures After Mediation. If following the mediation, the Claim or any portion remains in dispute, the Contractor must file a Claim pursuant to Chapter 1 (commencing with

Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code prior to initiating litigation. For purposes of those provisions, the running of the period of time within which a Claim must be filed shall be tolled from the time the Contractor submits his or her written Claim pursuant to subdivision (a) until the time the Claim is denied, including any period of time utilized by the meet and confer conference.

(i) Civil Actions. The following procedures are established for all civil actions filed to resolve Claims of $375,000 or less:

i. Within sixty (60) days, but no earlier than thirty (30) days, following the filing or responsive pleadings, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties or unless mediation was held prior to commencement of the action in accordance with Public Contract Code section 9204 and the terms of this Contract. The mediation process shall provide for the selection within fifteen (15) days by both parties of a disinterested third person as mediator, shall be commenced within thirty (30) days of the submittal, and shall be concluded within fifteen (15) days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court.

ii. If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1114.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration. In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, (A) arbitrators shall, when possible, be experienced in construction law, and (B) any party appealing an arbitration award who does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, also pay the attorney's fees on appeal of the other party.

(j) Government Code Claim Procedures.

i. This Section does not apply to tort claims and nothing in this Section is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commending with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.5 of Title 1 of the Government Code.

ii. In addition to any and all requirements of the C pertaining to Contract Documents notices of and requests for adjustment to the Contract Time, Contract Price, or compensation or payment for extra work, disputed Work, construction claims and/or changed conditions, the Contractor must comply with the claim procedures set forth in Government Code Section 900, et seq. prior to filing any lawsuit against the County.

iii. Such Government Code claims and any subsequent lawsuit based upon the Government Code claims shall be limited to those matters that remain unresolved

after all procedures pertaining to adjustment of the Contract Time or Contract Work for extra work, disputed work, construction claims, and/or changed conditions have been followed by Contractor. If Contractor does not comply with the Government Code claim procedure or the prerequisite contractual requirements, Contractor may not file any action against the County.

iv. **A Government Code claim must be filed no earlier than the date the Work is completed or the date the Contractor last performs Work on the Project, whichever occurs first. A Government Code claim shall be inclusive of all unresolved claims known to Contractor or that should reasonably by known to Contractor excepting only new unrelated Claims that arise after the Government Code claim is submitted.**

(k) Non-Waiver. The County's failure to respond to a Claim from the Contractor within the time periods described in this Section or to otherwise meet the time requirements of this Section shall result in the Claim being deemed rejected in its entirety and shall not constitute a waiver of any rights under this Section.

15. MISCELLANEOUS.

(a) Notice. Except as provided in Section 6, all correspondence regarding this Agreement, including invoices, payments, and notices, shall be directed to the following persons at the following addresses and phone number:

County:
Ryan Pistochini
Director, Yolo County General Services Department
120 West Main Street, Ste C
Woodland, CA 95695
Telephone: (530) 406-8005

Contractor:

_____

_____

_____

Telephone: _____

If written, correspondence shall be sent by personal delivery (including overnight delivery service); by U.S. Mail, postage prepaid; or by fax during business hours. Notices must be actually received to be effective.

(b) Time of Essence. Time is of the essence of this Agreement.

(c) Interpretation and Jurisdiction. This Agreement shall be interpreted and applied in accordance with California law. In the event of a dispute between the parties as to the language of this Contract or the construction or meaning of any term hereof, this Contract shall be deemed to have been drafted by the parties in equal parts so that no presumptions or inferences concerning its terms or interpretation may be construed against any party to this Contract. Any action or proceeding arising out of this Contract shall be filed in a California Superior Court located in Woodland, California.

(d) Waiver. A party's failure to insist on strict performance of this Agreement or to exercise any right or remedy upon breach of this Agreement shall not constitute a waiver of such performance, right, or remedy. No waiver is binding unless set forth in a writing signed by the waiving party.

(e) Assignments and Subcontracts. Contractor shall not assign this Agreement. Contractor may subcontract any of the services described in Section 1 (Scope of Work) with County's prior written consent. Contractor shall require each subcontractor to agree in writing to be bound by Section 4 (Indemnification) and Section 6 (Insurance) of this Agreement. County shall consider all subcontractors to be Contractor's employees, and Contractor shall be responsible for their work.

(f) Integration. This Agreement sets forth the parties' entire understanding regarding the matters set forth in herein. It supersedes all prior Agreements and representations, written and oral, and may be modified only by a written amendment approved by County's Chief Deputy County Administration Officer and signed by County and Contractor.

(h) Effective date. This Agreement shall be effective on the last date shown below.

(i) Public Record. Upon its execution, this Agreement (including all exhibits and attachments) shall be subject to disclosure pursuant to the California Public Records Act.

[*Signatures on Following Page*]

IN WITNESS WHEREOF, the parties have executed this Contract as of the date set forth above.

COUNTY OF YOLO:	CONTRACTOR:
By: _____	By:_____
Ryan Pistochini Director of General Services	(Signature)
	_____ (Print Name & Title)
	_____ (Date)

APPROVED AS TO FORM
Philip J. Pogledich, Yolo County Counsel

By_____

SECTION 00 55 00

NOTICE TO PROCEED

Dated: xxxxxxxxxx, 2024

TO: xxxxxxxxxxxxxx (Contractor)

ADDRESS: xxxxxxxxxxxxx
xxxxxxxxxxxxx

RE: COUNTY OF YOLO

PROJECT:

Yolo County Ag Department Shops Building

BID NO. 01

CONTRACT FOR

You are notified that the Contract Time under the above contract will commence to run on xxxxxxxxxxxxxxxxxxxx, 2024. By that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 3 of the Construction Agreement (Document 00 52 00), the date of final completion 548 calendar days from the date of this notice.

THE COUNTY OF YOLO

By:_____

Chris Rice

Project Manager
Yolo County General Services Department

SECTION 00 61 00
COUNTY OF YOLO

PERFORMANCE BOND
(To Accompany Contract)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the County of Yolo, organized and operating under the laws of the State of California, (hereinafter referred to as the "County") has awarded to _____, (hereinafter referred to as the "Contractor") an agreement for **Contract No.**_____, (hereinafter referred to as the "Project").

WHEREAS, the work to be performed by the Contractor is more particularly set forth in Contract No. for the Project dated _____, (hereinafter referred to as "Contract Documents"), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by the Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of said Contract Documents.

NOW, THEREFORE, we, _____, the undersigned Contractor and _____ as Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto the County in the sum of _____ DOLLARS, ($_____), said sum being not less than one hundred percent (100%) of the total amount of the Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Contractor, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any alteration thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill all obligations including the one (1) year guarantee of all materials and workmanship; and shall indemnify and save harmless the County, its officials, officers, employees, and authorized volunteers, as stipulated in said Contract Documents, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees including reasonable attorney's fees, incurred by the County in enforcing such obligation.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, the above obligation shall hold good for a period of one (1) year after the acceptance of the work by the County, during which time if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the

County from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the County's rights or the Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure Section 337.15.

Whenever Contractor shall be, and is declared by the County to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at the County's option:

i. Take over and complete the Project in accordance with all terms and conditions in the Contract Documents; or

ii. Obtain a bid or bids for completing the Project in accordance with all terms and conditions in the Contract Documents and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a contract between such bidder, the Surety and the County, and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the County under the Contract and any modification thereto, less any amount previously paid by the County to the Contractor and any other set offs pursuant to the Contract Documents.

iii. Permit the County to complete the Project in any manner consistent with California law and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the County under the Contract and any modification thereto, less any amount previously paid by the County to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that the County may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor.

Surety shall not utilize Contractor in completing the Project nor shall Surety accept a bid from Contractor for completion of the Project if the County, when declaring the Contractor in default, notifies Surety of the County's objection to Contractor's further participation in the completion of the Project.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project.

[REMAINDER OF PAGE LEFT INTENTIONALLY BLANK]

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20___.

(Corporate Seal)

_____
Contractor/ Principal

By_____

Title_____

(Corporate Seal)

_____
Surety

By _____
Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title_____

The rate of premium on this bond is _____ per thousand. The total amount of premium charges is $_____.
(The above must be filled in by corporate attorney.)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety) _____
_____
_____

(Name and Address of Agent or Representative for service of process in California, if different from above) _____
_____
_____

(Telephone number of Surety and Agent or Representative for service of process in California) _____

NOTE: Signatures of those executing for Surety must be properly acknowledged. The bond must be accompanied by a properly acknowledged Power of Attorney from the Surety authorizing its agent to bind it to this bond. A copy of such Power of Attorney must be on file with the Yolo County Clerk.

SECTION 00 62 00

PAYMENT BOND

BOND NO. _____

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the County of Yolo, State of California, ("Owner") has awarded to _____ ("Contractor/Principal") a contract (County Agreement No._____, dated _____,_____ , referred to as the "Agreement") for the work described as _____. The Agreement is incorporated by this reference into this Payment Bond ("Bond"); and

WHEREAS, Contractor/Principal is required to furnish a bond in connection with the Agreement and pursuant to California Civil Code section 9550;

NOW, THEREFORE, we, _____ _____ the undersigned Contractor/Principal, and _____ _____, ("Surety"), a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the County of Yolo, and to any and all persons, companies, or corporations entitled by law to file stop payment notices under California Civil Code Section 9100, or any person, company, or corporation entitled to make a claim on this bond, in the sum of _____DOLLARS ($_____), which such sum being not less than one hundred percent (100%) of the total amount payable by the Owner under the terms of the Agreement, for which payment will and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if Contractor/Principal, its heirs, executors, administrators, successors, or assigns, or subcontractor, shall fail to pay any person or persons named in Civil Code section 9100; or fail to pay for any materials, provisions, or other supplies, used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code, with respect to work or labor thereon of any kind; or shall fail to deduct, withhold, and pay over to the Employment Development Department, any amounts required to be deducted, withheld, and paid over by Unemployment Insurance Code Section 13020 with respect to work and labor thereon of any kind, then Surety will pay for the same, in an amount not exceeding the amount herein above set forth, and in the event suit is brought upon this bond, also will pay such reasonable attorneys' fees as shall be fixed by the court, awarded and taxed as provided in California Civil Code Section 9550 et seq.

It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, or specifications, or agreement pertaining or relating to

any scheme or work of improvement herein above described; or pertaining or relating to the furnishing of labor, materials, or equipment therefor; nor by any change or modification of any terms of payment or extension of time for payment pertaining or relating to any scheme or work of improvement herein above described; nor by any rescission or attempted rescission of the contract, agreement or bond; nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond; nor by any fraud practiced by any person other than the claimant seeking to recover on the bond; and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given; and under no circumstances shall the Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Owner and Contractor/Principal or on the part of any obligee named in such bond; that the sole condition of recovery shall be that the claimant is a person described in California Civil Code section 9100, and who has not been paid the full amount of his or her claim; and that the Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned, including but not limited to the provisions of sections 2819 and 2845 of the California Civil Code.

Any notice to Surety may be given in the manner specified in the Agreement and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

[REMAINDER OF PAGE LEFT INTENTIONALLY BLANK]

IN WITNESS WHEREOF, two identical counterparts of this Bond, each of which shall for all purposes be deemed an original thereof, have been duly executed by Contractor/Principal and Surety above named, on the ___ day of _____, 20__.

_____ (SEAL)
Contractor/Principal

By: _____
Contractor/'s Representative

_____
Contractor/Principal's Address

_____
City, State, Zip

_____ (SEAL)
Surety
By: _____
Surety's Representative

_____
Surety's Address

_____
City, State, Zip

_____
Telephone Number

NOTE: Signatures of those executing for Surety must be properly acknowledged. The bond must be accompanied by a properly acknowledged Power of Attorney from the Surety authorizing its agent to bind it to this bond. A copy of such Power of Attorney must be on file with the Yolo County Clerk.

SECTION 00 62 10

INDEMNIFICATION

Section 2.05 of the General Conditions - **INDEMNIFICATION**

Contractor shall pay the cost of defense, indemnify, and save harmless the County of Yolo and all its officers, agents and employers from any and all claims, demands, damages, costs expenses, injury and liability of every kind, nature and description, arising or alleged to have arisen directly or indirectly from the performance or attempted performance of the Agreement for Construction of the Work, or from the nature of the Work, or by products, materials or equipment installed in or used on the Work, howsoever the same may be caused, without set off due to the Contractor's right, if any, to apportionment between joint tortfeasors.

This indemnity obligation extends to, but is not limited to, all acts, errors, omissions, and active and/or passive negligence by the Contractor, all subcontractors, all material suppliers, and their officers, employees, agents, or subcontractors, and includes all acts, errors, omissions, and active and/or passive negligence alleged to be joint or concurrent by them and the County or any of its officers, employees, agents, independent contractors or consultants, save only liability caused exclusively by the sole negligence, willful misconduct or defects in design provided by the County or its officers, employees, agents or independent contractors (other than the Prime Contractor) who are directly responsible to the County.

This indemnity obligation expressly extends to and includes, but is not limited to any and all claims, demands, damages, costs, expenses, or liability occasioned as a result of damages to the work, the Site or improvements thereon, or to adjacent property; and for injuries occurring after completion of the Work, as well as during the progress of the Work; and as a result of the violation of any provision of Federal or State law; and for inverse condemnation or equitable relief; and occasioned by personal and/or bodily injury to or death of any person, or any damage to property owned by any person while on or about the premises by right or not, whenever the work is alleged to have been a contributing cause in any degree whatsoever.

Nothing contained in this indemnity provision shall be construed to require the Contractor to indemnify the County in contravention of Section 2782 of the Civil Code. Contractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnification obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement. In providing any defense under this Section, the Contractor shall use counsel reasonably acceptable to the County.

AGREEMENT/ACKNOWLEDGMENT

Contractor agrees that he/she has read and agrees to the indemnification clause as written above.

_____	_____	_____
Date	Authorized Representative	Title

SECTION 00 62 20

IRAN CONTRACTING ACT

As required by California Public Contract Code Section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor's status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 *et seq*.) is true and correct:

☐ The Contractor is not:

(1) identified on the current list of person and entities engaged in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or

(2) a financial instruction that extends, for 45 days or more, credit in the amount of $20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.

☐ The County has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, the City will be unable to obtain the goods and/or services to be provided pursuant to the Contract.

☐ The amount of the Contract payable to the Contractor for the Project does not exceed $1,000,000.

Signature:_____

Printed Name:_____

Title:_____

Firm Name:_____

Date:_____

Note: In accordance with Public Contract Code Section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of $250,000 or twice the Contract amount, termination of the Contract and/or ineligibility to bid on contracts for three years.

SECTION 00 62 23

FLEET COMPLIANCE CERTIFICATION

Bidder hereby acknowledges that they have reviewed the California Air Resources Board's policies, rules and regulations and are familiar with the requirements of Title 13, California Code of Regulations, Division 3, Chapter 9, effective on January 1, 2024 (the "Regulation"). Bidder hereby certifies, subject to penalty for perjury, that the option checked below relating to the Bidder's fleet, and/or that of their subcontractor(s) ("Fleet") is true and correct:

- ☐ The Fleet is subject to the requirements of the Regulation, and the appropriate Certificate(s) of Reported Compliance have been attached hereto.
- ☐ The Fleet is exempt from the Regulation under section 2449.1(f)(2), and a signed description of the subject vehicles, and reasoning for exemption has been attached hereto.
- ☐ Bidder and/or their subcontractor is unable to procure R99 or R100 renewable diesel fuel as defined in the Regulation pursuant to section 2449.1(f)(3). Bidder shall keep detailed records describing the normal refueling methods, their attempts to procure renewable diesel fuel and proof that shows they were not able to procure renewable diesel (i.e. third-party correspondence or vendor bids).
- ☐ The Fleet is exempt from the requirements of the Regulation pursuant to section 2449(i)(4) because this Project has been deemed an Emergency, as defined under section 2449(c)(18). Bidder shall only operate the exempted vehicles in the emergency situation and records of the exempted vehicles must be maintained, pursuant to section 2449(i)(4).
- ☐ The Fleet does not fall under the Regulation or are otherwise exempted and a detailed reasoning is attached hereto.

Name of Bidder: _____

Signature: _____

Name: _____

Title: _____

Date: _____

FOR USE BY THE PRIME CONTRACTOR WITH THE COUNTY OF YOLO

SECTION 00 70 00

GENERAL CONDITIONS
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GENERAL CONDITIONS

ARTICLE 1.

DEFINITIONS AND PRINCIPLES OF INTERPRETATION

Section 1.01. DEFINED TERMS.

Whenever the following terms, titles, or phrases are used in the Contract Documents, the intent and meaning thereof shall be as defined in this Article.

Section 1.02. ADDENDUM/ADDENDA.

"Addendum" or "Addenda" are written documents furnished by the County before Award of the Contract which interpret Drawings and/or Specifications or answer questions of intended bidders and shall be incorporated in and are a part of the Contract Documents.

Section 1.03. AGREEMENT FOR CONSTRUCTION.

The "Agreement for Construction" is the written contract between the County and the Contractor by which the Contractor agrees to perform the Work necessary for full completion of the Project as intended, or the portions of the Project incorporated into the Contract. The Agreement for Construction includes the Contract Documents.

Section 1.04. ALLOWANCE.

An "Allowance" is the County's monetary and/or quantity estimate for equipment, materials, or work, the quantity and/or quality of which the County has not determined at the time of the Award of the Contract. The Contractor's bid includes all specified allowances, if any. "Allowance" also includes the contingency allowance specified to be included in the Contractor's bid, if any.

Section 1.05. AWARD OF CONTRACT; DATE.

The "Award of the Contract" is the action by the County Administrators Office of the County to execute the Agreement for Construction with the lowest responsible bidder and constitutes the County's acceptance of the Bid offer.

The Award of the Contract occurs after the County has determined which bid alternates, if any, are to be included in the Work, and has determined whether the apparent low bidder for the Work, including such alternates, is the lowest responsible bidder.

The date of the Award of the Contract is the date the County Administrators Office acts to authorize execution of the Agreement for Construction by the County, even though actual execution of the Agreement by the County does not occur until the Contractor submits the bonds and insurance certifications required by Article 2.

Section 1.06. BID.

The "Bid" shall mean the offer of the bidder to do the Work, when submitted on the prescribed bid form, duly executed and bonded. After Award of the Agreement for Construction by the County to the lowest responsible bidder, "Bid" shall mean the Contract Price.

Section 1.07. BOARD OF SUPERVISORS/COUNTY ADMINISTRATIVE OFFICER.

"Board of Supervisors" shall mean the duly elected officials constituting the Yolo County Board of Supervisors.

"County Administrative Officer" (CAO) is the County Administrative Officer of the County and reports to the Board of Supervisors, or the CAO's designee.

Section 1.08. CERTIFICATION.

When used in the context of required submittals regarding quality assurance, "Certification" shall be the verification required from recognized producers or associations attesting to a product's compliance with the Contract Documents. Examples include Underwriters Laboratory ("UL") listings.

Section 1.09. CHANGE ORDER.

A "Change Order" is a written order from the County to the Contractor authorizing an addition, deletion, or revision in the Scope of the Work, and/or an adjustment in the Contract price or Contract Time, issued after the execution of the Agreement for Construction.

Section 1.10. CLARIFICATIONS.

"Clarifications" are supplementary explanations, interpretations, instructions, and/or drawings issued by the Contract Administrator to further define the intent of the Contract Documents, pursuant to Article 4 of the General Conditions and procedures developed by the Contract Administrator pursuant thereto.

Clarifications involve no change in the Scope, Price or Time of the Agreement for Construction.

Section 1.11. CONTRACT ADMINISTRATOR/PROJECT MANAGER.

See Section 3(a) of the Agreement for Construction.

Section 1.12. CONTRACT DOCUMENTS/PROJECT MANUAL.

The "Contract Documents" shall include the Bid Proposal; the Designation of Subcontractors; the Agreement for Construction; the Bonds required thereby; these General Conditions; the Supplementary Conditions, if any; the Technical Specifications; all Documents comprising the bidding package; the Contract Drawings, (collectively referred to as "Project Manual"); all duly issued Addenda, Clarifications, Field Orders, and Work Authorizations; Change Orders; Supplemental Drawings; Contractor's Submittals approved pursuant to Articles 3 and/or 5 hereof, and the Contractor's Guarantee and Bonds. The Contract Documents comprise the "Agreement for Construction."

Section 1.13. CONTRACT DRAWINGS.

The "Contract Drawings" or "Drawings" shall mean the working drawings of the Work approved by the Board of Supervisors for the receipt of bids, plus all supplemental drawings approved by the County as

Addenda or Clarifications, or reproductions thereof, which show the location, character, dimensions, and details of the Work to be done, and which are part of the Agreement for Construction.

Section 1.14. CONTRACT PRICE.

The "Contract Price" is the total consideration for which the contractor agrees to perform the Work to produce a fully complete Project as intended by, and in accordance with, the Contract Documents. Unless modified by a duly issued Change Order, the Contract Price is the Contractor's Bid.

Section 1.15. CONTRACT TIME.

The "Contract Time" is the time specified in the agreement for Construction within which Contractor shall fully complete the Project in accordance with the Agreement for Construction. The Contract Time may be changed only by a Change Order duly issued by the Contract Administrator. Contract Time begins with the date of the Notice to Proceed and ends with acceptance of project work completion by the County. The number of days included in the agreement form includes the estimated number of construction days required and not the 35 days allowed for initial submittals and the 21 days allowed for County review of those submittals.

Section 1.16. CONTRACTOR; PRIME CONTRACTOR.

"Contractor" and "Prime Contractor" shall mean the person or persons, co-partnership or corporation, or his or their legal representatives, or successors, assigns, executors, or heirs, who have entered into the Agreement for Construction with the County of Yolo.

Section 1.17. COUNTY.

"County" shall mean the County of Yolo, a political subdivision of the State of California.

Section 1.18. COUNTY INSPECTOR.

The "County Inspector" is the person(s) and/or firm(s), if any, employed or engaged as (an) independent contractor(s) by the County to inspect the performance of the Work by the Contractor for compliance with the Contract Documents. The County Inspector is supervised by and reports to the Contract Administrator. The authority of the County Inspector is limited to that specified in the Contract Documents, and no additional authority has been granted nor shall be inferred.

The Project Manager performs the duties of the County Inspector unless a separate person or firm is engaged as County Inspector.

Section 1.19. DAY/HOLIDAY; WORKING DAY; COUNTING DAYS.

A "day" shall mean a calendar day of 24 hours, including each and every day of the year.

A "working day" is Monday through Friday, but shall exclude "holidays" established by the Sacramento Builders' Exchange.

Unless specified as being working days, all references herein to the number of days within which an action is to occur shall mean calendar days.

In computing working days or calendar days, the first day is excluded and the last day is included, unless it is a Saturday, Sunday, or holiday.

Section 1.20. RESERVED.

Section 1.21. MATERIALS.

"Materials" shall include all building materials, articles, supplies, and equipment delivered to the Site for incorporation in the Work. "Materials" includes everything incorporated into the work except personal services and labor, unless otherwise noted.

"Equipment" shall mean all pre-manufactured or partially pre-assembled products or components, assembled or partially assembled before delivery to the Site, and intended for incorporation into the Work.

Section 1.22. NOTICE OF CESSATION OF WORK.

A "Notice of Cessation of Work" is a notice containing the information required by Civil Code Section 3092, recorded in the Yolo County Recorder's Office, indicating that there has been a continuous cessation of labor on the Work of the Agreement for Construction for at least thirty (30) days prior to recordation of the Notice. The Notice shall specify the date on or about when the cessation of labor commenced.

Section 1.23. NOTICE OF COMPLETION.

A "Notice of Completion" is a notice containing the information required by Civil Code Section 3093, recorded in the Yolo County Recorder's Office, indicating that the Work of the Agreement for Construction has been accepted by the County.

Section 1.24. PROGRAM MANAGER.

If assigned by the Contract Administrator, "the Program Manager" is that County official responsible for team leadership in coordinating departmental program requirements; for preparation of the statement of project objectives; for presenting project objectives to the Contract Administrator and Board of Supervisors; for heading the design team (for designated projects); for arranging project financing; for maintaining program oversight during the bidding and construction phases; and for providing joint progress reports, with the Contract Administrator, to the Board of Supervisors. The program manager represents the County to State and/or Federal program offices sponsoring the project. In the absence of an assigned program manager, the Contract Administrator shall discharge these duties.

Section 1.25. PROJECT.

The "Project" is the total construction, of which the Work performed under the Agreement for Construction is the whole unless the Contract Documents specifically note to the contrary.

Unless so noted, the terms "Project" and "Work" are synonymous.

Section 1.26. PROJECT ARCHITECT/ENGINEER/CONSULTANT.

The "Project Engineer" is the firm employed or engaged as an independent contractor by the County to design the Project, and all sub-consultants or joint ventures of the Project Engineer. The authority of the Project Engineer to bind the County is limited to that authority specified in the Contract Documents, and no additional authority has been granted nor shall be inferred.

The Project Engineer advises the Contract Administrator in all aspects of the construction phase of the Project. The Project Engineer’s functions include advice and assistance to the Contract Administrator in the correct interpretation and application of the Contract Documents. However, the

Contract Administrator or his/her designate is the County's representative on the Project, not the Project Engineer. The Project Engineer is not authorized independently to issue Addenda, Clarifications, Field Orders, Work Authorizations, or Change Orders, or in any other way to bind the County in discussions with the Contractor.

The Contractor shall deliver all correspondence relating to the proper execution of the Work to the Contract Administrator, with a copy delivered to the Project Engineer. The Contract Administrator reserves the right to consult with the Project Engineer prior to responding to the Contractor's correspondence.

When discussions between the Contractor and the Contract Administrator occur either on the Site or elsewhere, but the Project Engineer is not present, the Contract Administrator reserves the right to consult with the Project Engineer prior to issuing his final decision or instruction.

Section 1.27. REFERENCE TO CODES.

Unless otherwise noted, all references to statutes are to the law of the State of California as codified in the various specified codes.

Section 1.28. SITE.

"Site" is the area designated in the Contract Documents within which the Project is to be constructed.

Site for this purpose includes the area where Work on utility systems for the Project is to be performed by the Contractor under the Agreement for Construction, even though such areas may be designated as "off-site" on the Contract Drawings.

Section 1.29. SPECIFICATIONS.

"Specifications" shall mean the Technical Specifications portions of the Project Manual (Volume II) regarding qualities of materials and/or methods of workmanship to be furnished under the Contract. Specifications are organized into divisions, sections, and articles to enable grouping of the various portions of the Work into logical format, but this organization does not in any way restrict the Contractor in dividing the Work among subcontractors, or in establishing the extent of the Work to be performed by any trade.

Section l.30. SUBCONTRACTOR.

Unless other specified, "subcontractor" refers to all contractors doing any work on the Project, including first, second, and subsequent tier contractors, excluding only the Prime Contractor.

Section 1.31. SUBMITTALS.

As used in Articles 3 and 5 hereof, "submittals" shall mean shop drawings, product data, and samples, as defined below:

A. Shop Drawings are drawings, diagrams, schedules and other data specifically prepared for the Work by the Contractor or any subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work, and/or the method of installation of Materials.

B. Product Data are illustrations, standard schedules, performance charts, certifications, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.

C. Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

As used elsewhere herein, "submittals" is a general term including all information, certifications, data or samples required to be delivered by the Contractor to the County.

Section 1.32. SUPPLEMENTARY CONDITIONS.

The "Supplementary Conditions" are specific clauses in the Project Manual setting forth conditions or requirements peculiar to the Work, and supplementary to the General Conditions.

Section 1.33. WORK/NOTICE TO PROCEED.

The "Work" is the completed construction required by the Contract Documents to perform the Agreement for Construction fully and completely, and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

Unless specifically noted in the contract Documents as not included in the Agreement for Construction, "work" includes all construction necessary to fully complete the Project as intended, including all bid alternates selected by the County for inclusion in the Work.

Unless so noted, the terms "Work" and "Project" are synonymous.

The Work shall commence upon issuance by the County of a Notice to Proceed so authorizing.

Section 1.34. WORK AUTHORIZATIONS.

"Work authorizations" are written orders to the Contractor, which amend the Contract Documents as described, and authorize the Contractor to proceed with the Work noted therein. Pursuant to Section 17.03 hereof, Work Authorizations may be cumulated into periodic Change Orders to adjust the Contract Price and/or Time, upon verification by the Contractor of the actual cost and delay, if any, caused by the Work Authorization.

ARTICLE 2.

BONDS; INDEMNIFICATION; INSURANCE

Section 2.01. BONDS; SUBMITTALS.

Within ten (10) calendar days following the Award of the Contract, and before the County will execute the Agreement for Construction, the Contractor to whom the Contract is awarded shall obtain and submit to the County bonds as set forth below in Sections 2.02 and 2.03. The Contractor is advised that a copy of the Power of Attorney authorizing execution of the bonds on behalf of the corporate surety must be filed with the Yolo County Clerk prior to approval of the bonds by the County.

Provision of the bonds required by Sections 2.02 and 2.03, and the insurance certificate required by Section 2.07 is a condition precedent to the Contractor's rights on the Agreement for Construction and a material covenant thereof.

Section 2.02. PERFORMANCE BOND.

The Contractor shall submit a faithful performance bond on the form provided with the Instructions to Bidders, duly executed by a responsible corporate surety authorized to do business in the State of California and acceptable to the county, conditioned upon the faithful performance by the contractor of all requirements of the Contract Documents. The amount of said bond shall be in a sum no less than One-Hundred Percent (100%) of the total Contract Price.

Section 2.03. LABOR AND MATERIALS PAYMENT BOND.

The Contractor shall submit a payment bond on the form provided with the Instructions to Bidders, duly executed by a responsible corporate surety authorized to do business in the State of California and acceptable to the County, which in all respects complies with Civil Code Section 9550 and following. This bond, hereinafter referred to as a "Payment Bond", shall be in a sum no less than One-Hundred Percent (100%) of the total Contract Price.

Section 2.04. CONTRACT BOND.

Prior to final payment as provided in Article 26, Contractor shall furnish a bond issued by a responsible corporate surety licensed to do business in the State of California in a form provided or approved by the County, and securing the performance by Contractor of his obligation undertaken by virtue of the guarantees required by Article 26. Such bond shall remain in full force and effect for a period of no less than one (1) year from and after recordation by the County of a Notice of Completion or a Notice of Cessation of Work, and shall be in a sum no less than ten (10%) percent of the total amount of the final Contract Price. In lieu of such bond, the Contractor may submit a certified or cashier's check, cash, or an irrevocable, unconditional letter of credit in a form acceptable to County, or may extend the final withhold account on terms and conditions acceptable to the county to secure performance of Contractor's obligations on the guarantee.

Section 2.05. INDEMNIFICATION.

Contractor shall pay the cost of defense, indemnify, and save harmless the County of Yolo and all its officers, agents and employers from any and all claims, demands, damages, costs expenses, injury and liability of every kind, nature and description, arising or alleged to have arisen directly or indirectly from the performance or attempted performance of the Agreement for Construction of the Work, or from the nature of the Work, or by products, materials or equipment installed in or used on the Work, howsoever the same may be caused, without set off due to the Contractor's right, if any, to apportionment between joint tortfeasors.

This indemnity obligation extends to, but is not limited to, all acts, errors, omissions, and active and/or passive negligence by the Contractor, all subcontractors, all material suppliers, and their officers, employees, agents, or subcontractors, and includes all acts, errors, omissions, and active and/or passive negligence alleged to be joint or concurrent by them and the County or any of its officers, employees, agents, independent contractors or consultants, save only liability caused exclusively by the sole negligence, willful misconduct or defects in design provided by the County or its officers, employees, agents or independent contractors (other than the Prime Contractor) who are directly responsible to the County.

This indemnity obligation expressly extends to and includes, but is not limited to any and all claims, demands, damages, costs, expenses, or liability occasioned as a result of damages to the work, the Site or improvements thereon, or to adjacent property; and for injuries occurring after completion of the Work, as well as during the progress of the Work; and as a result of the violation of any provision of Federal or State law; and for inverse condemnation or equitable relief; and occasioned by personal and/or bodily injury to or death of any person, or any damage to property owned by any person while on or about the premises by right or not, whenever the work is alleged to have been a contributing cause in any degree whatsoever.

Nothing contained in this indemnity provision shall be construed to require the Contractor to indemnify the County in contravention of Section 2782 of the Civil Code. Contractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnification obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement. In providing any defense under this Section, the Contractor shall use counsel reasonably acceptable to the County.

Section 2.06. INDEMNIFICATION OF ADJACENT PROPERTY OWNERS.

In the event the Contractor enters any agreement with the owners of any property adjacent to the Site and enters upon such property for the purpose of performing the Work, the Contractor shall fully indemnify, defend and save harmless such person, firm, or corporation, State or other governmental agency which owns or has any interest in such adjacent property. The form and content of such indemnification agreement shall be approved by County prior to commencement of the Work on or about such property. Contractor also shall indemnify the County as provided in Section 15.06.

Section 2.07. INSURANCE; SUBMITTALS.

The Contractor shall obtain, at its sole cost and expense, all insurance specified in the Agreement for Construction, and shall require all subcontractors to maintain insurance as specified therein. Continued maintenance of such insurance is a material covenant of the Agreement for Construction.

In addition to the submittals required by the Agreement for Construction, the County reserves the right to examine the insurance policies referenced in any such Certificate at any time, before or after issuance of the Notice to Proceed. Issuance of the Notice to Proceed shall not constitute a waiver of the County's right strictly to enforce the requirements of this Article.

The Contractor shall submit photocopies of its insurance and/or subcontractors' insurance policies when requested by the Contract Administrator.

Section 2.08. CONTRACTOR'S INSURANCE REQUIREMENTS.

Consistent with the Agreement for Construction, Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property that may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors. Any deviation from the required coverage specified in the Agreement for Construction must be approved by the County prior to the commencement of the work.

Section 2.09. SUBCONTRACTORS' INSURANCE.

Subcontractors

A. **Insurance Coverage Requirements**. Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated in the Agreement for Construction and herein.

B. **(Reserved)**

C. **Contractor Responsibilities.** It shall be the responsibility of the Contractor to certify that all subcontractors (including lower-tier subcontractors) comply with these provisions, and to enforce their continued compliance throughout the progress of the Work. The submittals required to demonstrate initial compliance with this Section are specified in Section 3.02 hereof. Thereafter, the Contractor shall submit a certification to the required subcontractor's insurance when requested by the Contract Administrator. In lieu of the above the contractor can name all subcontractors on its policy as additional insured as approved by the County.

Section 2.10. WORKERS' COMPENSATION AND EMPLOYEES' LIABILITY INSURANCE

In accordance with Section 3700 of the Labor Code, the Contractor, and each subcontractor, shall secure the payment of workers' compensation to its employees as specified in the Agreement for Construction.

In the event that there is any employee working on the Project who is not protected under the Workers' Compensation statute for any reason, including because he is engaged in hazardous work, the Contractor shall provide, and shall cause each subcontractor to provide, adequate insurance for the protection of such employee. Such insurance shall comply with all requirements of the Labor Code.

Section 2.11. POSTING AT SITE.

The Contractor shall post, and cause all subcontractors to post, in a conspicuous place on the Project Site, a statement as required by Labor Code Section 3550, stating the name of the employer's compensation insurance carrier or that the employer is self-insured, and who is responsible for claims adjustment.

Section 2.12. EFFECTIVE DATE OF POLICIES.

The insurance required by this Article shall be in full force and effect at all times during prosecution of the Work and until the final completion and acceptance thereof by County, and every policy shall state that it shall not be assigned, canceled or reduced in coverage without thirty (30) days' prior written notice to County.

ARTICLE 3.

INITIAL SUBMITTALS AND TIME OF WORK

Section 3.01. PROGRESS SCHEDULE AND SCHEDULE OF VALUES.

A. **Progress Schedule**. No later than thirty-five (35) calendar days following the Award of the Contract by the County and before issuance of a Notice to Proceed, the Contractor shall submit to the Contract Administrator a schedule showing the date on which work will commence on each part or class of the Work described with reference to the Divisions in the Technical Specifications and the responsible subcontractor(s); estimated dates of completion of such parts or classes; the working days proposed for work, and the approximate percentage of Work scheduled for completion at any time. Critical path sequencing items shall be identified. The Progress Schedule shall be practicable and consistent with the time requirements of the Agreement.

When requested by the Contract Administrator, or when the Contractor requests a Contract Time Extension Change Order, the Contractor shall submit a revised Progress Schedule showing changes to the originally approved Schedule necessary to complete the Work within the requested Contract Time.

B. **Schedule of Values**. Simultaneously with the Progress schedule, the Contractor shall submit a Schedule of Values, showing a breakdown of the Contract Price with reference to the parts or classes or work shown on the Progress Schedule, and with reference to the Divisions in the Technical Specifications.

This schedule shall include products and materials allocated to each Allowance specified by the Contract Documents.

When requested by the Contract Administrator, or when the Contractor requests a Contract Price adjustment, the Contractor shall submit a revised Schedule of Values incorporating the requested Price adjustment(s).

Section 3.02. INITIAL SUBMITTALS.

No later than thirty-five (35) calendar days after the Award of the Contract by the County, and before issuance of a Notice to Proceed, the Contractor shall make the following initial submittals:

A. **Schedule of Unavailable Materials**: A schedule showing any materials called for in the Contract Documents which are not obtainable for installation in the Project within the time limits set forth in the Progress Schedule, and the reasons known to Contractor for the unavailability.

The schedule shall detail Contractor's efforts to obtain the materials in question.

B. **Schedule of Substitutions**: Contractor shall submit a schedule of all proposed Substitutions. The request for Substitutions shall in all respects comply with Article 7 of these General Conditions and shall include all requests for Substitutions of "an equal" item as defined by Public Contracts Code Section 3400 and Sections 7.02 and 7.03 hereof.

Failure to indicate such requested Substitutions on this schedule shall be deemed a waiver of the request for Substitution.

C. **Schedule of Items Requiring Long Order Lead Time**: Contractor shall submit a schedule of all materials, the delivery of which will require more than 50% of the total Contract Time. The dates

shown on this schedule shall be consistent with the Progress Schedule, and the Schedule shall specify the dates of order and expected delivery dates for the specified materials.

D. **Subcontractor Insurance**:

1. **First-Tier Subcontractors:** The Contractor shall submit certificates of insurance for liability and workers' compensation insurance for all first-tier subcontractors, as required by Article 2 hereof. The County reserves the right to examine copies of the subcontractors' insurance policies.

2. **Lower-Tier Subcontractors**: If requested by the Contract Administrator, Contractor shall submit certificates of liability and workers' compensation insurance for any or all lower-tier subcontractors. The County reserves the right to examine copies of the lower-tier subcontractors' insurance policies.

E. **Subcontractors: Allocation of Work**: Contractor shall submit a chart showing all first and lower-tier subcontractors, and the contractual relationships between them, and identifying the Work to be done by each.

F. **Schedule of Submittal Dates**: Contractor shall submit a schedule indicating the dates upon which all required submittals will be submitted. Such schedules shall conform to Section 5.02 of the General Conditions and shall include all submittals required by the Contract Documents.

Section 3.03. APPROVAL OF INITIAL SUBMITTALS; EFFECT.

Prior to issuance of a Notice to Proceed, the Contract Administrator shall act upon the initial submittals required by Section 3.02.

The time for the Contract Administrator's action shall be twenty-one (21) days or less, from the date Contractor delivers submittals that conform to the Contract Documents.

In the event the Contract Administrator rejects an initial submittal, the Contractor shall not be entitled to any Contract Time extension on account of delay associated with re-submittal and re-approval. The County reserves the right to reject initial submittals in whole or in part, and the Contractor shall correct the submittal to comply with the Specifications and any requirements noted by the Contract Administrator in rejecting the submittal before issuance of a Notice to Proceed.

Once approved, all initial submittals shall be incorporated as part of the Agreement and Contractor shall comply therewith. The Contract Administrator is authorized to approve revisions to the Progress Schedule or Schedule of Values as required to incorporate approved changes in the Contract Time or Price.

Failure to meet the approved Progress Schedule is grounds for withholding Progress Payments pursuant to Article 23.

Section 3.04. COMMENCEMENT AND PROSECUTION OF WORK.

The Contractor shall not commence nor allow any subcontractor to commence work before receiving a Notice to Proceed from the County, specifying the day work is to commence. The Contractor shall commence work on such day, and shall prosecute the Work diligently to completion thereafter, at a rate that meets or exceeds the approved Progress Schedule.

Section 3.05. OTHER SUBMITTALS.

The Contractor shall make all submittals specified by the Technical Specifications for all Work to be done in the first sixty (60) days after issuance of the Notice to Proceed.

Section 3.06. TIME OF ESSENCE.

Time is of the essence of the Agreement for Construction.

Section 3.07. DATE OF COMPLETION.

The Contractor obligates himself to make the whole Work fully complete and satisfactory on or before the completion date specified in Section 2 of the Agreement for Construction, plus any Contract Time extensions approved by Change Order. The date of completion is the date of recordation of the Notice of Completion pursuant to Section 25.04; provided, however, that the date of completion for purposes of determining whether the Contractor has completed the Work within the time required by the Agreement for Construction shall be deemed to be the date the Contractor filed the "Contractor's Request for Final Payment" pursuant to Section 25.01 if, and only if, the Work was in fact fully complete and in full conformity with the Contract Documents when the Contractor's request was filed.

Section 3.08. EXTENSION OF TIME; UNAVOIDABLE DELAYS.

The Contractor shall not be granted a Contract Extension except on the issuance of a Change Order by the County Administrator, upon a finding that the delay in completion was unavoidable.

Delays in prosecution of parts or classes of the Work that are not demonstrated to prevent or delay completion of the entire Project within the Contract Time are not "unavoidable delays" for purposes of this section.

In all cases, the time authorized for extension of the Contract Time shall be no greater than the number of days directly attributable to the unavoidable delay which caused delay in the completion of the Project. "Unavoidable delay" for this purpose shall be defined as follows:

A. **Unavailable Materials.** That materials or articles called for in the Contract Documents are not obtainable within the time required for timely completion; provided that such materials or articles were listed by the Contractor in the schedule required by Section 3.02 hereinabove; that the Contractor demonstrates that the unavailability of the materials is in fact the cause for the delay, and could not have been cured by adjusting the Progress Schedule; and that the unavailability of such materials is due to circumstances beyond the Contractor's control. If good cause for a delay is demonstrated pursuant to this subsection, the County, at its sole discretion, may grant a time extension or apply Section 17.09 hereof.

B. **Force Majeure**. That delays in construction have resulted from circumstances beyond the control of the Contractor and which the Contractor could not have provided against by the exercise of reasonable care, prudence, foresight, and diligence. Unavoidable delays within the meaning of this subparagraph shall be those caused by acts of neglect of the County or its officers, agents, or employees; by acts of God, war, insurrection, civil disorder, fire, floods, epidemic, or strikes.

C. **Unseasonable Weather**. An extension of time may be granted due to weather which is unsuitable for the Work currently in progress, upon the findings that the weather conditions in fact caused the delay in completion of the Project and that such weather conditions were not, and could not in the exercise of reasonable diligence, have been foreseen by the Contractor.

Unseasonable weather that, in the exercise of reasonable foresight and diligence, should be expected in the area at the time of year in question is not cause for an extension of time.

D. **Time Extension Due to Change Orders or Work Authorizations**. A time extension may be granted due to a delay in the Project caused by the approval by the County of a Change Order or Work Authorization pursuant to Article 17. The Contractor shall be entitled to a time extension Change Order only when the extra work is demonstrated by the Contractor to have caused a delay in the Project. When a Work Authorization is issued, the Contract Administrator or County Administrative Officer is authorized to approve an allocation of time attributable to that Work Authorization. Approval of such allocation shall not constitute County's approval of a time extension to the overall Contract time but shall constitute County approval of the time allocated by the Contractor to perform the particular extra work in question.

The provisions of Sections 3.08 and 3.09 shall be applicable to requests for time extensions due to extra work.

The Contract Administrator may cumulate requests for time extensions due to Work Authorizations and process periodic Change Orders therefore, if warranted, or may process a Contract Time Extension Change Order simultaneously with the Contract Price Change Order, in their sole discretion.

E. **Delay Due to Rejected Submittals**. In the event the Contract Administrator rejects a submittal, the Contractor shall not be entitled to any Contract Time extension on account of delay associated with re-submittal.

The procedure for submittals shall be as specified in Articles 5 and 7 (Substitutions) and the Technical Specifications. The Contract Administrator shall approve or reject submittals within twenty-one (21) days of the Contractor's delivery of the submittal, unless a different time is specified in the Technical Specifications for the particular submittal in question.

F. **County Caused Delays**. In the event that the Project is delayed by acts of the County not authorized by the Contract Documents which the Contractor demonstrates will or have caused an unavoidable delay as defined by Subparagraph "B", the Contractor shall be entitled to a Contract Time and/or Contract Price Change Order to offset the extra time and/or costs incurred by the Contractor. Such extra costs shall be limited to those "actual costs" as defined in Section 17.02-D directly caused by the delay and incurred on this Project only. Overhead and profit shall be limited to that specified in Section 17.02-C hereof. Extra costs shall not include indirect costs nor loss of profits or increased costs on other work. Extra time shall be limited to that directly caused by the delay, as defined in Subparagraph "B" hereof.

The Contractor specifically agrees that a time extension and cost adjustment as provided herein is its sole remedy for County-caused delays and agrees to make no claim or demand for additional damages, nor claim an acceleration of the time for performance.

The Contractor shall not be entitled to any Contract Time Extension nor Contract Price adjustment for alleged County delays if the County has acted within the time limits specified by the Contract Documents.

The Contractor shall not be entitled to any cost adjustment for delays except for County caused delays as specified in this subsection.

Section 3.09. NOTICE OF DELAYS; SUBMITTALS.

Whenever the Contractor foresees any delay in the prosecution of the Work, and in any event immediately upon the occurrence of any delay which the Contractor regards as grounds for an extension and/or cost adjustment as specified in section 3.07., the Contractor shall notify the Contract Administrator in writing of the delay. Such notification shall specify with detail the cause asserted by the Contractor to constitute grounds for an extension, and/or cost adjustment. Failure of the Contractor to submit such a notice within five (5) days after the initial occurrence of the event giving rise to the delay shall constitute a waiver by the Contractor of any request for a time extension and/or cost adjustment, and no extension and/or cost adjustment shall be granted as a consequence of such delay.

With its request for time extension and/or cost adjustment, the Contractor shall submit evidence to demonstrate that the delay in prosecution in the work will result in an unavoidable delay in completion of the entire Project. Such evidence shall include a demonstration that the delayed portion of the Work will affect the critical path scheduling of the entire Project. The Contractor shall also submit a proposed revised Project Schedule, which accounts for the delay in completion of the entire Project caused by the delay in prosecution of part of the Project, and includes a revised critical path demonstrating how the Project will be completed within the proposed revised Contract Time.

Section 3.10. INVESTIGATION; PROCEDURE.

Upon receipt of a request for a Contract Time extension and/or cost adjustment, the Contract Administrator shall conduct an investigation of the facts asserted by the Contractor to constitute grounds for an extension and/or cost adjustment. The results of this investigation shall be reported by the Contract Administrator to the Contractor and the Contract Administrator shall indicate whether he will recommend for or against such extension.

The Contract Administrator may, in his sole discretion, defer this recommendation to allow the accumulation of time extensions and/or cost adjustment due to Work Authorizations into a periodic or final Change Order request.

If the Contract Administrator disallows the request, there shall be no allowance made for the time during which the request was pending, and the Contractor shall remain obligated to complete the Work in the time specified.

If the Contract Administrator approves the time extension change order, the new Progress Schedule submitted by the Contractor and approved by the County shall be deemed to amend the original Progress Schedule approved by the County pursuant to Section 3.03 hereof; thereafter, the amended Progress Schedule shall have the same force and effect as the originally approved Progress Schedule.

The Contractor agrees that the determination of the Contract Administrator as to whether grounds for an extension and/or cost adjustment exist, and if so, the duration of the extension and/or cost adjustment, shall be final and binding upon both County and Contractor.

Section 3.11 DISCRETIONARY TIME EXTENSION FOR BEST INTEREST OF COUNTY.

The County reserves the right to extend the Contract Time for completion of the Work if the County Administrator determines that such extension is in the best interest of the County.

Section 3.12. LIQUIDATED DAMAGES.

If the Work is not completed by Contractor in the time specified in Section 2 of the Agreement for Construction or within any period of extension authorized pursuant to this Article, the Contractor acknowledges and admits that the County will suffer damage, and that it is impracticable and infeasible to fix the amount of actual damages. Therefore, it is agreed by and between the Contractor and the County that the Contractor shall pay to the County as fixed and liquidated damages, and not as a penalty, the sum specified in the Agreement for Construction for each calendar day of delay until the Work is completed and accepted, and that both the Contractor and the Contractor's surety shall be liable for the total amount thereof, and that the County may deduct said sums from any monies due or that may become due to the Contractor.

This liquidated damage provision shall apply to all delays of any nature whatsoever, save and except only unavoidable delays approved by the Contract Administrator pursuant to Section 3.07 hereinabove.

The Contractor also acknowledges that the contract completion date for purposes of liquidated damages shall be the date of the Board of Supervisors' Resolution of Acceptance, unless Section 3.06 applies.

Section 3.13. EXTENSION OF TIME NOT A WAIVER.

Any extension of the Contract Time granted pursuant to this Article shall not constitute a waiver by the County, nor a release of the Contractor, from his obligations to perform this Contract in the Contract Time.

Granting of a time extension due to one circumstance on one request therefore shall not constitute a granting by the County of an extension of time for any other circumstance or the same circumstance occurring at some other time, and shall not be interpreted as a precedent for any other request for extension.

Section 3.14. SUSPENSIONS EXCEEDING ONE YEAR.

Should the Work be suspended for a period exceeding one (1) calendar year due to war conditions, labor conditions, legal actions, or for other conditions constituting the legal defense of impossibility of performance, the Contract and the County agree to enter an agreement terminating the Agreement for Construction upon the following terms and conditions:

The County shall be responsible only to pay the Contractor the actual value of the completed Work, to the County, less progress payments made to date, less any deductions authorized by the Contract Documents, and plus the ten (10%) percent withhold from previously issued progress payments.

As between the Contractor and the County, it shall be conclusively presumed that the actual value to the County for the Contractor's Work to the date of the last progress payment is not more than the actual amount of progress payments made to date plus the ten (10%) percent withhold from such progress payments; provided, however, that this section shall not preclude the County from deducting charges for work or materials which do not meet the requirements of the Contract Documents.

Such final payment shall be due only after any stop notices are resolved or the time to file stop notices has expired.

Section 3.15. EFFECT OF STOP WORK NOTICE.

If the County orders a suspension of the Work pursuant to Section 18.05, the days on which the suspension is in effect shall be included in determining the required completion date and shall not otherwise modify or extend the time within which the Contractor is to perform. In such event, the Contractor shall not be entitled to any damages or compensation on account of such suspension or delay, and the suspension and/are delay shall not constitute an acceleration of the performance time.

If the Contract Administrator determines that the Work conforms in all respects to the Contract Documents and releases the Stop Work Notice, the Contractor shall recommence work and may thereafter request a time extension pursuant to Section 3.07-F hereof. Sections 3.07, 3.08, and 3.09 shall apply to such requests.

ARTICLE 4.

SCOPE AND INTENT OF CONTRACT DOCUMENTS; CLARIFICATIONS

SECTION 4.01. BASIC INTENT AND SCOPE OF CONTRACT DOCUMENTS.

The basic intent of the Contract Documents is to describe the complete Project, including all materials, labor, equipment, and incidentals necessary for the proper execution and full completion of the work. The scope of the Agreement for Construction shall include everything directly called for by the contract Documents, and all work reasonably to be foreseen and/or inferred by competent contractors of the various required trades in order to completely perform the Work to produce the complete Project as intended.

The Agreement for construction does not recognize "substantial performance" as equivalent to "complete performance"; by entering the agreement, the contractor agrees, as a material covenant, to provide "complete performance" within the contract Time, for the amount included in the Contractor's bid as the Contract Price, unless modified by Change order. No extra compensation shall be allowed for any work or materials not directly appearing in the Contract Documents, but which a competent contractor should have foreseen and/or inferred would have been within the scope of the Agreement for Construction for work of the type and in the area of the Project. Even though items of work are not separately mentioned in the contract Documents, the Scope of the Agreement includes the furnishing and installation of all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for the sound, secure and fully complete performance of the work.

The Contract Price shall include all compensation for furnishing all labor, materials, tools, equipment and incidentals, and doing all work necessary fully to complete the Project as intended.

Section 4.02. HARMONIZATION OF CONTRACT DOCUMENTS.

The Contract Documents are complimentary, and what is required by anyone shall be as binding as if required by all. The Contract Documents are intended to be coordinated to describe and provide for the complete Project. However, where conflicts exist between the CONTRACT DOCUMENTS, such conflicts shall be clarified to the following order, the first taking precedence over the lower ranked:

CONTRACT CHANGE ORDERS
ADDENDA
SPECIAL PROVISIONS
TECHNICAL SPECIFICATIONS/PROVISION
CONTRACT DRAWINGS
CONSTRUCTION AGREEMENT (CONTRACT)
NOTICE TO BIDDERS
GENERAL CONDITIONS
STANDARD CONSTRUCTION SPECIFICATIONS
CONTRACTOR'S PROPOSAL BID

Scale drawings, full sized details, and technical specifications are intended to be coordinated and to agree fully. unless specifically noted otherwise in the Technical Specifications, all work and materials necessary for each unit of construction, even though only briefly mentioned or indicated, shall be furnished and installed fully and completely as specified in accepted submittals and the manufacturers' instructions and/or recommendations.

For convenience, the Specifications and Drawings in the Contract Documents are arranged in several sections, but such separation shall not be considered as the limits of the Work required by any separate trade. The terms and conditions of the Work to be performed by any subcontractor are strictly between the Contractor and such subcontractor.

Section 4.03. LOCATIONS.

The locations of equipment, wiring, piping, and similar materials and equipment are shown diagrammatically in the Contract Documents; actual Site conditions may not always permit their installation precisely in the location shown on the Contract Drawings. Contractor shall coordinate installation of equipment.

Section 4.04. SITE CONDITIONS.

Where investigations have been conducted by the County of existing conditions on the Site including subsurface conditions, such investigations are made for the purpose of design only and for the information of bidders. The results of such investigations represent only the statement by the County as to the circumstances and character of materials actually encountered by the county during the investigations. The County makes no guarantee or warranty, express or implied, that the conditions indicated are representative of conditions existing throughout the Site of the Project or any part of it, or that unanticipated conditions might not occur.

All excavation work shall be performed on an "unclassified basis; that is, shall include the removal of all material encountered including earth or rock formations, regardless of type or hardness thereof or groundwater conditions in the excavation, the cost of such excavations being included in the Contract Price at the time of bidding. Unclassified excavation work does not include drilling or blasting operations, unless otherwise specified in the Technical Specifications.

Section 4.05. PROJECT RECORD DOCUMENTS.

The Contractor shall maintain at the Site such Project record documents as are required by the Contract Documents.

At a minimum, the Contractor shall maintain one record copy of all drawings, specifications, addenda, work authorizations, change orders and other modifications, in good order and marked currently to record all changes made during construction, and accepted submittals.

With his request for final payment, the Contractor shall submit such record drawings to the Contract Administrator for approval. The contractor shall make all corrections necessary to produce accurate and complete record drawings showing the "as-built" Project.

The Project Record Documents shall be kept accurately and currently to show the precise locations and depths below finish grade of all components of the Project, as constructed.

Section 4.06. CONTRACTOR'S SUPERVISION AND COORDINATION OF THE WORK.

It is the Contractor's basic responsibility to execute and complete the Work necessary to construct the Project as intended by the Contract Documents, whether the Work is being performed directly by the Contractor, or by subcontractors of the Contractor. In all cases, the Contractor shall cooperate reasonably and in good faith with the Contract Administrator to the end that unnecessary Clarification requests are avoided, and the Work flows smoothly to a fully completed Project for the Contract Price, within the Contract Time.

The Contractor is responsible to thoroughly review and become familiar with the Contract Documents, and to identify conflicts, internal inconsistencies and/or ambiguities claimed by the Contractor to exist in the documents. By execution of the Agreement for Construction, the Contractor represents that it is fully competent, skilled and experienced to secure the performance of all Work needed to complete the Project intended and will utilize fully such competence, skill, and experience in interpreting the Contract Documents to produce the results intended. Prior to requesting a Clarification, the Contractor shall exert its best efforts to resolve problems in the field.

The Contractor is responsible to supervise and coordinate the work of all subcontractors. The Contractor shall exert its best efforts to resolve problems presented by Subcontractors.

The Contract Administrator shall consider no request by Contractor for a Clarification on its own behalf or on behalf of a subcontractor unless the request details the Contractor's efforts to resolve the issue, the results thereof, and demonstrate that the Contractor's efforts comply herewith. In all such cases, the Contract Administrator reserves the right to require the Contractor to make additional efforts to resolve the issue rather than issuing a Clarification.

Section 4.07. CLARIFICATIONS AUTHORIZED.

The Contract Administrator is authorized to furnish during the progress of the Work such Clarifications as the Contract Administrator deems are necessary to make clear and to define in greater detail the intent of the Contract Documents. Such Clarifications shall be incorporated by reference into the contract Documents, and the Contractor shall make his Work conform to all such Clarifications. In the event of conflict between the original Contract Documents and subsequently issued Clarifications, the Clarification most recently issued shall control.

Section 4.08. CLARIFICATIONS; PROCEDURE.

A. **Contract-Initiated Requests.** Should the Contractor discover any conflicts or errors in the Contract Documents, or have any question concerning interpretation or clarification of the Contract Documents; or if it appears to the Contractor that the Work to be done or any matters relative thereto are not sufficiently detailed or explained in the Contract Documents; and provided that the Contractor has exerted its best efforts to interpret the Contract Documents and resolve the issue as required by Section 4.06; then before proceeding with the Work affected, the Contractor shall notify the Contract Administrator and request a Clarification.

The Contractor's request for Clarification shall be in writing, accompanied by sketch drawings and the materials necessary to explain and illustrate the problem in detail, and shall explain the Contractor's previous efforts to resolve the issue and the results thereof.

If the Contractor has proceeded with Work which was eligible for a clarification, but regarding which the Contractor failed to request a clarification, the Contractor shall not be entitled to, nor shall it request, any adjustment to the Contract Price or Time, caused by or resulting from such Work. The Contractor proceeds with such Work at its own risk, and shall make good any resulting damage, defect or extra work produced by such work.

B. **County-Initiated Clarifications**. At any time, the Contract Administrator may issue Clarifications to explain the Work more fully. The Contractor shall perform the Work as required by the Clarification.

C. **Incorporation in Contract**. All duly issued Clarifications shall become part of the Contract Documents upon delivery to the contractor.

D. **Procedure for Extra Work Claims**. If the Contractor contends that any clarification requires Work beyond the Scope of the Agreement, the procedures in Section 17.05 shall be followed.

Section 4.09. CONTRACT ADMINISTRATOR'S INVESTIGATION AND RESPONSE TIME.

Upon receipt of Contractor's request for a Clarification, the Contract Administrator shall conduct such investigations as he deems appropriate, including consultation with the Project Architect as necessary to decide the Contractor's request for Clarification.

In all cases, if the request is incomplete or does not demonstrate the Contractor's compliance with this Article, the Contract Administrator may reject the request unprocessed, and return it to the Contractor. There shall be no time extension on account thereof.

Within fourteen (14) days following receipt of the Contractor's fully documented request for Clarification, the Contract Administrator shall issue his written response to the Contractor. If the Contract Administrator rejects the Contractor's request for Clarification, the Contractor shall perform the Work in accordance with the Contract Documents.

If the contract Administrator issues a Clarification, the Contractor shall perform the Work in accordance with the Clarification.

Section 4.10. DISPUTE AS TO SCOPE OF CONTRACT DOCUMENTS.

If the Contractor contends that any Work required by a clarification is outside the Scope of the Contract Documents as specified in section 4.01, the Contractor shall, within five (5) days of receipt of the Clarification, submit a written request for a Change Order to the Contract Administrator.

Such request shall specify all details of why the Contractor contends that the Work exceeds the Scope of the Contract Documents, and shall include an estimate by the Contractor of the cost to perform the Work, which complies with Section 16.05 hereof, and of the time to perform the Work, which complies with Section 3.08 hereof.

Upon timely delivery of a request by the Contractor, the Contract Administrator shall, within fourteen (14) days, consult with the Project Architect, as needed, and respond to the Contractor's request.

Such response shall either confirm the original Clarification, as within the scope of the work, and order the Work to be performed with no extension of time or increase in contract amount, or approve the Contractor's request, in which case a work Authorization will be issued, if authorized by Section 16.03 hereof, or Change Orders will be processed to adjust the Contract Price and/or Time equitably.

The Contractor acknowledges that the purpose of this Section is to allow the County advance Notice of Contractor's contention that a Clarification is beyond the Scope of the Agreement, so that the County may reconsider the Clarification before the Clarification Work is incorporated in the Project and such reconsideration is futile. Therefore, the Contractor agrees that if it proceeds with such Work without providing such Notice or before the Contract Administrator's response, the Contractor does so at its own risk and cost. Extra costs and/or time caused by or resulting from such Work shall be at the Contractor's expense, and the Contractor shall make good any resulting damage, defect, or extra Work produced by such Work.

ARTICLE 5.

SUBMITTALS.

Section 5.01. REQUIRED SUBMITTALS; TIME.

No portion of the Work requiring submittals shall be commenced until the submittal has been accepted by the Contract Administrator. Should the Contractor proceed with any work requiring a submittal before acceptance thereof, the Contractor shall remove and replace any Work which is not in accordance with the Contract Documents and shall bear the risk of loss due to resulting damage, defects, or added costs.

The Contractor shall provide all submittals required by the Technical Specifications in accordance with the procedures set forth in the Contract Documents 1.

All submittals shall be complete in every respect and shall include all information required both by the particular Technical Specification section and the Contract Documents.

The Contract Administrator shall not process submittals that are not complete in all respects, legible, reproducible, and sufficiently dimensioned and detailed to demonstrate compliance with the Contract Documents.

The Contract Administrator may reject all or any portions of a submittal which fails to comply with the Contract Documents, and the Contractor shall resubmit the entire submittal or the rejected portion, whichever is ordered by the Contract Administrator.

The Contractor shall be entitled to no Contract Time or Price adjustment for delays occasioned by the failure of the Contractor's submittals to comply with the Contract Documents.

Section 5.02. TIME FOR SUBMITTALS.

A. Time Generally. All submittals shall be submitted by the Contractor at the time specified by the Contract Documents, and the applicable portions of the Technical Specifications; provided, however, that in all events, Contractor shall submit all submittals so as not to cause a delay in the Work, including a reasonable time for review by the Contract Administrator. Unless otherwise specified in the Technical Specifications, the time for review by the Contract Administrator shall be no more than twenty-one (21) days.

B. **Submittals within Twenty-One (21) Days Following Notice to Proceed**. Within the first twenty-one (21) days following issuance by the County of a Notice to Proceed, the Contractor shall make the following submittals, including all information required by the General Conditions, Section 01340 of Division 1, and all other the applicable Technical Specifications:

1) All data required by the Contract Documents to substantiate a Request for Substitution.

2) Proposed substitutions, with all substantiating data, for all materials listed as "unavailable materials" on the Contractor's initial submittal, pursuant to Section 3.02-A hereof.

3) A critical path schedule, if required by the Contract Documents.

4) Any other submittals requested by the Contract Administrator to be received within the first 21 days following issuance of a Notice to Proceed.

C. **Submittals After 21 Days Following Issuance of the Notice to Proceed**: All other submittals required by the Contract Documents shall be submitted in conformity with the time requirements thereof, and in no event later than specified on the schedule of submittals approved pursuant to Section 3.02-G hereof.

Section 5.03. CONTRACTOR'S RESPONSIBILITIES REGARDING SUBMITTALS.

The Contractor shall review and approve all submittals, including those originating with subcontractors and suppliers, before submitting them to the Contract Administrator.

By making a submittal, the Contractor represents that it has determined and verified all materials, field measurements, and field construction criteria related thereto, and that it has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

It is the Contractor's responsibility to specifically point out any variation or discrepancy between submittals and the Contract Documents, or between a re-submittal and the notations on the original Submittal. The Contractor shall make specific mention of all such variations, along with an explanation of why they are requested, in his letter of transmittal.

Failure by the Contractor to identify in his letter of transmittal with the submittal any variation, discrepancy, or conflict with the Contract Drawings shall render acceptance of the submittal null and void, and the Contractor shall bear all risk of loss and reconstruction costs or delays.

The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Contract Administrator's action on a submittal unless the contractor has complied with this section and the Contract Administrator expressly authorizes such deviation.

If any plumbing, mechanical, electrical, or structural modifications are required as a result of submittals that do not comply with the Contract Documents, such modification shall be made without extra cost to the County, and without extension of the Contract Time.

Section 5.04. ACTION ON SUBMITTALS.

The Contract Administrator shall take one of the following actions on a submittal:

"APPROVED": Fabrication, manufacture, or construction may proceed providing submittal complies with Contract Documents.

"APPROVED AS NOTED": Fabrication, manufacture, or construction may proceed providing submittal complies with Project Architect's notations thereon and Contract Documents. If for any reason the Contractor cannot comply with notations, the Contractor shall resubmit as described for submittals stamped **"REVISE AND RESUBMIT"**.

"REVISE AND RESUBMIT": Submittal does not comply with Contract Documents, and fabrication, manufacture, or construction shall not proceed. The Contractor shall make a new submittal conforming to the Contract Documents. Submittals stamped **"REVISE AND RESUBMIT"** shall be attached as an Exhibit to the re-submittal(s) for the specified items.

"NOT APPROVED": Fabrication, manufacture, product and/or construction does not conform to Contract Documents. Such fabrication, manufacture, product or construction shall not proceed and

are not permitted on the site. The Contractor shall make a new submittal, including a new proposed for fabrication, manufacture, product and or construction conforming to the Contract Documents.

"NO ACTION REQUIRED: Submittal is not required by this contract for this material or product. If Contractor wishes comment on this particular material or product, a submittal of a letter from Contractor explaining his purpose for submittal should accompany any future submittal.

Approval is only for conformity with the Design concept of the Project and compliance with the intent of the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

Section 5.05. EFFECT OF ACCEPTANCE OF SUBMITTALS.

The acceptance of submittals shall not relieve the Contractor of any obligation for quantities, accuracy of dimensions and details for property coordination, fitting and construction of the Work; for errors or omissions in the submittals; for conforming the Work to the requirements of the Contract Documents and all applicable laws and regulations; or from responsibility to fulfill the Contract at no extra cost to the County, within the Contract Time.

The County will review submittals for conformity with the Contract Documents, and acceptance thereof operates only with reference to such conformity. The County will attempt to discover errors, but the responsibility for accuracy and completeness of all submittals is the Contractor's.

After a submittal has been accepted, the Work shall proceed in accordance therewith.

The acceptance of samples provided with submittals shall be for the characteristics thereof, for the uses named in the action on the submittal, and for no other. Acceptance of samples shall not constitute a modification in any requirement of the Contract Documents unless expressly so noted, nor shall it relieve the Contractor of its obligation fully to perform the Agreement for Construction. All material or work installed after acceptance of a sample shall be equal or better than the sample in all respects.

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ARTICLE 6.

MATERIALS; STORAGE; PAYMENT; CERTIFICATIONS.

Section 6.01. QUALITY OF MATERIAL AND PRODUCTS.

The Contractor shall, if required by the Contract Administrator, furnish satisfactory evidence as to the kind and quality of materials provided in addition to the submittals required by the Technical Specifications.

The Contract Administrator may require, and the Contractor shall submit, a list designating the source of supply of each item of material entering into the Construction of the Work, and in such event, such materials or products shall not be delivered to the Work nor installed therein until after the Contract Administrator has approved such list.

Section 6.02. BETTER MATERIAL OR PROCESS.

In the Event that Contractor furnishes a material, product, process or article better than that specified in the Contract Documents, the difference in cost of such material, product, process or article shall be borne by the Contractor, unless the County previously specifically authorized the use of such item and a Contract Price adjustment therefore.

Section 6.03. INDUSTRY STANDARDS.

Unless otherwise specified in the Technical Specifications:

A. Any material specified by reference to a number, symbol or title or a specified standard such as a Commercial Standard, a Federal Specification, a Trade Association Standard, or other similar standard, shall comply with requirements in the latest revision thereof including any amendments or supplement thereto, in effect on the date of the Contractor's Bid, except as limited to type, class or grade, or modified in such reference.

B. The standard referred to, except as modified in the Specifications, shall have full force and effect as though printed in these Specifications. These standards are not specified in detail for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements.

1) Where Federal Specifications are referred to as a measure of quality and standard, they refer to Federal Specifications established by the Procurement Division of the United States Government and are available from the Superintendent of Documents, U.S. Government Printing Office.

2) Where Federal Specification numbers are used, they refer to the latest edition including amendments thereto.

3) Where Commercial Standards or Product Standards are referred to as a measure of quality, standard and method of fabrication, they refer to Commercial Standards and Product Standards issued by the U.S. Department of Commerce.

4) Where industry standards numbers are used, they refer to the latest tentative specifications, standards specifications, standards method or standard methods of testing, issued for example by the American Society for Testing Materials, unless specifically noted.

See Section 01 42 13 - Standard Abbreviations and Symbols for details on Abbreviations and Symbols.

Section 6.04. MATERIALS AND PRODUCTS STORAGE.

The Contractor shall confine the storage of all materials, products and equipment required in the performance of the Work to the area specified on the contract Drawings.

The County reserves the right, at the sole discretion of the Contract Administrator, to require materials to be stored off the Site in a bonded warehouse or other approved location. The County shall provide such location free of charge to the Contractor, or the Contractor shall be entitled to a Contract Price change order to off-set the actual cost thereof as defined in Section 17.02-D. Contractor shall not be entitled to overhead and profit on the rent of such facility.

The Contractor is admonished that the County has no obligation to provide a secure warehouse or other storage facilities; the Contractor takes the sole risk of loss or vandalism to any products or materials stored anywhere other than in a warehouse provided by the County.

All materials and products shall be stored in accordance with their manufacturers' instructions, with seals and labels intact and legible.

All materials, supplies and equipment to be incorporated in the Work shall be new, unless otherwise specified; of the type, capacity and quality specified; and free from defects. All materials shall remain in their original packages or containers until ready for use. The labels of all packages or containers shall remain affixed and shall be kept legible.

The Contractor shall protect the Work, materials and equipment from damage due to action of the elements, trespassers, and other causes. It shall properly store materials and equipment and, when necessary or when specified by the Technical Specifications, erect such temporary structures as is required to protect them from damage.

Section 6.05. TIME FOR DELIVERY OF MATERIALS: EARLY DELIVERY.

A. **Basic Requirement:** Unless early delivery is authorized by the Contract Administrator pursuant to Subsection B. hereof, the Contractor shall limit delivery of materials and equipment to the Site to those materials and/or equipment needed for installation within thirty (30) days of the date of delivery. The Contract Administrator shall refuse payment for materials delivered to the Site that are not intended to be used within thirty (30) days of the date of delivery.

B. **Early Delivery of Materials:** The County reserves the right to allow an earlier delivery date of any materials and/or equipment. Upon inspection and approval as specified below, the Contractor shall be entitled to progress payments therefore as specified in Section 23.01.

Upon application by the Contractor, the Contract Administrator, in his sole discretion, may authorize early delivery of materials and/or equipment, and payment therefore, subject to the following requirements:

1. For purposes of this Section, "materials and equipment" eligible for payment are defined as finished goods made specifically for the Project and requiring extensive time to be manufactured or obtained. Raw materials or work in progress and not yet delivered to an approved storage location are not eligible for payment. Finished items that are readily available for purchase are not eligible for payment.

2. The Contractor's request shall demonstrate that the proposed early payment is in the best interest of the Project by accomplishing time and/or money savings.

3. In his application for payment for such materials, the Contractor shall separately list the items for which payment is sought pursuant to this subsection. No payment shall be authorized unless the Contractor demonstrates that he is the unconditional owner of the equipment or material and executes a transfer of title to such equipment or material to the County with each request for early payment.

4. The materials for which a progress payment has been received shall be fully insured, with the County named as co-insured, segregated from the manufacturer's other work in progress and raw materials at the manufacturer's place of storage, and separately identified as being the property of the County of Yolo. Such insurance shall be primary, and the County's Builders' Risk insurance secondary.

5. The County retains the right to conduct inspections of such materials either during fabrication or during storage, at the manufacturer's plant or place of storage. The Contractor shall retain all risk of loss for such materials, however.

6. Payments for such materials shall be due only after such materials have either been delivered to the job site or to a storage location acceptable to the County, except that such payments shall not be included in the value for work in place for the purpose of calculating payments for labor and mark up.

7. The County reserves the right to specify requirements in addition to those stated above regarding early payment for materials. Such requirements shall be listed on the Contract Administrator's consent for early payments; the Contract Administrator hereby is authorized to provide such consents, with additional requirements, as are deemed necessary to protect the County.

Section 6.06. SPARE PARTS AND MAINTENANCE MATERIALS.

The Contractor shall provide spare parts and maintenance materials as required by the Technical Specifications.

Section 6.07. PROVIDING AND PAYING FOR MATERIALS, ETC.

Except as otherwise specifically stated in the Contract Documents, Contractor shall provide and pay for all materials, products, articles, processes, tools, equipment, and installation, and all associated superintendence of every nature whatsoever necessary to execute and complete the Work within the specified time.

Section 6.08. WARRANTY OF TITLE.

No material, article, product, supplies, or equipment for the Work under this Agreement shall be subject to any chattel mortgage, or a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier.

The Contractor warrants that, upon demand by County at any time after a progress payment has been made therefore, the Contractor will deliver to the County clear title to any materials, supplies, and/or equipment for which such progress payment was made, but which has not as yet been incorporated into the Work, such title to be free from any claims, liens, or changes, save only the Contractor's claim for the 10% withhold attributable to such materials, supplies, or equipment.

The Contractor further warrants clear title to all material, supplies, and equipment installed or incorporated in the Work, and agrees upon completion of the Work to deliver the premises, together with all

improvements and appurtenances, constructed or placed thereon pursuant to the Agreement for Construction, to the County, free from any claims, liens, or charges.

The Contractor agrees that neither he nor any person, firm or corporation furnishings any materials or labor for any Work pursuant to the Agreement for construction shall have any right to a lien upon the premises or any improvement or appurtenances thereon; provided, however, that nothing contained in this section shall defeat or impair the rights of persons furnishing materials or labor under the Payment Bond posted by the Contractor, nor any rights covered under any law permitting such persons to look to funds due to the Contractor but withheld by the County.

This section shall not disallow the Contractor's installing any devices or equipment of utility companies or of governmental agencies, the title to which is commonly retained by the utility company or the agency.

Section 6.09. PATENTS AND ROYALTIES.

All fees, claims, or royalties for any patented or copyrighted invention, article, arrangement, or plan that may be used upon or in any manner connected with the doing of the Work or any part thereof shall be included in the price bid for doing the Work. The Contractor and his sureties shall protect and hold harmless the County and all of its officer, agents, and employees against any and all demands made for such fees or claims and against any and all suits, demands, claims, or causes of action brought or made by the holder of any invention, patent, copyright or trademark, or arising from any alleged infringement of any invention, patent, copyright, or trademark.

Before final payment, the Contractor shall furnish acceptable proof to the Contract Administrator of proper release from all such fees or claims.

Section 6.10. PAYMENT OF FEDERAL OR STATE TAXES.

Any Federal, State, or local tax, specifically including sales and use taxes, payable on materials incorporated in the Work shall be included in the Contract price and paid by the Contractor.

The County will furnish the contractor with a certificate, on forms provided by the Contractor, to the effect that such materials are for the exclusive use of the County.

Section 6.11. PRODUCT CERTIFICATION.

Where required by the Technical Specifications, the Contractor shall submit proper product Certifications, which demonstrate the product's conformity to the Technical Specifications. Article 5 shall apply thereto.

ARTICLE 7.

PRODUCT OPTIONS AND SUBSTITUTIONS.

Section 7.01. APPLICABILITY OF ARTICLE.

This Article authorizes the Contractor to request substitutions of equal materials pursuant to Public Contracts Code Section 3400. Applications for such Substitutions shall be considered by the County only if the contractor's submittal is received within the time and includes all information specified herein and in the Contract Documents.

The Contractor is responsible to file all such requests on behalf of all subcontractors and product supplies; the County shall consider no request filed by a subcontractor or product supplies.

Only one request for Substitution shall be considered for each product specified. If the Contractor's request for Substitution is denied, the Contractor shall provide the specified first preference product.

Section 7.02. EFFECT OF BRAND NAME MATERIALS SPECIFICATION.

Unless otherwise expressly specified, whenever in the Contract Documents any materials, products, processes or articles are indicated or specified by the name brands of the manufacturers or products, or by patent or proprietary names, such Specifications shall be deemed to be followed by the words, "or equal", unless the specification expressly states that there is no known equal, or that the particular product specified is a unique or novel product application required to be used in the public interest. When materials are specified by reference to brand names, such specification is intended to incorporate all specifications of the listed brand as the measure of the type, quality and utility of the material so specified, and is not intended to limit the bidding, directly or indirectly, to any one specific concern.

Section 7.03. NECESSITY FOR SUBSTITUTION REQUESTS.

If materials are specified only by reference to standards, with no brand or proprietary trade name listed, any product meeting the specified standards may be provided, and no request for Substitution is required. No product not meeting the specified standards shall be provided unless a change order is approved so authorizing.

If materials are specified by listing more than one manufacturer or product, and the specification does not list one as the first preference manufacturer or product and the others as optional, any manufacturer or product listed may be provided, and no request for Substitution is required. If material is proposed other than the listed manufacturers or products, a Substitution shall be proposed by the Contractor pursuant to this Article.

Section 7.04. TIME FOR REQUESTING SUBSTITUTIONS.

All requests for Substitutions shall be submitted to the Contract Administrator no later than thirty-five (35) calendar days from the date of the Award of Contract. Thereafter, this Article shall be of no further effect, and the Contractor shall provide only the material specified.

Any further requests to provide materials other than those specified shall be treated as Change Orders, subject to Article 16. The County reserves the right to refuse to accept applications for such Change Orders and has no obligation to review such applications. Such applications shall not be accepted for review unless the Contract Administrator has previously determined that it is in the County's best interest to do so.

Section 7.05. APPLICATION FOR SUBSTITUTIONS; CONTENTS.

Applications for Substitutions shall be accepted for review only if the application is timely filed, and includes the following information:

A. All Technical Specification Section Number(s) where the material is specified;

B. If the material is proposed as an "or equal" Substitution, submittals to demonstrate that the material in fact is equal in all respects to that specified or, if applicable, to the first preference specified, including detailed drawings, construction specifications, performance specifications and warranty information for the material proposed for Substitution.

C. Complete Working Drawings and specifications demonstrating how the Substitution is to be incorporated into the Work so that the system of which the substituted material is a component will be a coordinated system fully compatible with all related systems, in conformity with the intent of the Contract Drawings.

D. Complete identification of all changes in related Work necessary to accommodate the Substitution, including but not limited to structural, mechanical and electrical changes.

E. Cost information necessary to evaluate the net difference in cost of the specified material against that proposed for Substitution, including the supplies' cost quotations and the Contractor's labor estimates.

F. Contractor's written assurance that the material is in fact equal in all respects to the material specified, or if applicable, the first preference specified; and that if the Substitution is accepted, the Contractor will bear all costs of incorporating the substituted material into the Work to provide a complete system which conforms to the design intent; and that no Contract Price or Time increase will be sought by Contractor on account thereof.

Failure by the Contractor to identify all deviations from the Contract Documents in his request for Substitution shall render any County action taken thereon null and void. Contractor shall bear all costs resulting from any error in the request for Substitution.

Section 7.06. ACTION ON REQUEST.

Within twenty-one (21) days of receipt of complete submittals requesting a Substitution, with all supporting data necessary to evaluate the request, the Contract Administrator shall evaluate and act on the request. The decision of the Contract Administrator shall be final. No Contract Time Extensions shall be allowed on account of an incomplete request for Substitution or the timely decision on such request.

The Contract Administrator shall authorize a Substitution only if he finds that the material requested is equal in all respects to that specified and is consistent with the design intent of the Contract Drawings.

The Contractor shall bear the burden of proving to the County's satisfaction that the material proposed in the substitution request is of equal quality and performance to the originally specified material in all respects and is compatible with the design intent.

The Contract Administrator's evaluation shall consider, but is not limited to, the following factors:

A. All product data for the originally specified material as against that for the requested Substitution;

B. The compatibility of the substitution with the remaining components of the system(s) of which it is a part.

C. The conformity of the Substitution with the design intent.

D. The length and terms of the warranties for the material proposed in the Substitution.

E. The net cost advantage to the County for granting the Substitution request.

Section 7.07. SAMPLES AND TESTING OF PROPOSED SUBSTITUTIONS.

If the Contract Administrator determines that samples and/or testing are required to decide a request for a Substitution, he shall so advise the Contractor, and specify the materials or work to be sampled and/or tested. The Contractor shall at no cost to the County, provide such samples and testing as required to evaluate the requested Substitution. The results of the testing shall be evaluated by the Contract Administrator before action on the Substitution request. The time during which the sampling and testing is being conducted shall not be included within the time specified in Section 7.06.

Section 7.08. DESIGN COSTS FOR SUBSTITUTION.

If a Substitution is accepted, Contractor shall bear all costs associated therewith, including the cost of architect's and/or engineer's services required to adapt the substitution to the design to the complete satisfaction of the County, and all costs of mechanical, electrical, structural or other changes needed to adapt the Substitution to the Work. Contractor shall also bear all cost increases to the County for construction management services being provided to the County by independent contractors, resulting from the substitution.

Section 7.09. EFFECT OF ACCEPTANCE.

If a Substitution is accepted, the Contractor shall be solely and directly responsible for setting accepted substituted materials and/or equipment and systems into the available space, and for the proper operation of the substituted equipment with all other equipment with which it may be associated, all in a manner acceptable to the County and which conforms to the design intent.

No time extension shall be granted on account of a Substitution. The Contract Price shall be adjusted by the price difference between the accepted Substitution and the originally specified (first preference) material. Neither acceptance nor rejection of a Substitution request shall relieve the Contractor of any obligation to perform the Agreement for Construction according to its terms, other than as expressly modified by the accepted Substitution.

ARTICLE 8.

SAMPLES, TESTS AND TESTING LABORATORIES.

Section 8.01. CONTRACT COMPLIANCE TESTING; SAMPLES.

Materials and/or work that require sampling and/or testing to determine compliance with the Contract Documents are specified in the Technical Specifications. The Contractor shall bear the full cost of providing samples when required to perform the specified tests, and shall take, store and provide such samples in the manner specified in the Technical Specifications, including Division 1.

All such samples shall be selected by the Contract Administrator or the Testing Laboratory employed by the County.

Section 8.02. DELIVERY OF SAMPLES.

The Contractor shall, at his sole cost and expense, furnish, package, mark, and store all samples to be tested. Chain-of custody and sample security precautions shall be utilized, as specified or as instructed by the Contract Administrator.

Collection, preparation, curing and delivery of all samples shall be made in ample time to allow the test to be made without delaying construction. No extra time will be allowed for the completion of the Work by reason of delay in testing.

Section 8.03. TESTING LABORATORY; COSTS.

The County shall employ and pay for the services of one or more independent testing laboratory(ies) ("Test Laboratory") to perform all required contract compliance testing expressly specified in the Technical Specifications as being provided by the County.

The County reserves the right to utilize the Yolo County Public Works concrete testing laboratory for any and/or all specified concrete or paving tests.

All testing not specified as being provided by the County shall be provided by the Contractor, using testing agencies with the specified qualifications.

The County reserves the right to require the Contractor to provide samples and to perform tests in addition to those samples and/or tests specified in the Technical Specifications. In the event the County orders such additional samples and/or tests, the County shall be obligated to pay therefore only if the sample and/or test is acceptable. If the sample and/or test does not comply with the Contract Documents, the County shall deduct the cost of the extra testing, and any subsequent re-testing, from the next progress payment.

If the Contractor determines that testing in addition to that specified is necessary and/or convenient, the Contractor shall employ a separate testing laboratory. The results of such tests shall not be binding on the County.

Section 8.04. RE-TESTING.

If as a result of any test, whether originally specified or not, any material or work is found to be unacceptable, it shall be rejected, and the original test and all further sampling and testing required by the

County shall be at Contractor's expense. Re-testing shall not be charged against the specified contingency or testing allowances, if any.

Section 8.05. ACCESS TO SITE; COOPERATION.

The Contractor shall allow free access at all times to the representatives of the County's testing laboratory or consultant to the Work, or to any off-site area where Work is being performed and shall point out the sources from which samples are taken.

The Contractor shall cooperate with the testing laboratory to facilitate execution of its services and shall provide quantities of samples as specified.

Section 8.06. DAMAGE DUE TO TESTING.

Contractor shall, at his sole cost and expense, repair all damage resulting from testing or retesting specified in the Contract Documents. The County shall issue a Contract Price adjustment for repair of damage due to sampling or testing in addition to that specified in the Contract Documents, if and only if the additional testing shows full compliance with the Contract Documents; otherwise, the Contractor shall be obligated to repair such damage.

Section 8.07. RESULTS OF SAMPLING/TESTING.

No materials or work of which samples and/or tests are required shall be used or covered until the Contract Administrator approves such samples and/or tests. If the Contractor installs, uses or covers any such material, article or work prior to testing and approval, such shall be at Contractor's sole risk and expense, and he shall bear all costs of uncovering, repair and replacement thereof.

Upon testing of any sample of material or work, no additional sample shall be considered.

Section 8.08. EFFECT OF SAMPLING AND TESTING.

The County assumes no obligation, and the Contractor shall be relieved of no obligation undertaken pursuant to the Agreement for Construction, by virtue of sampling and testing specified in this Article. The responsibility for incorporating satisfactory materials and workmanship, which meet the Contract Documents, into the Work rest entirely with the Contractor, notwithstanding any prior samples or tests.

The Contractor is not relieved of this obligation by virtue of the results of any test or the failure of the testing laboratory or consultant accurately to ascertain or report test results.

Section 8.09. CODE COMPLIANCE TESTING; COSTS.

The Contractor shall bear all costs for all sampling and/or testing required by all agencies of jurisdiction regarding compliance of the Work with the Codes those agencies enforce. Examples include but are not limited to Building, Fire, Health, Air Pollution, and CALOSHA Code and regulation and compliance testing.

The Contractor shall arrange for and conduct all such testing in conformity with applicable codes and regulations and shall schedule the testing so as not to delay the Work.

ARTICLE 9.

REJECTION AND REPLACEMENT OF WORK AND MATERIALS.

Section 9.01. REJECTION OF MATERIALS AND WORKMANSHIP.

The County shall reject materials that are determined by the Contract Administrator to be defective or fail to comply fully with the Contract Documents, and workmanship that is not first-class, competent and workmanlike in all respects. Rejected workmanship shall be corrected satisfactorily and rejected materials shall be removed from the premise and replaced, all without cost to the County.

Section 9.02. REMOVAL OF REJECTED MATERIALS.

The Contractor promptly shall remove from the Site all materials that have been rejected.

Upon request by the Contract Administrator, the Contractor shall submit a statement of the source for rejected materials. The County reserves the right to notify such source that the specified materials have not been and will not be incorporated into the Work, and no claim or stop notice therefore will be recognized. The Contractor shall fully indemnify the County for any claims, costs, or demands made by any supplier regarding such materials. The County reserves the right to satisfy any such supplier's claims by issuing a warrant jointly payable to the Contractor and the supplier, the amount of which shall be deducted from the next progress payment due to the Contractor.

Section 9.03. FAILURE TO REMOVE REJECTED MATERIALS.

If the Contractor does not remove rejected materials within a reasonable time, fixed by the written notice from the Contract Administrator, the County may remove such materials and may store or return the materials to the supplier, all at the expense of the Contractor. Contractor shall also bear the cost of replacement of any work damaged due to the removal of materials pursuant to this Section.

Any materials removed and stored pursuant to this section shall remain the property and the responsibility of the Contractor, and it is the Contractor's obligation to dispose of such materials. Such materials shall not again be brought upon the Site or any County-approved storage facility.

Section 9.04. FAILURE TO CORRECT REJECTED WORK; WITHHOLD AND DEDUCTION.

If the Contractor fails to correct rejected workmanship and/or materials, the County may withhold the cost to correct the rejected work, and the value of the rejected materials, from the Progress Payments due the Contractor.

If the work is not corrected prior to recordation of a Notice of Cessation or Notice of Completion, the County shall process a Contract Price Change Order to decrease the Contractor's final payment by an amount equal to the cost to cure the defect, measured by the cost the County would incur to purchase and install the specified material, and/or to correct the faulty workmanship, to bring the Work into full compliance with the Contract Documents.

Section 9.05. RESERVATION OF RIGHTS.

The County's authority to reject work under this Article is in addition to all other County rights under the Agreement for Construction. Neither the County's action or inaction under this Article shall relieve the Contractor from any obligation under this Agreement, nor constitute a waiver by the County of any other right under the Agreement for Construction.

ARTICLE 10.

SUPERVISION AND LABOR.

Section 10.01. SKILLED LABOR.

All labor shall be especially skilled for the kind of Work required, shall be conducted under the direction of a competent foreman, and workmanship shall be of the highest quality and finish, competent and workmanlike in all aspects.

All workers shall meet the skill and experience requirements specified in the applicable sections of the Technical Specifications.

Section 10.02. NO TENANCY.

All workers, contractors, or Contractor's representatives are admitted to the Site only for the proper execution of the Work and have no tenancy.

Section 10.03. DISMISSAL OF UNSATISFACTORY EMPLOYEES.

All employees engaged in the Work will be considered employees of the Contractor.

The Contractor shall discharge, or cause a subcontractor to discharge, any incompetent employee, any employee not skilled for the type of work required, or any employee who violated the standard set forth in Section 10.06 habitually or flagrantly.

Section 10.04. PERSONAL ATTENTION AND SUPERINTENDENCE; CONTRACTOR'S AGENT.

The Contractor shall supervise the Work to the end that it shall be faithfully prosecuted.

The Contractor at all times keep a Project Superintendent, fully empowered to act as agent for the Contractor, on the Site or available by telephone and within a reasonable distance. Contractor shall advise the County in writing of its agent, and of any limitations on the agent's authority to act on behalf of the Contractor. Regardless of such limitations, the Contractor shall be responsible for the faithful observation of all instructions delivered to it or its Project Superintendent, and representations on behalf of the Contractor by the Superintendent shall be binding on the Contractor.

Section 10.05. AUTHORIZED COUNTY VISITORS TO THE SITE.

The Contract Administrator shall specify those individuals who are entitled to access to the Site.

If the Contractor has complaints regarding the presence or conduct of any authorized individual on the Site, the Contractor shall report such complaint to the Contract Administrator, and shall conform to the instructions of the Contract Administrator regarding the complaint.

After consultation with the Contract Administrator, the Contractor may enforce reasonable regulations to secure the safety of authorized visitors. Such regulations may include the requirements to check in at a designated location and wear "hard hats" in specified areas.

Section 10.06. RELATIONSHIPS OF EMPLOYEES AND COUNTY EMPLOYEES AND THE PUBLIC.

It is the policy of the County of Yolo and the law of this State that all County employees be free from sexual, racial, or other harassment at their workplace; it is the policy of the County that all members of the public likewise be free there from.

It is Contractor's responsibility to supervise all workers on this Project to the end that their conduct does not result in a violation of this policy.

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ARTICLE 11.

SUBCONTRACTORS; LISTING AND BID; SUBSTITUTION.

Section 11.01. SUBCONTRACTORS; CONTRACTOR'S SUPERVISION.

Nothing contained in the Agreement for Construction shall create any contractual relationship between any subcontractor and the County of Yolo. The County's only contract is with the Contractor.

The Contractor shall be as fully responsible to the County for the performance and/or omissions of all first-tier and lower-tier subcontractors and their employees and agents as it is for its own performance and omissions.

It is the Contractor's responsibility, not the County's, to resolve disputes between subcontractors and/or between the Contractor and subcontractors. The Contractor shall not simply refer issues raised by subcontractors to the Contract Administrator. Prior to referring any controversy, issue, or request made by any subcontractor to the County, the Contractor shall exert his good faith best efforts to resolve the issue. Upon referring any such request, the Contractor shall accompany it with a submittal specifying efforts taken by the Contractor to resolve the issue. Should the Contract Administrator determine that the Contractor has not satisfied his obligation pursuant to this section, the Contract Administrator may reject the Contractor's submittal. The Contractor shall not be entitled to either a Contract Price or a Contract Time Change Order as a result of such rejected submittal.

It is also the Contractor's responsibility to supervise all subcontractors' compliance with all safety, wage and hours, equal employment opportunity and related regulations, including reporting requirements.

The County shall not entertain any request for, nor engage in, arbitration or dispute resolution between subcontractors, subcontractors and the Contractor, nor any agency with Code compliance, safety, wage and hours, and/or equal employment opportunity jurisdiction. However, in the event of such dispute, the Contract Administrator may request the Contractor to provide a complete written explanation of all facts underlying the dispute and may attend or call any meetings between the disputing parties. The Contractor shall provide such information to the Contract Administrator upon his request.

The County shall not be liable to the Contractor for any claims by subcontractors, suppliers, laborers, workers, or any other person, including claims that are settled by and assigned to the Contractor. The Contractor shall indemnify, defend and hold harmless the County, its officers, agents and employees from and against any and all such claims.

Section 11.02. DISPUTES BETWEEN SUBCONTRACTORS AND/OR CONTRACTOR.

If, through acts of neglect on the part of the Contractor, including failure to supervise and control his subcontractors, any other contractor, subcontractor, or workman shall suffer loss or damage on the Work, Contractor agrees to settle with such other contractor, subcontractor, or workman by agreement or arbitration, if such other contractor, subcontractor, or workman shall assert any claim against the County of Yolo or any of its officers, agents, or employees, on account of any damage alleged to have been so sustained.

In the event of the receipt of any such claim, the County shall notify the Contractor, who shall defend, indemnify, and save harmless the County and all of its officers, agents, and employees against any such claim, pursuant to Section 2.05 hereof.

Section 11.03. LISTING OF SUBCONTRACTORS.

Contractor shall comply with the requirements in the Instructions to Bidders regarding the listing of subcontractors and shall comply with the requirements of the Subletting and Subcontracting Fair Practices Act, Public Contracts Code Sections 4100 and following, forbidding bid shopping and bid peddling and requiring accurate listing of all subcontractors.

Should the Contractor violate any provision of that Chapter, such violation shall be deemed a breach of the Agreement for Construction, and the County shall have all remedies provided by California law including, but not limited to, those provided in Public Contracts Code Section 4110, allowing termination of the Contract or a penalty assessment of 10% of the subcontract.

Section 11.04. TERMINATION OF UNSATISFACTORY SUBCONTRACTORS.

When any portion of the Work that has been subcontracted by the Contractor is not being prosecuted in a satisfactory manner, the Contractor shall terminate the subcontract for such work.

Any such subcontractor who is discharged shall not again be employed on the Project.

Any termination of a subcontractor pursuant to this section shall be in strict conformity with the Subletting and Subcontracting Fair Practices Act, Public Contracts Code Sections 4100 and following.

Section 11.05. SUBCONTRACTORS' INSURANCE.

All subcontractors shall procure and maintain the insurance required by Article 2 hereof. Contractor shall supervise subcontractors to enforce this requirement and shall allow no subcontractor to evade this requirement.

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ARTICLE 12.

STATE REQUIREMENTS REGARDING WAGES, HOURS, AND EQUAL OPPORTUNITY.

Section 12.01. PREVAILING WAGE RATE NOTICE

As provided under Labor Code Sections 1726-1861, the Director of the Department of Industrial Relations (DIR) of the State of California has determined the prevailing rate of wages in the locality in which the Work on the project is to be performed for each craft, classification, or type of Worker needed to execute this Contract. The prevailing rates so determined are on file with the COUNTY, and they are available for public inspection. They may also be obtained on the internet at http://www.dir.ca.gov/DIR/S&R/statistics_research.html. Those prevailing wage rates hereby are incorporated in this agreement and made a part hereof.

The CONTRACTOR shall obtain and post copies of these prevailing wage rates in a prominent place at the job site, in accordance with the regulations of the Department of Industrial Relations.

If the Project is subject to the requirements of Title 8 of the California Code of Regulations, Section 16461, the CONTRACTOR shall post on the jobsite a Notice containing the following language:

DIR will no longer charge awarding bodies for prevailing wage compliance monitoring and enforcement by the CMU.

SB 854 (2014) established a public Works CONTRACTOR registration program to replace prior Compliance Monitoring Unit (CMU) and Labor Compliance Program (LCP) requirements for bond-funded and other specified public Works projects.

- Pursuant to Labor Code section 1725.5 and 1771.3, contractors and subcontractors who intend to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No proposal will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. CONTRACTOR and its subcontractors, of any tier, shall maintain active registration with the Department of Industrial Relations for the duration of the project. Information is available at: http://www.dir.ca.gov/Public-Works/PublicWorks.html. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. In bidding on this Project, it shall be CONTRACTOR's sole responsibility to evaluate and comply with all labor compliance requirements and applicable laws in performing the Agreement for Construction.

Section 12.02. PAYMENT OF PREVAILING WAGE RATES.

Pursuant to Labor Code Section 1772, Workers employed by contractors or subcontractors in the execution of any contract for public Work are deemed to be employed upon public Work as defined in Labor Code Sections 1720-1725. Therefore, the CONTRACTOR shall pay, and shall cause all subcontractors, whether under contract with the CONTRACTOR or under contract with any subcontractor, to pay not less than the specified prevailing wage rates to all Workers employed in the execution of this Contract.

In accordance with Labor Code Section 1775, the CONTRACTOR shall monitor the payment of the specified general prevailing rate of per diem wages by subcontractors to employees by periodic review of the certified payrolls of the Subcontractors.

Section 12.03. WAGE RATES FOR CRAFTS NOT LISTED.

The responsibility to check prevailing wage rates is the CONTRACTOR's. Pursuant to Labor Code Section 1773, the CONTRACTOR may file with the Director of DIR or the Chief of the Division of Labor Standards Enforcement ("DLSE") a petition to review a determination of any rate or rates made by the Director of DIR. The CONTRACTOR may also petition the Director of DIR to make a determination for a particular craft, classification or type of Work not covered by a general determination. Pending the review or

determination, the wages may be assumed to be those in the applicable collective bargaining agreement, but no adjustment in the bid or Contract Price shall be made if such assumption is incorrect.

Section 12.04 RECORDS OF HOURS WORKED AND WAGES

The CONTRACTOR shall keep, and shall cause all subcontractors on the Project to keep, certified payroll records of the hours and wages of all employees employed on the Project, and those records shall be open at all times for inspection by the COUNTY and/or the Division of Labor Statistics and Enforcement, in accordance with Sections 1776 and 1812 of the Labor Code. The certified payroll records shall contain at least the following information: the name, address, social security number, Work classification, dates of payroll period, straight time, and overtime hours Worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, Worker, or other employee employed by the CONTRACTOR and/or each Subcontractor in connection with the Work.

In the event that the CONTRACTOR and/or any subcontractor fails to submit certified payroll records to the COUNTY within ten (10) calendar days of a request from the COUNTY for the records, the CONTRACTOR and/or the Subcontractor shall, as a penalty, forfeit one hundred dollars ($100) per calendar day, per Worker, until strict compliance is effectuated. These penalties shall be withheld from progress payments then due and/or to become due. The CONTRACTOR is not subject to this penalty assessment due to the failure of a Subcontractor to comply with these requirements if the CONTRACTOR can demonstrate that it has fully complied with the provisions of Labor Code Section 1776.

The CONTRACTOR shall not carry on its payrolls any person not actually employed by the CONTRACTOR, nor shall it carry on its payroll's employees of any Subcontractor. The CONTRACTOR shall show on its payrolls all persons actually employed by the CONTRACTOR on the Project, in any capacity. The CONTRACTOR shall cause all subcontractors on the Project, whether under contract with the CONTRACTOR or under contract with any subcontractor, to comply with this Section.

In accordance with Government Code Section 8546.7, or any amendments thereto, all books, records, and files of the CONTRACTOR, or any subcontractor connected with the performance of this Contract, shall be subject to examination and audit by the Auditor General for a period of three (3) years after final payment. CONTRACTOR shall preserve and cause all Subcontractors to preserve such books, records and files for the audit period.

Section 12.05. ADDITIONAL REQUIREMENTS FOR LABOR COMPLIANCE

In accordance with Section 16463 of Title 8 of the California Code of Regulations ("8 CCR Section 16463"), the COUNTY may, on its own or if required by the Labor Commissioner, withhold funds due to the CONTRACTOR when payroll records are delinquent or inadequate. The amount withheld shall be those payments due or estimated to be due to the CONTRACTOR or subcontractor whose payroll records are delinquent or inadequate, plus any additional amount that the Labor Commissioner has reasonable cause to believe may be needed to cover a back wage and penalty assessment against the CONTRACTOR or subcontractor whose payroll records are delinquent or inadequate. The CONTRACTOR shall cease all payments to a Subcontractor whose payroll records are delinquent or inadequate until the Labor Commissioner provides notice that the Subcontractor has cured the delinquency or deficiency. When payments are withheld under 8 CCR Section 16463, the Labor Commissioner will provide the CONTRACTOR and Subcontractor, if applicable, with immediate written notice that includes all of the following: (1) a statement that payments are being withheld due to delinquent or inadequate payroll records, and that identifies what records are missing or states why records that have been submitted are deemed inadequate; (2) specifies what amounts the CONTRACTOR has been directed to withhold; and (3) informs the CONTRACTOR or subcontractor of the right to request an expedited hearing to review the withholding of payments under Labor Code Section 1742, limited to the issue of whether the records are delinquent or inadequate or the Labor Commissioner has exceeded his or her authority under 8 CCR Section 16463. The withholdings under 8 CCR Section 16463 do not preclude assessment of penalties under Labor Code Section 1776(g) for failure to timely comply with a written request for certified payroll records, as set forth below.

Section 12.06 UNDERPAYMENT OF WAGES

The CONTRACTOR agrees that in the event of underpayment of wages to any employee on the Project, whether by the CONTRACTOR or any subcontractor on the Project, the COUNTY may retain from payments due to the CONTRACTOR, an amount sufficient to pay such Worker the difference between the wages required to be paid by the DIR, and the wages actually paid such Worker for the total number of hours Worked, plus any penalties and forfeitures. The COUNTY may disburse such retention to such employees.

Section 12.07. APPRENTICES.

Attention is directed to the provisions of Sections 1777.5, 1777.6 and 1777.7 of the Labor Code concerning the employment of apprentices by the CONTRACTOR or any subcontractor.

The CONTRACTOR and all subcontractors on the Project shall comply with the requirements of Sections 1777.5 and Section 1777.6 of the Labor Code in the employment of apprentices. Violation of these requirements shall subject the CONTRACTOR and/or subcontractor to the penalties set forth in Section 1777.7 of the Labor Code and/or otherwise provided by law or Contract.

Information relative to apprentice standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, ex-officio the Administrator of Apprenticeship, San Francisco, California, from the Division of Apprenticeship Standards or its branch offices, and/or on the DLSR website at www.dir.ca.gov/DLSR/PWD. Apprentices employed on the Project must at all times Work with or be under the direct supervision of a journeyman or journeymen.

Section 12.08 PENALTIES

In accordance with Articles 2 and 3, Chapter 1, Part 7, Division 2 of the Labor Code, particularly Sections 1775, 1776, 1777.7 and 1813, the CONTRACTOR shall forfeit to COUNTY as a penalty the sum specified below, over and above any retention or withholds otherwise authorized by the agreement, as follows:

A. Up to two hundred dollars ($200) for each calendar day, or portion thereof, for each Worker paid less than the applicable prevailing wages for any Work done by him/her under this Contract or under any subcontract on the Project, with the amount to be determined by the Labor Commissioner in accordance with the considerations set forth in Labor Code section 1775. If a Worker employed by a Subcontractor on the Project is paid less than the prevailing wages by the Subcontractor, the CONTRACTOR is not subject to this penalty assessment if the CONTRACTOR can demonstrate that it did not have knowledge of that failure of the Subcontractor to pay the prevailing wages and that it strictly complied with the requirements of Labor Code Section 1775(b).

B. Twenty-five dollars ($25) for each Worker employed in the execution of this agreement by the CONTRACTOR or by any Subcontractor on the Project for each calendar day during which such Worker is required or permitted to Work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of the provisions of Article 3.

C. Failure to provide certified payroll records to the COUNTY or, if applicable, to the CMU, within ten (10) calendar days of a request, shall, in addition to resulting in a withholding of payments due or estimated to be due, result in a penalty in the amount of one hundred dollars ($100) for each calendar day, or portion thereof, for each Worker until strict compliance is effectuated. The CONTRACTOR is not subject to this penalty assessment due to the failure of a Subcontractor to comply with these requirements if the CONTRACTOR can demonstrate that it has fully complied with the provisions of Labor Code Section 1776.

D. Knowing violation of Labor Code Section 1777.5 shall yield a penalty in an amount not exceeding one hundred dollars ($100) for each full calendar day of non-compliance. A CONTRACTOR or Subcontractor who knowingly commits a second or subsequent violation of Section 1777.5 within a

three-year period, where noncompliance results in apprenticeship training not being provided as required, shall forfeit as a civil penalty the sum of no more than three hundred dollars ($300) for each full calendar day of noncompliance.

Section 12.09. HOURS OF WORK AND APPROVAL OF SCHEDULES

Eight (8) hours of labor constitutes a legal day's Work, and forty (40) hours constitutes a legal Work week. No Worker employed at any time by the CONTRACTOR, or by any subcontractor upon the Project, shall be required or permitted to Work more than eight (8) hours in any one calendar day or forty (40) hours in any one week, except as provided in Labor Code Sections 1810 through 1815.

Overtime shall be paid at the rate of not less than one and one-half (1-1/2) times the basic rate of pay, or at such other rate as stated on the applicable Determination issued by the DIR, or as may be required by applicable statutes or collective bargaining agreements.

The COUNTY reserves the right to approve or disapprove the days scheduled for Work, and the hours during which Work is in progress.

Section 12.10. COMPLIANCE WITH THE STATE ANTI-DISCRIMINATION LAWS

The CONTRACTOR shall comply with Section 1735 of the Labor Code, which provides as follows:

> "A contractor shall not discriminate in the employment of persons upon public works on any basis listed in subdivision (a) of Section 12940 of the Government Code, as those bases are defined in Sections 12926 and 12926.1 of the Government Code, except as otherwise provided in Section 12940 of the Government Code. Every contractor for public Works who violates this section is subject to all the penalties imposed for a violation of this chapter."

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ARTICLE 13.

FEDERAL REQUIREMENTS REGARDING WAGES, HOURS, AND EQUAL OPPORTUNITY

SEE SUPPLEMENTARY CONDITIONS

ARTICLE 14.

ON-SITE SECURITY; RISK OF LOSS; SITE SAFETY.

Section 14.01. PROJECT SITE.

The Contractor shall confine his equipment, materials, and construction apparatus to the site limits designated in the Contract Documents and/or directed by the Contract Administrator.

The Site and equipment storage areas shall be kept in a neat and safe condition, conforming to all requirements of the Contract Documents and applicable Codes regarding the storage of materials, including flammable materials.

Section 14.02. SECURITY OF THE SITE.

The Contractor shall take such steps as are necessary to secure the Site at all times, including times workmen are not present. The Contractor shall maintain adequate security and protection of all structures, facilities, equipment, tools, materials, and any other property on or adjacent to the Site, against damage, vandalism, loss of fire, or theft.

The Contractor's attention is directed to the Technical Specifications and/or Supplementary Condition for specified fencing, screening, gate and lighting requirements, if any.

The Contractor may, at its option and expense, provide night watchmen for the Site. The facilities for such watchmen shall be subject to approval by all agencies with jurisdiction.

At the Contract Administrator's request, the Contractor shall meet with representatives of the police and fire agencies with jurisdiction and shall comply with the Contract Administrator's request on behalf of such departments regarding security of the Site.

Section 14.03. RISK OF LOSS.

The Contractor assumes full responsibility for site security and full liability for the risk of loss from any cause of materials stored, work performed and existing improvements on the site, and agrees to repair and replace, at no cost to the County, at the time they are needed for incorporation in the Work, any materials or work that may have become lost, damaged, destroyed, stolen, vandalized, or have otherwise been rendered unsuitable for use from any cause. Contractor shall repair or replace any such damage and remove any damaged or defaced materials and/or equipment from the Project Site, at no cost to the County, and Article 9 hereof shall apply to such material or equipment.

Section 14.04. PROTECTION OF WORKMEN AND VISITORS TO THE SITE.

Contractor shall take all necessary precautions for the safety of all employees and visitors to the Site and shall comply with all applicable provisions of the Federal, State and local safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the Site.

Contractor shall erect and properly maintain at all times, as required by the condition and progress of the Work, all necessary safeguards for the protection of workmen, visitors to the Site, and the public, and shall post danger signs warning against construction hazards as needed.

The responsibility for maintaining a safe site shall be the Contractor's and the County undertakes no obligation to suspend the Work or notify the Contractor of any hazardous condition or noncompliance with safety laws.

Contractor shall designate a responsible member of his organization on the Work, whose duty shall be the prevention of accidents. The name and position of persons so designated shall be reported to the

Contract Administrator by the Contractor; absent designation of some other individual by the Contractor, the Contractor's Project superintendent shall be responsible for the Contractor's safety program.

Contractor shall immediately replace or repair any unsafe, dangerous, or hazardous condition that may exist.

Section 14.05. EXCAVATION AND TRENCHING; SAFETY.

The Contractor shall comply with of all provisions of law regarding safety requirements for trenches or excavations.

A. Public Contract Code '7104 provides:

(a) That the contractor shall promptly, and before the following conditions are disturbed, notify the public entity, in writing, of any: (1) Material that the contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law; (2) Subsurface or latent physical conditions at the site differing from those indicated; (3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

(b) That the public entity shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the contractor's cost of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in the contract.

(c) That, in the event that a dispute arises between the public entity and the contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the contractor's cost of, or time required for, performance of any part of the work, the contractor shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract.

B. Labor Code Section 6705 provides that in advance of any excavation of any trench or trenches or other excavation five (5) feet or more in depth, the Contractor shall submit a detailed plan to the Contract Administrator for information only showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from California State Shoring System standards, the plan shall be prepared by a registered civil or structural engineer.

C. Nothing in the Contract Documents shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders of the State of California.

Nothing in this Section shall be construed to impose liability on the County of Yolo or any of its officers, agents, or employees, or to relieve the Contractor of its obligations to provide a safe site.

Section 14.06. CAL OSHA.

The contractor shall comply with all requirements of the California Occupational Safety and Health Administration or its successor, and the Federal equivalent, and shall provide a safe work environment for all workers employed on the Work, as required by such agencies. The Contractor shall supervise performance of the Work with all occupational health & safety requirements applicable to the type of work being done, and the materials and equipment being utilized. (See also Section 20.05).

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ARTICLE 15.

OFF-SITE SAFETY AND PROTECTION OF ADJACENT PROPERTY; INDEMNITY.

Section 15.01. PROTECTION OF ADJACENT PROPERTY DURING EXCAVATION OR OTHER OPERATIONS; NOTICES.

In addition to any requirements imposed by law, the Contractor shall shore up, brace, underpin, and protect as may be necessary all foundations and other parts of all existing structures on the Site or adjacent to the site which are in any way affected by the excavations or other operations connected with performance of the Work.

Not less than five (5) days prior to commencing any work which may detrimentally affect adjoining or adjacent land or buildings thereon, the contractor shall send the owner and occupants thereof a notice, which specifies the type of Work to be done, the schedule of the Work, the effects expected from the Work, and the protective measures being taken by the Contractor. A copy of the notice shall be sent to the Contractor Administrator.

The basic standard to determine whether the Work may detrimentally effect adjoining properties shall be whether the work will create noise, dust, vibration, and/or settling on such properties. Examples include, but are not limited to, blasting, pile driving and excavations within 30 feet of any structure not owned by the County.

The Contractor shall, at the instruction of the Contract Administrator, meet with any recipient of such notice to explain and discuss the proposed Work. The Contractor shall make such modifications to the proposed working methods as are required to comply with all provisions of law, and shall exert its best efforts to address the concerns expressed by recipients of such notices.

Section 15.02. UNDERGROUND UTILITIES; "USA".

The Contractor is responsible to coordinate all excavation work with the owners of existing underground utilities, and to avoid unintentional disruptions in services by those utilities. Locations of existing utilities shown on the Contract Drawings are schematic only and shall not relieve the Contractor's duty to precisely locate and avoid them.

If the underground utility service is disrupted by the Work, the Contractor shall take emergency action appropriate to the situation and immediately notify the owner of the utility. Repair thereof shall be the Contractor's responsibility, at no cost to the County.

The Contractor is advised that the County participates in the Underground Service Alert-Northern California ("USA"), which may be contacted by telephone at (800) 227-2600. Except in an emergency, the Contractor shall contact the USA Notification center at least two working days prior to commencing an excavation in any area that contains subsurface installations.

Section 15.03. DAMAGE TO OR BLOCKING STREETS, STREET IMPROVEMENTS AND TRACKS.

The Contractor is responsible to avoid damage to existing streets, sidewalks, curbs, traffic signs and signals, streetlights, control boxes, meters, railroad tracks, crossing guards, and all other appurtenances thereto. The Contractor shall take necessary precautions to avoid damage to such property, and if damage occurs, shall take emergency action appropriate to the situation and immediately notify the owner of the damaged property. Repair thereof shall be the Contractor's responsibility, at no cost to the County.

Existing traffic signs, lights, traffic signals, railroad crossing warnings, control boxes, hydrants, meters and related safety items occurring within the street and/or sidewalk area shall be kept visible, free of obstructions and accessible at all times.

Should it be necessary to cover up, move, or alter such items, this shall be done only with permission of the authorities having jurisdiction of the items involved.

Should it be necessary to block a street or sidewalk, the Contractor shall first notify the police, fire, or public works agencies with Jurisdiction, and shall comply with their instructions, including scheduling limitations.

Section 15.04. FIRE PROTECTION.

The Contractor is responsible to protect all structures from fires and sparks originating in the work, and all laws and regulations regarding fire protection, and shall comply with all instructions of the fire department with jurisdiction.

The Contractor shall notify the Contract Administrator and the fire department prior to disconnection of either water or electrical service to the Site, and shall comply with the fire department's instructions regarding fire safety.

The Contractor shall provide fire extinguishers as necessary to protect the Site and adjacent structures at all times, in accordance with applicable Fire Codes, regulations and Fire Department instructions.

Section 15.05. DUST CONTROL.

The Contractor shall at all times control dust originating from the Site by sprinkling as needed. The Contractor shall not allow dust to be blown onto adjacent properties. In the event that complaints are received by the County regarding dust control, the Contractor shall increase sprinkling to control the dust.

Section 15.06. INDEMNITY FOR DAMAGE TO ADJACENT PROPERTY; REPAIRS.

A. **Indemnity**. Without limitation of its indemnity obligations set forth in Article 3 hereof, Contractor shall defend, indemnify, and save harmless the County from any claim, loss or damages on account of any harm to person or property alleged to have resulted from the Work, the performance of this Agreement or Contractor's acts or omissions in protecting the public from the effects of the Work including settlement and/or the loss of lateral subjacent support of adjoining property; damage to utilities' or governmental agencies' equipment or installations; injuries to persons using the public streets; and from all loss or expense and from all damages for which the County may be liable as a consequence of such injury or damage to person an/or adjoining or adjacent property and/or structures' or equipment or installations, including those owned by Yolo County.

B. **Repairs**. Any damage arising from or in consequence of the performance of the Agreement for Construction to tracks, pavement, curbs, sidewalks, walls, stairs, sewage and/or drainage structures, mains, pipes, valves, conduits, poles, wires, transformers, trees, shrubs, adjoining work, or to any other improvement or property above or below the surface of the ground, whether private or public, shall be repaired at once by Contractor without expense to the County, if the owner thereof consents.

Section 15.07. EMERGENCY SAFETY ACTIONS.

In an emergency affecting the safety of life or property, including adjoining property, the Contractor, without previous instructions or authorizations from the County, shall act at the Contractor's discretion and risk to prevent such threatened loss or injury, and shall bear all costs of such action. The Contractor immediately shall notify the Contract Administrator of such actions, and thereafter shall comply with any instructions issued by the Contractor Administrator.

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ARTICLE 16.

CONDUCT AND PROSECUTION OF THE WORK.

Section 16.01. BASIC STANDARD.

The Contractor is responsible for all aspects of the full, complete, satisfactory and faithful performance of the Work strictly as specified by the Contract Documents or any duly issued amendments thereto as well as all applicable laws and regulations.

Section 16.02. SURVEYS AND FIELD ENGINEERING.

Unless otherwise specified, the Contractor is responsible for all survey and field engineering work required for performing the Work. All such survey and field engineering work shall conform to the Technical Specifications.

The County shall identify existing control points and property line corner stakes, as indicated on the Drawings. Benchmarks, baselines, property boundaries, line and grade hubs, and other reference and construction points shall thereafter be maintained by the Contractor who shall be responsible for keeping their accuracy and who shall pay all costs of re-establishing them if they are disturbed.

The Contractor shall notify the Contract Administrator in writing at least ten (10) days prior to the time he will commence work on any part of the construction requiring surveys to be commenced by the County.

Section 16.03. CLEARING OBSTRUCTIONS.

Unless specified otherwise, the Contractor shall clear all obstructions and prepare the site for the construction. The Contractor shall verify all dimensions and levels shown on the Drawings against the Site after it has been graded and prepare for construction, and properly reset all survey control points and property line corner stakes.

Section 16 04. LAYOUT WORK.

The Contractor shall be responsible for all layout work, and shall lay out all lines, corners, levels and grade stakes after the Site has been prepared. The exact locations of all partitions shall be laid out on forms, walls and flooring, as the Work progresses. It is the Contractor's responsibility to verify all dimensions shown on the Drawings before layout of the Work, and to properly locate the Project on the Site and the components within the structure, as specified by the Contract Documents.

Section 16.05. CONTRACTOR'S EQUIPMENT.

The Contractor shall provide adequate and suitable equipment and means of construction to meet all the requirements of the Contract Documents, including completion of the project within the time specified. The Contractor alone shall be responsible for the safety, adequacy, and efficiency of his plant, equipment and methods, and those of all subcontractors on the Site. By entering the Agreement for Construction, the Contractor agrees to provide all specialized plant, equipment and methods of construction required to perform the Work on schedule, whether separately specified or not, at no extra cost to the County.

Section 16.06. DISCOVERY OF UNKNOWN CONDITIONS; PROCEDURE.

Should concealed or unknown conditions be encountered in the performance of the work below the surface of the ground or in existing structures on the Site, which conditions are at variance with the Contract Documents, the Contractor immediately shall seek a Clarification from the Contract Administrator, pursuant to Section 4.08 hereof.

The Contract Administrator shall investigate, and if the Contractor has demonstrated the following, a Change Order shall be processed pursuant to Article 17:

A. The conditions are at variance with the Contract Documents; and,

B. The conditions require work beyond the Scope of the Agreement for Construction; and,

C. The conditions differ materially and substantially from conditions normally encountered and generally recognized as inherent in work of the character of the Project in the area of the Project Site; and

D. The Contractor has provided Notice of its claim as required by Section 17.05.

Time extensions necessitated by concealed conditions are governed by Section 3.07-D.

No claim for extra compensation or time for conditions described herein shall be allowed unless the Contractor has given the notice required by this Section and/or Section 3.08 hereof (regarding Notice of Delay). (See also: Section 4.04 regarding Site Conditions).

Section 16.07. EQUIPMENT AND METHODS.

Only equipment and methods suitable to produce the quality of Work required to conform to the Technical Specifications shall be permitted by the Contractor to operate on the Work. If any part of the Contractor's plan, equipment or methods of execution of the Work are determined by the Contract Administrator to be nonconforming to applicable safety regulations or to be non-conforming to applicable Technical Specifications, the Contract Administrator may order the Contractor to conform to the applicable requirements, and the Contractor shall promptly comply with such orders; provided, however, that neither compliance with such orders nor failure by the Contract Administrator to issue such orders shall relieve the Contractor from his obligation to perform the Work as required by the Contract Documents.

Section 16.08. TEMPORARY FACILITIES AND SERVICES.

The Contractor shall be responsible for providing and maintaining all necessary storage places, field offices, temporary roads, fences, and all utilities, including telephone, electric, gas and water service to the Site during construction at his sole cost and expense unless otherwise specified in the Technical specifications. The Contractor shall not connect to fire hydrants for construction water without the prior consent of the fire department with jurisdiction,

The Contractor shall comply with all requirements of Federal and State law and Yolo County Ordinances regarding the placement of temporary facilities on the Site, and the County shall not be deemed by this Agreement to have consented to such placement.

Section 16.09. COORDINATION OF WORK.

The Contractor shall be responsible for coordinating the work of the various subcontractors and trades employed on the Work. He shall adjust, correct, and coordinate this work with the work of others so that no discrepancies will result nor unnecessary delays occur.

If completion is delayed because of any acts or omissions of any subcontractors, the Contractor shall on that account have no claim against the County for extra compensation or time.

Section 16.10. JOINING WORK.

Where work of one trade or subcontractor joins or is installed upon the work of another trade or subcontractor, there shall be no discrepancy in mating or joining such work, which shall be done and finished in a good and workmanlike manner. In joining one kind of work with another, the marring or damaging of either shall be corrected at no expense to the County.

Should improper work of any trade be covered by that of another, it shall be the Contractor's responsibility to correct the improper work and to adjust costs between the various subcontractors, without cost to the County.

Section 16.11. CUTTING AND PATCHING OF WORK.

The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the work or to make its several parts fit together properly.

The Contractor shall not damage or endanger any portion of the Work or work being done by the County or any separate contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the County or any separate contractor except with the written consent of the Contract Administrator and of such separate contractor. The Contractor shall not unreasonably withhold from the County or any separate contractor his consent to cutting or otherwise altering the Work.

Section 16.12. INSPECTION OF THE WORK OF OTHER CONTRACTORS.

It shall be the duty of the Contractor and all subcontractors, before beginning any work, to examine all construction and work of other contractors and/or subcontractors that may affect their work, and to satisfy themselves that everything is in proper condition to receive such work.

Section 16.13. COMBINATION OF WORK WITH OTHER CONTRACTORS OR COUNTY.

If the Project requires performance of work by the County or other Prime Contractors, as specified in the supplementary Conditions, the following provisions shall apply:

A. The County reserves the right to perform work related to the Project with its own forces, and/or to award separate contracts in connection with other portions of the Project or other work on the Site.

B. When separate contracts are awarded for different portions of the Project or other Work on the Site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Agreement for Construction.

C. The County will provide for the coordination of the work of its own forces and of each separate contractor with the Work of the Contractor, who shall cooperate therewith as provided below.

D. The Contractor shall provide the County and separate contractors reasonable opportunity for the storage of their materials and equipment and the execution of their work on the site and shall connect and coordinate his Work with theirs as required by the Contract Documents. The Contract Administrator may designate separate areas on the Site for the use of separate contractors.

E. If any part of the Contractor's Work depends for proper execution or results upon the work of the County or any separate contractor, the Contractor shall, prior to proceeding with the Work, promptly report to the Contract Administrator any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor to report shall constitute an acceptance of the County's or separate contractor's work as fit and proper to receive his Work, except as to defects that may subsequently become apparent in such work by others.

F. Any costs caused by defective or ill-timed work shall be borne by the party responsible, therefore.

G. Should the Contractor unintentionally cause damage to the Work or property of the County, or to another contractor's work on the site, the Contractor shall, upon notice from the Contract Administrator, promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues or initiates a legal proceeding against the County on account of any damage alleged to have been caused by the Contractor, the County shall notify the Contractor who shall defend such proceedings, and if any judgment or award against the County arises therefrom, the Contractor shall pay or satisfy it and shall reimburse the County for all attorneys' fees and court or legal costs which the County has incurred.

H. If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up, the County may clean-up and charge the costs thereof to the contractors responsible therefore, as determined by the Contract Administrator.

Section 16.14. OVERTIME AND HOLIDAY WORK.

The Contractor shall secure the approval of the Contract Administrator before allowing work on the Project before 6:00 A.M. or after 6:00 P.M. on any working day, or any work on weekends or legal holidays.

The Contract Administrator may deny permission for such work, or impose conditions thereon, if needed to protect adjacent properties or land uses from noise, dust, or other work-related impacts not normally expected in the area during the terms proposed for such work. The Contract Administrator may consult with all governmental agencies with jurisdiction before responding to such requests.

The Contractor shall reimburse the County for all added costs to the County resulting from overtime and holiday work not specified by the Contract Documents, including Project Management and inspections by County employees and/or independent contractors, Project Architect cost increases, and any costs claimed

by any other contractor. Such reimbursement shall be made from the next progress payment due to Contractor.

Section 16.15. PROOF OF COMPLIANCE WITH CONTRACT DOCUMENTS AND LAW.

In order that the Contract Administrator may determine compliance with the requirements of the Contract Documents and applicable laws and regulations which are not readily ascertainable through inspection and tests of materials and work, the Contractor shall, at any time requested by the Contract Administrator, submit such documents or other satisfactory proofs as required by the Contract Administrator to demonstrate compliance by the Contractor with the Contract Documents and applicable laws and regulations.

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ARTICLE 17.

CHANGE ORDERS; WORK AUTHORIZATIONS; ALLOWANCES.

Section 17.01. NO CHANGES WITHOUT CONSENT; PERFORMING WORK ORDERED.

No extra work shall be performed, and no change shall be made, except pursuant to a written Change Order or Work Authorization from the County stating that the extra work or change is authorized, and no claim for any addition to the Contract Price or Time for completion shall be valid unless so ordered; provided, however, that nothing in this Article shall excuse the Contractor from diligently proceeding and fully completing the Project.

Section 17.02. CHANGE ORDERS AUTHORIZED; PROCEDURE.

A. **Change Orders Authorized**. Subject to legal requirements relating to competitive bidding, the County may require changes in, additions to, or deletions from the scope of the work to be performed or the materials to be furnished pursuant to the Contract Documents.

B. **Methods of Calculation**. Adjustments, if any, to the Contract Price by reason of any such change, addition or deletion, shall be determined by one or more of the following methods, at the County's sole discretion. The Contractor shall provide sufficient substantiating data to allow the County to evaluate the Contractor's claim for a Change Order.

1. By a lump sum proposal from the Contractor accepted by formal action by the County; and/or

2. By unit prices contained in the Contractor's original bid and incorporated in the Contract Documents or fixed by subsequent agreement between the County and the Contractor; and/or

3. By time and materials charges if approved by formal action of the County, limited to the "Actual Cost" to perform the Work, as defined by Paragraph "D" of this Section, plus overhead and profit as allowed by Paragraph "C" of this Section.

4. If the Change Order implements an Allowance procedure, the Contract Price adjustment shall be as specified in the Allowance.

C. **Overhead and Profit on Change Orders**. The maximum amount allowable on any change order for overhead and profit shall not exceed the following:

1. For change order work performed by the prime contractor, the maximum amount for overhead and profit shall be the following percentages of the "actual cost to perform the work" as defined in Paragraph D of this Section, plus a maximum of 1% of such costs for extra bond premiums, upon submission of a paid invoice for such premiums:

   a. If the change order is up to $1,000.99, 20%;

   b. If the change order is up to $1,001.00 and $4,000.99, 15%;

c. If the change order is between $4001.00 and $12,000.99, 12%;

d. If the change order is $12,001.00 or more, 10%.

2. For change order work performed by subcontractors, the maximum amount for all subcontractors' overhead and profit shall not exceed the percentages set forth in Subparagraph (1) above. The prime contractor may add 5% for the prime contractor's overhead and profit, and 1% for bond premiums if a paid invoice for extra bond premiums is submitted, both percentages being of the "actual cost" as defined in Paragraph B.

3. The allowances for overhead and profit as enumerated in the preceding subparagraphs shall include full compensation for any and all items of overhead including superintendence, layout, field engineering, and any related work, whether or not included within the definition of "actual cost" specified in Paragraph D.

D. **"Actual Costs" Defined**. The actual cost to perform the Work for purposes of this Section is limited to the applicable labor rates set forth in Article 12 hereof, including Contractor's contributions directly attributable to the Work authorized; and the material man's or supplier's invoice amount for all material and equipment actually used to accomplish the work authorized. All other direct and indirect costs, all costs attributable to the time needed to perform the work ordered by such Change Orders, and all profit associated with such work shall be included in the maximum overhead and profit amounts stated hereinabove.

E. **Audit and Verification**. All Change Order claims are subject to examination and audit before payment, if ordered by the Contract Administrator. If requested by the Contract Administrator, the Contractor shall furnish a detailed itemized breakdown and copies of all invoices for all costs being claimed for such Change Order, prior to the Contract Administrator's decision thereon. The Contract Administrator may order a more detailed audit of the Contractor's claim and supporting documentation if necessary to decide the claim.

F. **Deductive Change Orders**. If a Substitution, Field Order, Work Authorization, or Change Order is issued which reduces either the Scope of the Contract, the cost to perform the Work, the time to perform the work, or any combination thereof, the County shall be credited therefore on a Change Order. The credit shall be calculated in the same method as an extra-work Change Order. The Contractor shall submit time and materials data for approval by the Contract Administrator detailing the credit due the County. The County reserves the right to verify such data by reference to standard estimating manuals, the Contractor's Schedule of Values, or other documents, and to review the Contractor's estimate of the credit due.

G. **Periodic Change Orders**. The Contract Administrator is authorized to cumulate Work Authorizations and to process periodic Change Orders including additions and deletions, and to develop procedures providing the methods for such processing in addition to and consistent with those set forth in Division l.

Section 17.03. WORK AUTHORIZATIONS; PROCEDURE.

A. **Work Authorization Authorized**. The Contract Administrator or the County Administrative Officer, depending on amount, is authorized to issue Work Authorizations instructing the Contractor to proceed with extra work subject to the following maximum amounts, above which a Change Order must be approved by the Board of Supervisors.

B. **Maximum Amounts**. Work Authorizations may be issued by the Contract Administrator up to $2,000.99, and by the County Administrative Officer up to $25,000, maximum price adjustment authorized thereby. Either may approve a time allocation for such work, subject to the procedure and limitations specified in Section 3.07-D.

C. **Quotation by Contractor**. Other than in extraordinary circumstances as described below, before a Work Authorization is issued the Contractor shall submit a quotation setting forth an estimated cost of the extra work to be performed with sufficient substantiating data to allow the County to evaluate the quotation, and an estimate of the time necessary to perform the extra work. If requested by the Contract Administrator, the Contractor shall provide additional data to support the quotation. The Contractor shall acknowledge the quotation as binding.

D. **Claim for Price Adjustment**. After the extra work specified on the Work Authorization is completed, the Contractor may submit a claim for a Contract Price Change Order due to the Work Authorization. The claim shall be supported with substantiating data to show the actual costs to perform the Work and the overhead and profit being claimed, as defined in Section 17.02 C and D. The maximum price adjustment claimed shall not exceed one-hundred-ten (110%) percent of the approved quotation.

E. **Claim for Time Adjustment**. If the Contractor claims that the Work Authorization has delayed the Contract Completion Time, he shall verify the claimed delay by demonstrating with reference to the approved Project Progress Schedule that the Work Authorization in fact caused a delay in the overall completion date of the Project. Upon such demonstration, the Contract Administrator shall process a request for a Contract Time extension Change Order pursuant to Article 3 hereof.

F. **Accumulation of Work Authorizations**. At the Contract Administrator's sole discretion, the Contractor's claims for change Orders arising from several Work Authorizations may be accumulated into periodic Change Orders adjusting Contract Price, Time, or both, separately or in one Change Order.

Such periodic Change Orders shall include deductions for Changes that constitute Deductive Change Orders, as defined in Section 17.02-F during the time period being considered in the periodic Change Order.

G. **Immediate Work Authorizations**. In the event extraordinary circumstances arise which require extra work to be authorized before a quotation is prepared by the Contractor, the Contract Administrator or County Administrative Officer may issue an immediate Work Authorization without such quotation. Such Work Authorization shall include a maximum authorized sum over which no price adjustment will be authorized. The determination as to whether circumstances as

described above exist is discretionary with the County. Such Work Authorizations otherwise shall be processed as specified in this Section.

Section 17.04. EXTRA WORK CLAIMS; PROCEDURE.

If the Contractor claims that any Clarification or other instruction issued by the County requires work beyond the scope of the Agreement for Construction, the following provisions shall apply:

A. **Notice to Contract Administrator**. The Contractor shall notify the Contract Administrator of its claim, and submit a quotation for the claimed costs, in the same manner as specified in Section 17.03-C. The Contractor shall submit additional information requested by the Contract Administrator to decide the claim.

B. **Action by Contract Administrator**. The Contract Administrator shall review the Contractor's submittals and either approve or deny the Contractor's claim. The Contract Administrator shall issue his decision within twenty-one (21) days of receipt of a complete submittal from the Contractor. If the claim is approved, the Contract Administrator may process either a Change Order or Work Authorization, pursuant to this Article. If the claim is denied, the Contract Administrator shall so advise the Contractor. Thereafter, the Contractor shall proceed with the work in issue.

C. **Time**. If the claim is approved, the time during which the claim was being considered shall be included in the time allocation for the Work Authorization adjusting the claim, and Section 17.02 shall apply thereto; if the claim is adjusted by Change Order, any Time extension authorized thereby shall include the time during which the claim was pending. If the claim is denied, no time adjustment shall be authorized.

D. **Effect of Proceeding**. If the Contractor proceeds with the work without notifying the Contract Administrator pursuant to Paragraph A, or before a decision pursuant to Paragraph B, any claim for a Contract price and/or time adjustment shall be waived.

E. **Scheduling**. The Contractor is responsible to schedule the work and submit extra-work claims so the time required for decision, as specified in Paragraph B, does not delay the Work in general.

Section 17.05. ALLOWANCES; PROCEDURE.

The Contractor's bid includes the amounts specified for Allowances in the Contract Documents. Work or materials specified as included in the Allowance shall be provided by the Contractor for the Allowance amount.

The County reserves the right to specify work and/or materials which differ from those specified as included in the Allowance, in which case additive or deductive changes to the Contract Price shall be processed pursuant to this Section.

Unless otherwise expressly specified in the Contract Documents, the following provisions shall control the Price adjustment for the Allowance:

A. The Contract Price bid by the Contractor shall include the cost for the Allowance item(s), delivered to the Site, unloading, handling, storage, taxes, and all overhead and profit pertaining thereto. If the

Allowance is specified as including labor, the Contract Price bid by the Contractor shall include all costs of such labor, including superintendence, overhead and profit.

B. If the County orders item (s) or labor different from those specified as included in the Allowance, the Contract Price shall be adjusted by either a deductive or additive Change Order pursuant to Section 17.02, or a Work Authorization pursuant to Section 17.03.

C. Unless another method is specified by the Allowance, the price adjustment shall be based upon the following:

1. The actual costs of the items ordered by the County, delivered to the Site and made ready for incorporation in the Project shall be compared to the material cost specified in the Allowance. "Actual costs" is defined by Section 17.02-D.

2. The actual costs of labor to incorporate the items ordered by the County in the Project shall be compared to the labor amounts specified in the allowance, if any. "Actual Costs" is defined by Section 17.02-D.

3. The results of the materials and labor adjustments shall then be compared. If the net adjustment resulting from this comparison is additive, the Contractor shall be entitled to overhead and profit as specified by Section 17.02-D only on the net amount resulting from the previous calculations. Such overhead and profit shall include all sums authorized for all indirect costs associated with the Allowance, including materials, shipping, handling, unloading and storage and labor superintendence. If the net adjustment is negative, nothing shall be deducted for overhead and/or profit.

4. The resulting adjustment shall either be reflected in a separate Change Order or cumulated in a periodic Change Order, at the Contract Administrator's sole discretion.

5. Any Contract Time adjustment claimed by the Contractor shall be subject to Section 3.07.

Section 17.06. MINOR CHANGE ORDERS BY COUNTY ADMINISTRATIVE OFFICER.

The Yolo County Board of Supervisors has authorized the County Administrative Officer to order changes or additions in the work being performed under construction contracts, pursuant to Public Contracts Code Section 20142,

This authorization allows any change or addition in the Work to be ordered in writing by the County Administrative Officer when the extra cost to the County does not exceed the sum of TWENTY-FIVE-THOUSAND DOLLARS ($25,000) plus 5% of the amount of the contract in excess of $250,000.00, up to 10% of the Contract Price, whichever is less.

Section 17.07. CHANGE ORDERS REGARDING TIME FOR COMPLETION.

Any time extension authorized by the County pursuant to Article 3 hereof shall be set forth in a Change Order issued by the County Administrator.

Section 17.08. CHANGE ORDERS DUE TO UNAVAILABLE MATERIALS.

In the event that the Contractor demonstrates good cause for a delay in the Contract Time due to the unavailability of materials, the County, in its sole discretion, may either grant a Contract Time extension change order pursuant to Section 3.07-A hereof, or utilize this Section.

In the event that the Project is unable to be completed due to unavailable materials, and if the Project is complete otherwise, the Contractor may request to delete the portion of the Project not yet completed from the Agreement for Construction, thereby allowing a Notice of Completion to be filed on the remainder of the Project. The County shall approve no such Change Order unless the Contractor accompanies his request with an offer to perform the work so deleted for a price not to exceed the value of the work deleted by such Change Order, such work to be commenced upon delivery of the materials, and diligently prosecuted to completion. In the event the County elects to accept the Contractor's offer, work done pursuant thereto shall not be construed as work done on the Project, nor shall such work be construed as affecting, in any way, the legal significance of the Notice of Completion filed on the Project.

The application of this Section is limited as follows:

A. No Change Order shall be issued pursuant to this Section until the Contractor has submitted all documents required for final payment.

B. This Section shall apply only to work the Completion of which is precluded due to unavailable materials.

C. Utilization of this Section lies solely within the discretion of the County, and such discretion hereby is delegated to the Contract Administrator.

Section 17.09. EFFECT OF CONTRACTOR'S ACCEPTANCE OF CHANGE ORDER.

By acceptance of a Change Order, Contractor agrees to the changes, if any, in the Contract Price specified for each item and to the specified extension of Time allowed, if any, for completion of the entire work on account of such Change Order, and agrees to furnish all labor and materials and perform all work necessary to complete all additional work specified therein for the price adjustment and within the time specified therein. Contractor shall make no additional claim for adjustment to the Contract Price or Time, nor for additional costs or damages, on account of the Work referenced in such Change Order. A Change Order duly issued by the County and accepted by the Contractor shall constitute a complete accord and satisfaction as to the Work, Contract Price and Contract Time changed thereby. Contractor shall defend and indemnify the County, as required by section 2.05, if any subcontractor asserts any claim against the County due to a duly issued and accepted Change Order.

Section 17.10. EFFECT ON SURETIES.

All changes authorized by the Contract Documents may be made without notice to or consent of the sureties on the performance and payment bonds and shall not reduce their liability on the bonds.

The County reserves the right to require additional performance and payment bonds to secure a Change Order. In this event, the Change Order shall be increased by the actual cost of the bond premium for the additional bond amounts, if any, up for a maximum of 1%.

ARTICLE 18.

INSPECTION.

Section 18.01. ACCESS FOR INSPECTION.

The Contract Administrator, the Project Architect, the County Inspector(s), and other designated employees or agents of the County, and inspectors of all agencies of jurisdiction over the Project or funds used for the Project shall at all times have access for the purpose of observation to all parts of the Work and to all shops wherein the Work is in preparation. The Contractor shall cooperate and furnish such facilities and assistance as needed for the Inspector(s).

Sections 18.02. NOTICE OF READINESS FOR INSPECTION.

Where the Contract Documents, instructions by the Contract Administrator, laws, ordinances, or any public authority having jurisdiction requires work to be inspected, tested or approved before any portion of the Work proceeds, such work shall not proceed, nor shall it be covered up without inspection.

The Contractor shall give notice to the Contract Administrator at least two (2) days in advance of the readiness for any Contract compliance inspection by the County Inspector. The Contractor shall give notice as required by all other inspection agencies of jurisdiction for Code and regulation compliance inspection. In all cases, the Contractor shall schedule inspection so as not to delay the Work.

Section 18.03. CONTRACT COMPLIANCE INSPECTIONS.

All work done and all materials furnished shall be subject to the inspection and approval of the Contract Administrator for compliance with the Contract Documents, either acting personally or through the County Inspector(s).

Any work covered without required inspection, or not in compliance with the Contract Documents or instructions to the Contract Administrator, shall, upon the instruction of the Contract Administrator, be uncovered for inspection and properly restored after inspection and approval, at no cost to the County.

Section 18.04. INSPECTION OF COMPLETED WORK.

Should the Contract Administrator determine that it is necessary or advisable to make an inspection of Work already completed and inspected at any time before final inspection and acceptance of the Project, by removing or exposing the Work, Contractor shall, upon instruction of the Contract Administrator, promptly furnish all necessary facilities, labor and materials to do so. If such work is found to be defective in any aspect, the Contractor shall bear all expenses of such examination and satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract Documents, the additional cost of labor and materials necessarily involved in the examination and replacement shall be allowed the Contractor, and a Change Order shall be issued.

This Section shall not apply in the case of Work covered without required inspection, which is governed by Sections 18.02 and 18.03.

Section 18.05. AUTHORITY OF COUNTY; STOP WORK NOTICES.

The Contract Administrator and the County Inspector shall have the authority to order the Work stopped if either determines that the Work is proceeding in violation of the Contract Documents or any orders issued by the Contract Administrator. Such order shall be effective only upon the posting of a stop work notice upon the Work or portions of the Work in question.

Upon issuing a stop work notice, the County Inspector shall immediately notify the Contract Administrator, who shall inspect the Work in question and determine whether it does or does not comply with Contract Documents. The decision of the Contract Administrator shall be final. The Contractor shall thereafter comply with the instructions of the Contract Administrator regarding corrections needed to cure the defect. The stopped Work shall be resumed only when such instructions are fulfilled, and a resume work notice is issued by the Contract Administrator. The Contractor shall not be entitled to an extension in time in the event of such suspension of Work, except as authorized in Section 3.14 hereof.

Section 18.06. EFFECTS OF INSPECTIONS.

Neither the final inspection and payment, nor any interim inspection or progress payment shall relieve the Contractor of any obligation to fully perform the Agreement for Construction as required by the Contract Documents and all applicable laws and regulations.

Any work, materials, or equipment not meeting the requirements and intent of the Contract Documents and all applicable laws and regulations may be rejected, and suitable work or materials shall be made good, notwithstanding the fact that such work or materials may previously have been inspected and/or payment therefore may have been made.

Section 18.07. AUTHORITY OF CONTRACT ADMINISTRATOR.

The Contract Administrator shall decide all questions which may arise as to the quality or acceptability of materials and/or equipment furnished or work performed, and as to the interpretation of Contract Documents and Specifications; all questions as to the acceptable performance of the Contract; and all questions as to compensation.

Section 18.08. AUTHORITY OF COUNTY INSPECTOR(S).

The designated County Inspector is a representative of the Contract Administrator for purposes of inspection of the work for compliance with the Contract Documents and monitoring the Contractor's performance. He is authorized to order a cessation of non-complying Work pursuant to Section 18.05, and to certify the field copies of the Contractor's requests for progress payments. He conducts meetings as required by the Technical Specifications and generally monitors the contractor's performance for the Contract Administrator.

If a person or firm other than the Construction Manager is engaged as County Inspector, the Inspector is not authorized to bind the County in discussions with the Contractor, nor to issue Clarifications, Field Orders, Work Authorizations, or Change Orders.

No interpretations of the Contract Documents made by the Inspector are binding on the County unless the Contract Administrator adopts such interpretation by a written clarification.

The Contractor shall not attempt to influence the Inspector in the performance of his duties, nor request him to exceed his authority. The County shall honor no request by the Contractor that is based on any action of the Inspector beyond the scope of the Inspector's authority as specified in this Section.

Section 18.09. BUILDING INSPECTIONS AND CODES.

The Contractor shall provide access to inspectors from all agencies having jurisdiction over the Project.

Such inspectors are independent of the Contract Administrator and the County Inspector(s), and approval by either shall not constitute approval by the other.

The Contractor shall obey all orders of the inspectors with jurisdiction, and if such inspector reports a violation of any Code within his jurisdiction, the Contractor immediately shall notify the Contract Administrator.

The Contractor is responsible to comply with all applicable Codes in the construction of the Work.

ARTICLE 19.

PUBLIC UTILITIES.

Section 19.01. UTILITIES USED DURING CONSTRUCTION.

Unless otherwise specified in the Contract Documents, the Contractor shall provide and pay for all necessary water, gas, and electricity required for himself, and all trades employed in the performance of the Agreement for Construction.

The Contractor shall send all required notices, make all necessary arrangements, and perform all other services required in the care and maintenance of such utilities, and assume all financial responsibility concerning the care and maintenance of said utilities.

All temporary connections to such utilities shall be maintained in such manner as not to interfere with the continuing use of such utilities by the County during the entire progress of the Work.

The enclosing of such public utility equipment shall be done by the Contractor consistent with the requirements of the utility. Upon completion of the Work, the Contractor shall remove all enclosures and fill-in and leave in a finished condition all openings for such utilities.

Section 19.02. LIGHTING.

Contractor shall furnish, wire for, install and maintain temporary electric light whenever it is necessary to provide illumination for the proper performance and inspection of the Work, unless otherwise specified. The lighting shall provide sufficient illumination and shall be so placed and distributed that the Contract Documents can be easily read in every place where the Work is being performed. This temporary lighting equipment may be moved about, but shall be maintained throughout the Work and available for the use of the Contract Administrator or County Inspector(s) whenever required for inspection.

Section 19.03. PERMANENT UTILITIES; INSTALLATION.

The Contractor shall install all permanent utilities called for by the Construction Documents strictly in compliance with all laws, regulations and requirements of the particular utility company or governmental agency providing the utility.

Section 19.04. TOILET FACILITIES FOR WORKERS.

The Contractor shall provide and maintain for the duration of the Work temporary toilet facilitates as required by the Yolo County Health Department, which shall be weather-tight structures with raised floors.

The Contractor shall service such facilities daily and shall pump such facilities as required, to maintain them in a clean and sanitary condition.

Section 19.05. DISRUPTION OF UTILITY SERVICE.

The Contractor shall secure the advance approval of the Contract Administrator regarding scheduling of any disruption of utility service to other structures necessitated by the Work.

The Contractor is advised that unscheduled disruptions of electrical service to County buildings may seriously damage computer and word-processing equipment and/or software, and other equipment and/or material in use in such building, and the Contractor will be liable for all resulting repair and re-programming costs if occasioned by an unscheduled disruption caused by Contractor.

Section 19.06. UTILITIES FOR COUNTY PERSONNEL.

If the Contract Documents call for the Contractor to provide temporary on-site office trailers for County personnel involved in the Project, the Contractor shall provide utility services for such trailers pursuant to this Article.

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ARTICLE 20.

PERMITS, LICENSES, ORDINANCES AND REGULATIONS.

Section 20.01. COMPLIANCE WITH CONSTRUCTION REGULATIONS.

The Contractor shall conduct the Work so that all laws, regulations, and ordinances for the protection of the public and the workers shall be obeyed fully both by the Contractor and by all subcontractors on the site.

The Contractor shall obtain and keep current all licenses or permits required by the State Contractor's Licensing Act and/or other licenses required to authorize him to perform the Work and shall require all subcontractors to comply with this section.

Section 20.02. PERMITS; FEES.

Unless otherwise specified by the Contract Documents or ordered by the Contract Administrator, the Contractor shall obtain all permits, licenses and/or entitlements that are required for the performance of the Work by all laws, ordinances, rules, and regulations or orders of any officer and/or body with jurisdiction, shall give all notices necessary in connection therewith, and shall pay all fees required relating thereto and all costs or expenses incurred on account thereof.

Section 20.03. COMPLIANCE WITH LAWS AND REGULATIONS.

The Contractor shall keep himself fully informed of and shall observe and comply with, and shall cause all subcontractors and all employees to observe and comply with all Federal and State laws, and County or Municipal Ordinances, regulations, orders or decrees which in any manner affect those engaged or employed on the Work, or the materials used in the Work, or in any way affect the conduct of the Work. The Contractor shall ensure that the Work is constructed and completed in compliance with all applicable laws and regulations.

Section 20.04. VIOLATION OF LAWS AND REGULATIONS; INDEMNITY.

The Contractor shall save harmless, defend, and indemnify the County and all of its officers, agents, and employees against any liability or claim arising from or based upon the violation of any law, ordinance, regulation, order or decree, whether by himself, his agents, employees, or his subcontractors or their agents or employees.

Section 20.05. SPECIFIC STATE LAWS AND REGULATIONS.

In addition to the general requirements set forth above, the Contractor's attention is directed to and Contractor shall be responsible for performing and completing the Work in compliance with all laws of the State of California governing the construction of buildings in general as well as those governing construction of public buildings, including, without limitation, the following:

A. The California Health & Safety Code and all applicable Administrative Code regulations adopted pursuant thereto.

B. All laws governing the employment of labor, qualifications for employment of aliens, payment of employees, convict-made materials, domestic and foreign materials, and accident prevention.

C. Title XIX of the California Administrative Code entitled, "Public Safety", Chapter 1, State Fire Marshal, Sub-chapter 12, General Fire and Panic Safety".

D. General Industrial Safety Orders, including but not limited to the provisions of Title VIII of the California Administrative Code relating to safe and proper use, construction, disposal, etc. or materials, machinery, and building appurtenances as therein set forth.

E. All rules and regulations of the State Fire Marshall; the safety orders of the Division of Industrial Safety; and Department of Industrial Relations regulations.

All of the above laws and regulations are expressly incorporated in the Agreement for Construction and are as much a part of the Contract Documents as if they were incorporated in their entirety in these General Conditions.

The Contractor shall not interpret the enumeration set forth above as being a complete listing of all applicable laws. It is also the Contractor's responsibility to inform himself regarding the requirements of all applicable laws regarding the performance of construction contracts for California counties and to obey them, and the Contractor agrees by execution of the Agreement for Construction to do so at his sole cost, expense and risk. (See also Section 14.07 regarding Cal OSHA and Section 20.08 regarding hazardous materials).

Section 20.06. COMPLIANCE WITH CONDITIONS OF PERMITS.

The Contractor shall conduct the Work in conformity with the conditions imposed on all permits or other entitlements which address the performance of the Work by the Contractor, whether or not such permits or entitlements are incorporated in the contract Documents.

Such permits may include, but are not limited to, measures required during the construction of the Work and incorporated in the Project to avoid or mitigate the environmental effects of the Project, pursuant to the California Environmental Quality Act, and conditions imposed on use permits issued by any agency with jurisdiction.

It shall be the Contractor's responsibility at all stages, from bidding through final completion, to inform himself of the requirements of any such permits. Copies are available from the Contract Administrator.

The Contractor's attention is directed to the Supplementary Conditions and Technical Specifications setting forth additional requirements, if any, regarding this subject.

Section 20.07. COMPLIANCE WITH CONDITIONS OF GRANTS.

The Contractor shall conform to all requirements of Federal and/or State authorities that have provided grant funding for the Project. Specific requirements are specified in the Supplementary Conditions and Contract Documents. Without limitation thereof, Contractor shall keep financial, wage and hours, equal employment opportunity and other records required by any such grant and shall allow access to the Site by inspectors from such agencies.

The Contractor shall cooperate fully with and assist the County in its efforts to comply with all conditions imposed on such grant funding.

Section 20.08. HARMONIZATION WITH CONTRACT DOCUMENTS.

The Contract Documents are intended to be coordinated to described and provide for the complete Project in a manner that complies with all applicable laws and regulations.

In the event of a conflict between the Contract Documents and the applicable laws and regulations, the applicable laws and regulations shall govern; provided, however, that in the event of conflict involving quantity or quality, the greater quantity and the higher quality shall be furnished. All other conflicts shall be handled in the manner described in Section 4.02 of these General Conditions.

Section 20.09. COMPLIANCE WITH HAZARDOUS MATERIALS REPORTING AND USE REQUIREMENTS; CLEAN-UP; INDEMNITY; WITHHOLD.

A. **Reporting and Use**: The Contractor shall file all reports required by Federal and/or State agencies regarding the presence on the Site and/or use of toxic or any hazardous material and shall store and/or use such materials in strict conformity with all applicable laws and regulations.

B. **Clean-Up**: The Contractor shall clean-up any toxic or hazardous spill or pollution caused by the Contractor and/or any subcontractor, material man or carrier occurring on the Site, and shall remove all polluted water, dirt or materials to an approved disposal site, as required by the Federal and/or State agencies with jurisdiction or, if none, by the County Health Department, all without cost to the County.

C. **Indemnity**: The Contractor shall save harmless, indemnify and reimburse the County for all costs for defense of any County liability, cost, claim or damages resulting from the Contractor's failure to perform Paragraphs "A" and/or "B" of this Section, and/or a toxic or hazardous spill within Paragraph "B" of this Section.

D. **Withhold**: In addition to all withholds or retentions authorized by the Agreement for Construction, the County shall retain sums sufficient to offset the County's costs resulting from Contractor's failure, refusal or neglect to conform to all requirements of this Section.

ARTICLE 21.

PRESERVATION AND CLEANING.

Section 21.01. PROTECTION OF WORK.

The Contractor shall protect and preserve the Work from all damage or accident, and shall at its cost provide any temporary roofs, window and door coverings, enclosures, boxing, or other construction as required for this purpose.

Section 21.02. PERIODIC CLEANING OF PROJECT.

The Contractor shall properly clean the Site and the Work as it progresses, and from time to time shall remove all dirt, debris, waste, rubbish, and implements of service from the Project and the Site. Debris, waste, or unused construction materials shall not be left under, in, or about the Project, nor allowed to accumulate in the Project or the Site. The Technical Specifications specify additional requirements regarding this subject.

The Contractor, at its sole cost, shall contract with a disposal company to remove all such rubbish, and shall have the containers therefore emptied at frequent enough intervals so that waste does not overflow the containers.

Section 21.03. FINAL CLEANING OF PROJECT.

Prior to the request for Final Inspection, the Contractor shall thoroughly clean the interior and exterior of the Work, and do all things required by the Technical Specifications regarding final cleaning.

Final cleaning shall not be accepted unless the Project is in all respects ready to occupy without further cleaning by County forces.

ARTICLE 22.

OCCUPANCY BY COUNTY.

Section 22.01. USE OF COMPLETED WORK.

Whenever, in the opinion of the County, the Work or any part thereof is in a condition suitable for use, and the best interests of the County require such use, the County may take possession of, connect to, and open for public or County use, the Work or any part thereof, subject to this Article.

Section 22.02. REPAIRS OR RENEWALS IN THE WORK.

Prior to the date of final acceptance of the Work by the County, all necessary repairs or renewals of the portion of the Work occupied pursuant to Section 22.01 hereinabove (or part thereof) shall be made at the Contractor's expense if necessary due to defective material and/or workmanship, or to the operations of the Contractor, ordinary wear and tear excepted.

Section 22.03. EFFECT OF OCCUPANCY.

The occupancy by the County of the Work or any part thereof as authorized by this Article shall in no case be construed as constituting acceptance by the County of the Work or any part thereof. Such use shall neither relieve the Contractor of any of his responsibilities under the Contract Documents, nor act as a waiver by the County of any of the terms or conditions of the Agreement for Construction. Notwithstanding occupancy by the County pursuant to this Article, the warranty periods on all products and the Contractor's basic warranty pursuant to Article 26 shall not commence, and the term thereof shall not be diminished, as a result of County occupancy. The warranty periods commence only upon recordation of a Notice of Cessation of Work or a Notice of Completion.

Section 22.04. COORDINATION WITH OTHER ACTIVITIES.

In the event that the Project, or any portion of the Site, is occupied by the County during the Work, it shall be the responsibility of the Contractor to conduct his operations so as not to unreasonably interfere with the use of the occupied portions by the County.

The Contractor shall submit periodic schedules to the Contract Administrator proposing the times, areas, and types of work to be done within such areas. The Contract Administrator shall approve, conditionally approve, or reject such schedule, and the Contractor shall comply with the Contract Administrator's instruction.

In the event that the Work produces conditions rendering uninhabitable the portions of the Project, the Site, or other areas occupied by the County, either because of noise, dust, vibration, smoke, fumes, or for any other cause, the Contract Administrator may order the Work ceased, or modifications to the schedule, and the Contractor shall comply at it's sole cost and expense.

Section 22.05. PRICE OR TIME ADJUSTMENTS.

In the event the County exercises its right to take early occupancy pursuant to this Article, and provided that the Contract Documents at the time of bidding did not specifically indicate the County's

intention to do so, the Contractor may request an adjustment to the Contract Price and/or Time, for extra costs and/or time directly caused by the early occupancy. Article 17 shall apply to any request by the Contractor for a Contract Price adjustment, and Article 3 to a Contract Time adjustment, resulting from the County's occupancy pursuant to this Article.

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ARTICLE 23.

PROGRESS PAYMENTS.

Section 23.01. SUBMISSION OF CLAIMS.

On or before the seventh (7th) day of each month, the Contractor shall prepare and forward to the Contract Administrator a statement in writing, on forms provided by the County, detailing the following work done during the preceding month:

A. The units or work completed during the preceding month, with reference to the Progress and Value Schedules approved pursuant to Article 3, or approved modifications thereto, and the date of inspection and approval thereof.

B. The portion of the progress claim attributable to such units of work.

C. All acceptable materials furnished and delivered to and stored on the Site or other approved location for use in the performance of the Work, but not yet incorporated in the Work.

D. The value of such materials, with reference to the Schedules of Value provided pursuant to Article 3 hereof.

E. The date of inspection and approval by the County of any such materials and labor.

If the Contract Documents require the sampling and testing of any such materials or labor, the claim shall indicate whether such sampling and testing has been approved and, if so, the date thereof.

As part of such claim for payment, the Contractor shall agree that, upon payment of such claim (or part thereof), the Contractor will indemnify, defend and hold harmless the County, its officers, agents and employees from and against any and all claims for damages, costs, compensation or any other recovery, including but not limited to claims of the Contractor, subcontractors, suppliers, laborers and workers, based upon the portion of the Work for which payment is claimed (or such part thereof for which payment is made). As part of such claim for payment, Contractor shall also provide proof that all subcontractors, suppliers, etc. have been paid and have provided releases for all portions of the Work for which the Contractor has previously been paid. Such claims shall be executed by the Contractor under penalty of perjury.

Each payment request shall be reviewed by the Contract Administrator as soon as practical after receipt for the purpose of determining that the payment request is a proper payment request. Any payment request determined not to be a proper payment request suitable for payment shall be returned to the contractor as soon as practicable, but not later than seven days, after receipt. A request returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.

Within seven (7) days of receipt of a fully completed claim form, the Contract Administrator shall verify such claim and shall take such steps as are necessary to investigate the accuracy of any statements made by the Contractor. Contractor shall provide such other and further documentation as ordered by the

Contract Administrator to enable verification of a claim for a progress payment and the time until such additional documentation is delivered shall extend the time for processing the claim.

The Contract Administrator shall verify the claims for progress payments by use of the Progress and Value schedules approved pursuant to Article 3 hereinabove, or subsequently approved modifications thereto.

Section 23.02. PAYMENT; WITHHOLDS.

Upon approval of a claim for progress payment by the Contract Administrator, such claim shall be paid; provided, however, that the following amounts shall be withheld as security:

A. No greater than Ten (10%) percent of the value of the Work done.

B. Ten (10%) percent of the value of the acceptable materials delivered to and accepted by the County, but not yet incorporated in the Work.

Within the time specified in the Contract Documents, the County shall pay to the Contractor, while the Contractor is carrying on the Work, the balance of any progress payment not withheld as set forth above, after deducting therefrom all previous payments and all sums to be retained under the provisions of law or of the Contract Documents.

No payment by the County shall be construed to be an approval by the County of any defective work or improper materials, nor as an acceptance as completed of any portion of the Work.

If the County fails to make any progress payment within 30 days after receipt of an undisputed and properly submitted payment request, the County shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

Section 23.03. POSTING SECURITIES IN LIEU OF WITHHOLDS.

Pursuant to Public Contract Code Section 22300, at the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the County, or with a state or federally chartered bank as the escrow agent, who shall pay such monies to the Contractor upon satisfactory completion of the Contract.

Securities eligible for investment under this section shall include those listed in Government Code 16430 or bank or savings and loan certificates of deposit.

The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest hereon.

The escrow agent shall be a trustee of the County.

Section 23.04. RETAINING ADDITIONAL AMOUNTS; GROUNDS.

In addition to the amounts which the County withholds as provided in Section 23.02, the County shall retain a sufficient amount of any payment otherwise due to the Contractor as in the sole discretion of the Contract Administrator may be necessary to protect the County in the event of the following:

A. The receipt of Stop Notices and Claims against the Contractor or any subcontractor for labor or materials furnished on the Project;

B. For the cost to correct defective work not remedied, including failure to periodically clean the Site and Work as specified in Section 21.02.

C. For failure of the Contractor to make progress payments to any of its subcontractors;

D. For the occurrence of reasonable doubt that the Project can be completed for the balance of the Contract Price, as reflected in the approved Schedule of Values, or within the Contract Time, as shown on the approved Progress Schedule;

E. For the refusal of the Contractor to commit sufficient resources so that the Work proceeds in accordance with the approved Progress Schedule. Section 3.11 regarding Liquidated Damages shall apply in such event;

F. For failure of the Contractor to comply with any lawful or proper direction concerning the work given by any County representative authorized to have given such instruction;

G. For claims and/or penalties which State or Federal law assesses against the Contractor for violation of such law, including prevailing wage claims;

H. For any claim or penalty asserted against the County by virtue of the Contractor's failure to comply with the provisions of all governing laws, ordinances, regulations, rules and orders;

I. For any reason specified elsewhere in the Contract Documents as grounds for retention.

In order to adequately to protect the County, the basic standard to determine the amount of retention pursuant to this section shall be ONE-HUNDRED-TWENTY-FIVE (125%) PERCENT of the amounts claimed or the value of the Work not done or defectively done, plus interest and litigation costs; provided, however, that County retains the authority to retain greater sums should such sums be necessary in the County's discretion adequately to protect it.

In the event the progress of the Work does not meet the approved Progress Schedule, the County may retain the amounts specified in Section 3.11 and Section 2 of the Agreement for Construction for each day the Work is behind schedule.

The County retains the right to make, or not to make, any partial progress payment involving sums not in dispute, or to retain the total progress payment pending resolution of any such dispute.

Section 23.05. DISBURSEMENT OF RETAINED AMOUNTS.

The County, in its sole discretion, may apply any such retained amount or amounts to the payment of any such claims resulting in a retention. Any payment, so made by the County, shall be considered as a payment made under this Contract by the County to the Contractor. The County shall not be liable to the Contractor for any such payments made in good faith. Such payments may be made without a prior judicial determination of the claim or claims. The County shall render to the Contractor a proper accounting of any such funds dispersed on behalf of the Contractor. The County reserves the right to utilize warrants issued to the Contractor and Claimant as joint payees for this purpose.

Prior to applying such amounts as stated hereinabove, County shall afford the Contractor an opportunity to present good cause, if any he has, why the claim or claims in issue are not valid or just claims against the Contractor. The County then reserves the right to take such further steps as are appropriate, in its sole discretion, including, but not limited to, seeking a judicial resolution of the controversy.

Section 23.06. CORRECTION OF STATEMENT AND WITHHOLDING OF PAYMENT.

No inaccuracy or error in any claim provided by the Contractor shall operate to release the Contractor or any surety from the error, or from damages arising from such error, or from any obligation imposed by the Contract Documents. The County shall retain the right subsequently to correct any error made in any previously approved claim for the progress payment, or progress payment issued, by later adjustments to subsequent progress payments.

Section 23.07. EFFECT OF PROGRESS PAYMENTS.

Neither the payment, the withholding, nor the retention of all or any portion of any progress payment claimed to be due and owing to the contractor shall operate in any way to relieve the Contractor from his obligations under the Agreement for Construction. The Contractor shall continue diligently to prosecute the Work without reference to the payment, withhold or retention, of any progress payment. The payment withhold or retention of any progress payment shall not be grounds for an adjustment to the Contract Time or Contract Price. By making progress payments, the County waives no right nor releases any obligation of the Contractor to the County.

ARTICLE 24.

FINAL INSPECTION.

Section 24.01. NOTICE OF FINAL INSPECTION.

When the Work is completed, the Contractor shall request a final inspection. Within ten (10) days of the receipt of such request, the Contract Administrator shall make a final inspection. The Contractor or his representatives may be present at the final inspection. The purpose of such final inspection shall be to determine whether the Work has been fully completed in accordance with the Contract Documents, including all modifications previously issued.

Section 24.02. PUNCH LIST.

The Contract Administrator shall notify the Contractor in writing of any deficiencies to be remedied prior to final acceptance, by preparing a written list of deficiencies, known in the industry as a "punch list".

The Contractor shall remedy all items shown on the punch list prior to final acceptance by the Contract Administrator.

The Contract Administrator is not authorized to amend the Contract by use of the punch list; it is provided solely for the benefit of the Contractor to enable him to determine whether items must be corrected before final acceptance will be recommended by the Contract Administrator. The County reserves the right to require compliance with the Contract Documents, notwithstanding the issuance of a punch list or the completion by the Contractor of all items on the punch list.

In the event that the Work still does not comply with the Contract Documents, the County reserves the right to issue such further punch lists as may be required, or to deduct from the final payment the cost of correction of any Work not completed in accordance with the Contract Documents without the issuance of further punch lists.

Section 24.03. ADDITIONAL SUBMITTALS.

After completion of work on punch list items, and before the Contractor's Request for Final Payment, the Contractor shall submit the following items:

A. A complete and accurate accounting, showing the total amounts claimed by the Contractor, all subcontractors and all suppliers due for final payment of the Project. The accounting shall identify first-tier subcontractors (those with a contract directly with the contractor) separately from all other claimants and shall include all subcontractors listed by the Contractor pursuant to Article 11. This accounting shall be submitted under penalty of perjury.

B. A complete and accurate set of Record (as-built) Drawings prepared by the Contractor pursuant to Section 4.05 and the Technical Specifications.

C. The Contractor's guarantee required by Article 26 hereof, and all other guarantees and warranties required by the Contract Documents.

D. The Contract bond securing the Contractor's guarantee pursuant to Article 26 hereof.

E. Proof acceptable to County of proper release from all claims regarding patents and/or copyrights pursuant to Section 6.09 hereof.

F. All operating manuals required by the Technical Specifications for all mechanical and electrical installations.

G. All other submittals required by the Contract Documents prior to final payment.

Section 24.04. SYSTEMS DEMONSTRATION.

Before submitting a Request for Final Payment, Contractor shall demonstrate the operation of all systems in the Work to such persons as directed by the Contract Administrator, and shall instruct County personnel in the operation, adjustment, and maintenance of all equipment and systems.

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ARTICLE 25.

ACCEPTANCE AND FINAL PAYMENT; ADMINISTRATION OF THE WITHHOLD ACCOUNT.

Section 25.01. CONTRACTOR'S REQUEST FOR FINAL PAYMENTS AND CHANGE ORDERS.

When the Work is fully (100%) complete and all items on the punch list have been satisfied, or the Contractor contends that such items are not required by the Contract Documents, the Contractor shall submit Requests for Final Progress Payment and Final Payment.

The request for Final Progress Payment shall include the total amount the Contractor contends is due on the Contract Price less the amounts to be withheld for Final Payment. The amounts to be withheld for Final Payment shall include no less than One-Hundred Twenty-Five Percent (125%) of the total of all claims identified by the Contractor in the accounting submitted pursuant to Section 24.03-A, plus One-Hundred-Twenty-Five Percent (125%) of all unpaid claims against the Project by the County or any other claimant, which claims authorize a County withhold and/or retention pursuant to the Contract Documents, State or Federal law.

With the requests for Final Progress Payment, the Contractor shall submit its request for a final Contract Price Change Order with all information required by Article 17, and/or Contract Time Change Order, with all information required by Article 3, if the Contractor requests an adjustment in the Contract Price and/or Contract Time then in effect.

Section 25.02. CONTRACTOR ADMINISTRATOR'S ESTIMATE.

Upon receipt of all required submittals and the Contractor's Requests for Final Payments, the Contract Administrator shall conduct a final inspection to identify any deviations from the Contract Documents in the Work, and estimate the cost of corrections of such deviations.

After Final Inspection, the Contract Administrator shall prepare an estimate of the final sum due the Contractor. Said estimate shall take into account the Contract Price, as adjusted by any Change Orders; amounts previously paid; the Final Progress Payment; and sums to be withheld and/or retained for claims against the Project for incomplete work, liquidated damages, and for any other cause under the Contract. The Contract Administrator shall deliver a copy of this transmittal to the Contractor.

The Contract Administrator's estimate shall address whether the completion date for purposes of calculating liquidated damages should relate back to the date of the Contractor's Request for Final Payment, pursuant to Section 3.06.

Section 25.03. PROTEST TO PROCUREMENT MANAGER

If the Contractor contests the estimate of sums due prepared by the Contract Administrator, the Contractor shall, within five (5) days following delivery of the Contract Administrators' final inspection report, file his protest in writing with the Procurement Manager, setting forth in detail all grounds alleged to justify adjustment to the Contract Administrator's final estimate. Failure to file such protest shall constitute a waiver of the right to contest or otherwise challenge the Contract Administrator's final inspection report and estimate, and acceptance of the rest by Contractor.

Section 25.04. RESOLUTION AUTHORIZING ACCEPTANCE OF CONTRACT AND RECORDATION OF NOTICE OF COMPLETION.

Acceptance of the Work by the Board of Supervisors and the recordation of a Notice of Completion shall be in the manner prescribed by law, provided that the County is of the opinion that the Work is fully and satisfactorily completed and the provisions of the Contract Documents fully and satisfactorily performed in all respects. The acceptance of the Work by the County will only be made by resolution of the Board of Supervisors in a regular session. The Notice of Completion shall specify the date of the Resolution of Acceptance as the completion date and shall be recorded in the manner provided by law.

The County reserves all rights provided by law and/or the Contract Documents if the Work is not fully satisfactory and complete in all respects.

The resolution shall specify the final Contract Price and Time, with deductions and/or offsets for liquidated damages, the cost of correction of defective work or workmanship, inadequate clean-up, non-compliance with the Contract Documents, or statutory fines, forfeitures or penalties.

Section 25.05. DETERMINATION OF FINAL PROGRESS PAYMENT AND WITHHOLD AMOUNT.

After the Board of Supervisors has approved a Final Contract Price and Time, the Contract Administrator shall adjust the withhold Amount, as follows:

A. At no time shall the withhold amount be less than five (5%) percent of the Final Contract Price, or One-Hundred-twenty-Five (125%) percent of the total of all claims against the Project from all sources, including the County, whichever is the greater amount.

B. The Contract Administrator is authorized to withhold additional sums necessary to protect the County in his sole discretion, if claims, including State or Federal prevailing wage claims, and/or stop notices are filed, or to secure the County's own claims.

C. The Contract Administrator is authorized to process payment(s) to the Contractor at such frequency as the Contract Administrator shall determine, when the Contractor has provided acceptable submittals with its request(s) for release of withheld amounts, as specified in Section 25.06.

Section 25.06. SUBMITTALS FOR RELEASE OF WITHHELD AMOUNTS.

With its request for release of amounts withheld and/or retained by the County, the Contractor shall submit the following:

A. Receipts and releases on forms standard in the industry and approved by the County, from all first-tier subcontractors, releasing the County from all further claim or liability.

B. Receipts and releases, including Stop Notice releases if stop notices have been filed, from any persons or firms claiming against the Project; or fully executed agreements by such claimants specifying a settlement of their claims.

C. Releases and authorizations to pay from any State or Federal agency claiming against the Project, including prevailing wage claims.

D. Waiver of all claims by the Contractor against the County except those which the Contractor expressly specifies therein as being outstanding and not included in the waiver.

The maximum amount the Contractor may request to be released shall not exceed the amount specified in Section 25.05-A.

Section 25.07. ADMINISTRATION OF WITHHOLD ACCOUNT.

The County reserves all rights regarding its administration of the withhold fund, with or without filed Stop Notices, including all judicial remedies provided by law.

In its sole discretion, the County may contact such claimants, or any of them, and reach independent settlement of their claims, through use of warrants jointly payable to claimants or otherwise.

In addition, the County is authorized to retain sums as needed, in its sole discretion, to secure its own claims.

Section 25.08, PAYMENT OF WITHHELD AMOUNTS.

On the thirty-fifth (35th) calendar day following recordation of a Notice of Completion, the undisputed balance owing in the withhold account shall be due and payable to Contractor.

The "undisputed balance owing" shall be the difference between the final Contract Price fixed by the Board of Supervisors' Resolution of Acceptance less the following amounts:

A. All payments made to date;

B. One-Hundred-Twenty-Five (125%) percent of the total amounts claimed in unresolved stop notices on file with the County or wage claims and related penalties in the jurisdiction of any State or Federal wage compliance office;

C. The total of any claims by the County for defective work, and/or liquidated damages.

The balance owing shall be "due and payable" upon presentation by the Contractor of releases executed by the Contractor, releasing the County of Yolo from all claims arising by virtue of the Agreement for Construction related to the amounts released from the withhold.

Payment of undisputed contract amounts is contingent upon the Contractor furnishing the County with a release of all claims against the public entity arising by virtue of the Agreement for Construction. The Contractor shall specifically identify in the release any disputed claim, including the amount thereof, which is excluded from the release. Any claim not so specified within the release shall be forever released, discharged, and waived. If the Contractor disputes the amount owing by the County, the final balance in the Withhold Account shall become due and payable only upon execution by the Contractor and the County of an accord and satisfaction agreement acceptable to both, by which both release the other from all claims.

If the Contractor accepts the final balance in the Withhold Account as the total due and payable by the County, and provides a written final release, the accord and satisfaction agreement shall not be required.

Nothing in this Article shall be construed as requiring the Contractor to waive any claim against the County in violation of Public Contracts Code Section 7100, nor as constituting a waiver by the County of any claim or legal right against the Contractor.

Section 25.09. NON-WAIVER.

Neither acceptance of nor payment for the Work or any part thereof, nor any extension of time, nor any possession taken by the County shall operate as a waiver of any of the provisions of the Agreement for Construction, nor shall a waiver of any breach of this Agreement be held to be a waiver of any other or subsequent breach. In addition, adoption of a Resolution of Acceptance and recordation of a Notice of Completion shall not be deemed an acceptance of latent defects, shall not constitute a waiver of any of the provisions of the Agreement, and shall not relive the Contractor of its obligation to complete the work as specified in the Contract Documents and in compliance with all applicable laws and regulations.

Section 25.10. WORK AFTER NOTICE OF COMPLETION.

Contractor shall do no work after recordation of a Notice of Completion, save only work required by the warranties and guarantees provided under the Agreement for Construction.

Any work done after recordation of a Notice of Completion shall be conclusively presumed to be in furtherance of the Contractor's obligations on such warranties and guarantees for all purposes.

Section 25.11. STOP NOTICES; WHERE TO FILE; ENFORCEMENT.

All persons are advised hereby that all Preliminary Notices and Stop Notices shall be filed at the following address:

County of Yolo
Director of General Services
Yolo County General Services Department 120 West Main Street, Suite C
Woodland, CA 95695

The envelopes and the Notice shall clearly designate the name of the Project.

The Contractor shall cause the provisions of this Section to be inserted in all subcontracts and material contracts executed by the Contractor and notice of this provision shall be given to all persons furnishing materials for the Work.

All Stop Notice claimants are referred to Civil Code Section 3103 for the required contents of a Stop Notice, and Sections 3179 and following regarding enforcement/release of Stop Notice.

ARTICLE 26.

GUARANTEES AND WARRANTIES.

Section 26.01. GUARANTEE REQUIRED.

In addition to any guarantees required elsewhere by the Contract Documents, the Contractor shall guarantee the Work for a period of one (1) year from and after the recordation of the Notice of Completion, Notice of Cessation or, if neither is recorded, upon actual cessation of the Work. Such guarantee shall be made on the form provided, as set forth in Section 26.02 below.

Such guarantee is in addition to, and not in lieu of, the County's rights to enforce the Agreement for Construction in all respects, and the County's rights on all other guarantees and warranties required by the Technical Specifications.

Section 26.02. FORM OF GUARANTEE.

The guarantee required by this Article shall provide as follows:

The (Contractor) hereby unconditionally guarantees that the Work performed pursuant to the (Name of Project) Agreement for Construction (Yolo County Agreement No.) has been fully performed and completed in accordance with the requirements of the Agreement for Construction therefore and in compliance with all applicable laws and regulations, and further guarantees the Work of the Contract to be and remain free of defects in workmanship and materials for a period of one (1) year from the date of recordation of a Notice of Completion, Notice of Cessation, or actual cessation of work, whichever is longer. The Contractor hereby agrees to repair or replace any and all the Work, together with any adjacent Work which may have been damaged or displaced in so doing, that is not in accordance with the requirements of the Agreement and applicable laws and regulations, or that may be defective in its workmanship or material within the guarantee period specified, without any expense whatsoever to the County of Yolo, ordinary wear and tear excepted. The Contractor has provided contract bonds that will remain in full force and effect during the guarantee period.

The Contractor further agrees that within ten (10) calendar days after being notified in writing by the County of Yolo of any Work not in accordance with the foregoing requirements he will commence and prosecute with due diligence all Work necessary to fulfill the terms of this guarantee, and to complete the Work within a reasonable period of time. In the event he fails to so comply, he does hereby authorize the County of Yolo to proceed to have such Work done at the Contractor's expense and he will pay the cost thereof upon demand. The County shall be entitled to all costs, including reasonable attorney fees, necessarily incurred upon the Contractor's refusal to pay the above costs.

Notwithstanding the foregoing paragraph, in the event of an emergency constituting an immediate hazard to the health or safety of the employees or property of the County of Yolo, the County may undertake, at the Contractor's expense and without prior notice, all Work necessary to correct such hazardous condition when it was caused by the Work and/or the Contractor’s not being in accordance with the foregoing requirements, and to charge the same to the Contractor as specified in the preceding paragraph.

This guarantee set forth herein is not intended by the parties, nor shall it be construed, as in any way limiting or reducing the County of Yolo's rights to enforce all terms of the Agreement for Construction referenced hereinabove or the time for enforcement hereof. This guarantee is provided in addition to, and not in lieu of, the County's rights on such Agreement.

This Agreement is in addition to, and not in lieu of, the County's rights on all other guarantees and warrants required by the Contract Documents.

CONTRACTOR' SIGNATURE

(CORPORATE SEAL)

Section 26.03. GUARANTEE CONTRACT BOND.

Prior to Final Payment, the Contractor shall post a surety securing performance of his guarantee, as required by section 2.04 hereof.

Section 26.04. OTHER GUARANTEES.

All other guarantees or warranties required by the Contract Documents shall be subject to approval as to form by the County. At a minimum, such guarantees or warranties shall provide that the guarantor/warrantor shall repair or replace defective materials and/or workmanship, along with adjacent work that may be damaged or displaced in so doing and shall be unconditional. Such guarantees are in addition to, and not in lieu of, the product manufacturers' warranties, expressed or implied, and the Contractor's guarantee required by this Article.

Section 26.05. GUARANTEES NOT WAIVER.

By accepting the guarantees required by the Contract Documents, the County shall not be deemed to have waived any warranty or buyer protection implied, required and/or provided by the law of the State of California, nor to have altered any applicable statute of limitations regarding enforcement of any right of the County created by the Agreement for construction or otherwise. These guarantees and warranties are in addition to, and not in lieu of, such rights.

No disclaimer or limitation of any such right shall be valid unless properly executed by the County.

ARTICLE 27.

COUNTY'S RIGHT TO TERMINATE AGREEMENT.

Section 27.01. GROUNDS FOR TERMINATION.

The County may terminate the Agreement for Construction, pursuant to the provisions of this Article, for the following causes:

A. The Contractor has been adjudged bankrupt or has made a general assignment for the benefit of creditors, or that a receiver has been appointed on account of the insolvency of the Contractor.

B. The Contractor or any of his subcontractors violates any of the provisions of the Contract Documents or fails to perform the Work within the Contract Time specified in the Progress Schedule then in effect and approved by the County;

C. The Contractor or any of his subcontractors fails to make prompt payment to subcontractor or material men for material or for labor.

D. The Contractor or a subcontractor persistently disregards laws, ordinances, or the instructions of the County.

E. The Contractor fails to provide and keep in full force and affect all required insurance, and to cause all subcontractors to so comply.

F. Neglect of the work amounting to material breach of the Agreement for Construction.

G. Any other material breach by the Contractor.

Section 27.02. PROCEDURE FOR TERMINATION.

Upon the certification of the Contract Administrator that sufficient cause exists to justify the termination of the Agreement for the Construction, the County Administrator may, without prejudice to any other right or remedy of the County, give written notice to Contractor and his surety or sureties of its intention to terminate the Agreement.

Unless within seven (7) days of the giving of such notice, the Contractor shall cease such violation and make satisfactory arrangements for a correction thereof, the Agreement shall, upon the expiration of the said seven (7) days, cease and terminate.

In the event of any such termination, the County shall immediately give written notice thereof to the surety and to the Contractor and the surety shall have the right to take over and perform the Contract; provided, however, that if the surety within fourteen (14) days after service of the notice of termination, does not commence performance of the Contract, the County may take over the Work and prosecute the same to completion by contract or by any other method it may deem available, for the account and at the expense of the Contractor, and the Contractor and his sureties shall be liable to the County for any costs occasioned by the County thereby. In such event, the County may, without liability, take possession of and utilize in

completing the Work, such materials as may be on the Site of the Work and necessary, therefore. In any such case, the Contractor shall not be entitled to receive any further payment until the work is finished.

Section 27.03. RECONSTRUCTION IN EVENT OF LOSS.

In the event of a partial or total destruction of any or all of the work or materials to be provided pursuant to this Agreement, at any time prior to the final completion of the Project and the final acceptance of the Work by the County, the Contractor promptly shall reconstruct, repair, replace or restore, all work or materials so destroyed at no cost to the County.

Nothing herein provided shall in any way excuse the Contractor from the obligation of furnishing all the required materials and competing the Work in full compliance with the terms of the Contract Documents; provided that a reasonable time extension shall be negotiated by the parties.

This section shall not apply if the destruction is by an "Act of God" as defined in Public Contract Code Section 7105 and the loss is in excess of five percent (5%) of the total Contract price.

Section 27.04. OPTION IN EVENT OF A LOSS.

In the event that any destruction or loss should exceed twenty percent (20%) of the value of the construction completed to date, as determined at the end of the preceding month, or is due to an "Act of God" as defined above, the County shall have the option at its sole discretion to terminate this Contract.

Section 27.05. PROVISION FOR TERMINATION OF CONTRACT.

This Contract is subject to termination as provided by Section 4410 and 4411 of the Government Code, being portions of the Emergency Termination of Public Contracts Act of 1949.

ARTICLE 28.

ADDITIONAL PROVISIONS.

Section 28.01. CONFLICT OF INTEREST.

No official of the County who is authorized on behalf of the County to negotiate, make, accept, or approve, any architectural, engineering, inspection, construction, or materials supply contract, or any subcontract in connection with the construction of the Project, or any land acquisition in connection with the Project, shall become directly or indirectly interested personally in the Agreement for Construction or in any part thereof.

No officer, employee, architect, construction manager, attorney, engineer or inspector of or for the County who is authorized on behalf of the County to exercise any executive, supervisory, or other similar function in connection with the construction of the Project shall become directly or indirectly interested personally in the Agreement for Construction or any party thereof.

Section 28.02. NOTICES.

Any notice from one party to the other pursuant to the Contract Documents shall be in writing and shall be dated and signed by the party giving such notice or by a duly authorized representative of such party. Any such notice shall not be effective for any purpose whatsoever unless served in the following manners: If the notice is given to the Contract Administrator, it must be served personally at his office or by depositing same in the United States Mails, in a sealed envelope, correct postage prepaid, and correctly addressed to the address shown the Instructions to Bidders.

If the notice is given to the Contractor, it must be by personal delivery thereof to Contractor or to Contractor's Project superintendent at the Site of the Work, or by depositing the same in the United States Mails, in a sealed envelope, addressed to the Contractor at the place designated in the Bid by the Contractor for the receipt of correspondence.

If the notice is given to a surety of the Contractor, it must be by personal delivery to such surety or by depositing the same in the United States Mails, in a sealed envelope, addressed to such surety or other person at the address last communicated by him to the County. Copies of all such notices shall be delivered to the Contractor.

Section 28.03. NO VERBAL AGREEMENTS.

No verbal agreement or conversation with any officer, agent, or employee of the County, either before, during, or after the execution of the Contract Documents shall affect or modify any term or condition contained in the Contract Documents, nor shall such verbal agreement or conversation entitle the Contractor to any additional payment or time to perform whatsoever under the terms of the Agreement for Construction.

Section 28.04. EXAMINATION OF PROPOSED PROJECT LOCATION AND CONTRACT DOCUMENTS.

By submitting its Bid and executing the Agreement for Construction, the Contractor warrants that prior to bidding it carefully examined the location of the Project, that it carefully reviewed the Contract

Documents, and that it is fully aware of all the Work called for by the Contract Documents, the nature of the Site, and the requirements of all Specification including these General Conditions. The Contractor also warrants that it is familiar with all relevant circumstances and conditions affecting construction projects in Yolo County, California, and the particular site, and has the requisite experience and skill to perform the Agreement for Construction on the Site of the Project.

Section 28.O5. NOTICE OF POTENTIAL CLAIMS.

A. The Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act or failure to act, by the County or any of its officers, agents, or employees, or the happening of any event, thing or occurrence, unless he shall have given the County written notice of potential claims as specified herein.

The written notice of potential claims shall set forth the reasons for which the Contractor believes additional compensation should be paid, a firm estimate or accounting of the cost involved, and, insofar as possible, the total amount of the claim.

Such notice must have been given to the County prior to the time that the Contractor shall have performed the work giving rise to the potential claim if based on an act or failure to act by the County, or in all other cases within five (5) days after the happening of the event, thing, or occurrence giving rise to the potential claim or such other time as may be specified herein.

It is the intention of this Section that differences between the parties arising as a result of performance of the Contract shall be brought to the attention of the County at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence, for which no written notice of potential claim was filed as required by this section.

This subsection shall not supersede, but shall be superseded by, any provisions of these Contract Documents that specifically set forth the procedure for the Contractor to give notices of claims to the County in any particular case.

B. Any lawsuit, action or other proceeding seeking damages, costs, compensation or any other recovery, based upon any claim related to the Project, including but not limited to claims of the Contractor, subcontractors, suppliers, laborers and workers, must be preceded by a claim filed in accordance with Government Code Sections 900 et seq.

Section 28.06. CONTINUING WORK IN DISPUTE.

The Contractor shall not delay or suspend performance of the work pending resolution of any dispute or controversy between the County and the Contractor or any other person, firm, or entity involved in the Work.

If these General Conditions specify a procedure to resolve the particular issue, it shall be followed. If no specific procedure is specified, the Contractor shall give notice of the dispute as provided in Section 28.05.

The County's resolution of the issue shall be followed by all parties for the remainder of the Work. If notice has been filed pursuant to Section 28.05, the Contractor is authorized and shall request a Final Change Order to satisfy the unresolved Contract Price or Time claims arising from the issue, pursuant to Section 25.01.

Section 28.07 ASSIGNMENT OF CERTAIN CLAIMS

In entering into this contract, or any subcontract to supply goods, services, or materials pursuant to this contract, the Contractor and any subcontractor offers and agrees to assign to the County all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the contract or the subcontract. This assignment shall be made and become effective at the time the County tenders final payment to the Contractor, without further acknowledgment by the parties.

Section 28.08 NO THIRD-PARTY BENEFICIARIES

Except where specifically stated otherwise in the Agreement for construction, the promises in the Agreement benefit the COUNTY and CONTRACTOR only. They are not intended to, nor shall they be interpreted or applied to, give any enforcement rights to any other persons (including corporate) that might be affected by the performance or non-performance of this agreement, nor do the parties hereto intend to convey to anyone else any "legitimate claim of entitlement" with the meaning and rights that phrase has been given by case law.

END OF GENERAL CONDITIONS

TECHNICAL SPECIFICATIONS VOLUME II
PROJECT MANUAL

March 14, 2024

YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
Woodland, California

Job No. 21027
County Job No: WA20-106-3719-AG

buildingSMARTalliance™

Please consider the environment before printing this document

Comstock Johnson ARCHITECTS INC.
10520 Armstrong Avenue Mather, California 95655 Telephone: 916-362-6303

Section 00 01 06
SIGNATURE PAGE

YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
Woodland, California

Dave Helms, AIA
Architect
Comstock Johnson Architects, Inc.

Jeff Kovach, SE
Structural Engineer
Bevier Structural Engineering, Inc.

Mark Neeley, PE
Plumbing and Mechanical Engineer
Neeley Mechanical

Ben Schenkler, PE
Electrical Engineer
ECOM

* * *

Section 00 01 08
USER GUIDE FOR THE PROJECT MANUAL

PART 1 - SUMMARY:

1.1 GENERAL: This Guide is provided as a basis for understanding the organization and use of this Project Manual.

1.2 DEFINITIONS:

A. Construction Documents: Defined as the written and graphic documents prepared or assembled by the Architect for communicating the design of the project and administering the contract for its construction. These include the Bidding Requirements (Advertisement for Bids, Instructions to Bidders, and Bid Forms) and the Contract Documents.

B. Contract Documents: Defined as the legally enforceable requirements that become part of the contract when the agreement is signed, these include the Contract Forms, Conditions of the Contract, Specifications, Drawings, Addenda, and Contract Modifications. They describe the proposed construction (referred to as the "Work") that results from performing services, furnishing labor, and supplying and incorporating materials and equipment into the construction.

C. Contract Forms: Include the agreement, bonds and certificates.

D. Conditions of the Contract: Define the basic rights, responsibilities, and relationships of the parties involved in the construction process.

E. Specifications: Divided into 50 Divisions, the Specifications define the qualitative requirements for products, materials, and systems and the standards of workmanship required for installation. Division 01 sections constitute the GENERAL REQUIREMENTS necessary for the Project; Divisions 02 through 49 comprise the Technical Specifications portion of the Project Manual.

F. Drawings: Graphic representations of the Work, which show the materials and their relationships to one another, including sizes, shapes, fit, location, and connections.

G. Addenda: Written or graphic documents issued to clarify, revise, add to, or delete information in the original bidding documents or in previous addenda.

H. Contract Modifications: Written instruments used to add to, delete from or otherwise modify the Work after the construction agreement has been signed.

1.3 DIVISION 01 - GENERAL REQUIREMENTS: Division 01 of the Specifications expands on certain of the broad provisions of the Conditions of the Contract and governs the execution of all Technical Sections of the Specifications. Sections included in Division 01 specify the administrative and procedural requirements, as well as temporary facilities, required for the Project. All requirements stated in Division 01 apply to and will be in force for all subsequent Sections included in Divisions 02 through 49.

1.4 PRODUCT REFERENCES: Specification Section numbers and titles follow the latest recommendations of MasterFormat™ 2010 Edition published by the Construction Specifications Institute (CSI). The Section titles represent work results and may be stated in the singular or plural without regard to the actual quantity used on the project. The organization of specifications by Section is not meant to define subcontracts or other divisions of work by trades.

1.5 MANUAL FORMAT:

A. General: The first page of each Section appears as a facing (right-hand) page and is graphically defined with very large and boldfaced Section number and title. Succeeding pages of each Section are printed back-to-back, with header in normal-sized boldface type that has the Section number and page number appearing in the upper outside corner of the page.

B. Underlined and Boldface Type: Underlining and bolding have been used in different combinations throughout the Project Manual to highlight significant text. These devices have been used to assist the user in finding items of information or to emphasize the importance of certain information. No other meaning is attached to the use of boldface and underlined text.

C. Dates: The official date of issue of the Project Manual appears on the cover sheet of this Project Manual. Dates subsequent to that date on individual Section pages indicate reissue of entire Sections for clarification.

1.6 DEFINITIONS AND INTERPRETATIONS:

A. Words and Terms: Those which are frequently used, with special meanings, in this Project Manual are defined in Section 01 42 00 - REFERENCES.

B. Governing Dictionary: The definitions of words used in these Specifications, which are not defined in Section 01 42 00 - REFERENCES, the General Conditions, or in referenced standards, are as given in "The American Heritage Dictionary of the English Language".

C. Specification Language: These Specifications are written in the imperative mood, as defined in the Construction Specifications Institute's Manual of Practice. Imperative language is directed to the Contractor. The indicative mood is employed on occasion when such sentence structure is necessary to convey the intended meaning in a more accurate or understandable form. The text is streamlined, with the colon (:) employed as a symbol for the words "shall be", "shall have", "shall conform with", "shall comply with", or "shall meet the requirements of". The colon is also used to separate a paragraph title or heading from the text that follows.

* End 00 01 08 *

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N/A

* End 00 01 10 *

PROCUREMENT REQUIREMENTS

NOT INCLUDED AT THIS TIME

* End Procurement Requirements *

Section 00 31 19
EXISTING CONDITION INFORMATION

PART 1 - GENERAL

1.1 Drawings: Drawings, in so far as they exist, may be examined at the office of the Architect.

1.2 Interpretation:

A. The access to the drawings is provided only for bidder's information and convenience and is not part of the Contract Documents. Owner and Architect do not warrant the accuracy or extent of the survey.

B. Interpretation of the existing drawings is bidder's responsibility. Owner and Architect will not be responsible for interpretation of survey by bidders.

C. Bidders are urged to examine the drawings and the site.

D. Refer to Conditions of the Contract for additional information.

* * *

00 - CONTRACTING REQUIREMENTS

NOT INCLUDED AT THIS TIME

* End Procurement Requirements *

Division 01 - GENERAL REQUIREMENTS

Section 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 THE PROJECT: The name of the Project is Yolo County Ag Department Shops Building. The project site is located at 125 West Main Street, Woodland, CA.

1.2 RESPONSIBLE PARTIES: Construction of this Project is governed by the agreement between the Owner and the Contractor. Statements in the specifications are directed to this contractor, who has overall responsibility for the subcontractors.

1.3 COMMUNICATIONS: Written or graphic communications during construction shall be documented using PDF technology.

1.4 WORK COVERED BY THE CONTRACT DOCUMENTS:

A. General: Under a single contract construct building modifications, including building and site improvements in conformance with Drawings and Specifications prepared by Comstock Johnson Architects, Inc., Mather, CA, and bound herewith.

1.5 REQUIREMENTS:

A. Requirements for Sequencing or Scheduling:

1. General: Begin work as identified in the GENERAL CONDITIONS, proceed as shown in the Progress Schedule as required under Section 01 32 14 - PROGRESS SCHEDULE, and complete work within the limits designated in the OWNER-CONTRACTOR AGREEMENT.
2. Schedule of Work: Coordinate work to accommodate the Owner's operations and use of premises during construction period; coordinate construction schedule and operations with Owner's Representative; indicate all special requirements in the Progress Schedule as specified.
3. Deferred Submittal Procedures: Portions of the documentation for this project are to be developed, submitted and permitted as deferred approval by the Contractor as identified in Section .

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 CONTRACTOR'S USE OF PREMISES:

A. General: Confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents; do not unreasonably encumber the site with materials or equipment.

B. Coordination with Occupants: Do not interfere with Owner's activities in and about existing facilities. Disruption of Owner's operations will be acceptable only with prior agreement with the Owner. Ten (10) days minimum notice will be required, including establishment of a firm schedule for operations.

C. Storage: Contractor is responsible for protection and safekeeping of products stored on the site.

3.2 PROTECTION: Erect temporary barricades, warning signs and substantial handrails to protect persons in and around the work areas and observe safety precautions. Conform to applicable OSHA rules and regulations and State Safety Regulations and Orders.

* * *

Section 01 23 00
ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY: This Section includes administrative and procedural requirements governing Alternates. Each Alternate is identified by number and describes the basic changes to be made in the Work.

1.2 DEFINITION: An alternate is an amount proposed by bidders and stated on the Bid Form for work defined in the Bidding Requirements that the Owner may elect to add to the Base Bid amount, if the Owner decides to accept a corresponding change, in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 RELATED REQUIREMENTS:

A. Materials and Methods Required by Alternates: Pertinent Specification Sections.
B. Form for Submitting Proposed Alternate Amounts: Section 00 41 00 - BID FORM.
C. Incorporation of Alternate into the Work: Section 00 53 10 - OWNER-CONTRACTOR AGREEMENT.

PART 2 - PRODUCTS

2.1 ALTERNATE BIDS: Alternates will be accepted at option of Owner; the Base Bid, including Alternates accepted by Owner, will be an element considered in the award of the Contract.

2.2 SCHEDULE OF ALTERNATES:

A. Alternate No. 1 -
B. Alternate No. 2 -

PART 3 - EXECUTION

3.1 MODIFICATIONS TO WORK:

A. General: Execute accepted alternates under the same conditions as other Work of this Contract.
B. Notification: Immediately following the award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate whether alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
C. Coordination: Modify or adjust affected adjacent Work as required to completely and fully integrate that Work into the Project.

* * *

Section 01 25 00
SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY: This Section includes administrative and procedural requirements for handling requests for substitutions.

A. Definitions:

1. General: Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
2. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents that are proposed by the Contractor after award of the Contract are considered to be requests for substitutions.

1.2 PRODUCT OPTIONS: Refer to Section 01 60 00 - PRODUCT REQUIREMENTS.

1.3 SUBMITTALS:

A. Products List: Include products for which Contractor proposes a substitution in the Products List submitted under Section 01 60 00 - PRODUCT REQUIREMENTS.

B. Substitutions:

1. General: For any request for "accepted equal" or substitution, submit electronic copy (PDF) of completed and signed Substitution Request (form included at the end of this Section) with required substantiating data.
2. Substantiating Data:
   a. Required Information: Provide product identification; manufacturer's name and address; manufacturer's literature including product description, performance and test data and all reference standards; samples; and name and address of similar projects using the product, including dates of installation and names of Architect and Owner.
   b. Data Comparison: Submit a side-by-side, item-by-item comparison of all characteristics of the specified product and the proposed product.
   c. Construction Schedule: Provide statement of effect of substitution on construction schedule.
   d. Cost Comparison: Submit cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.

C. Architect's Action: If necessary, the Architect will request additional information or documentation for evaluation within one (1) week of receipt of a request for substitution. The Architect will notify the Contractor of acceptance or rejection of the substitution within two (2) weeks of receipt of the request, or one (1) week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a Change Order.

D. Distribution: Accepted substitution requests will be distributed as electronic copy (PDF) to the Architect, Owner, and Contractor.

1.4 COORDINATION: Architect's acceptance of product as "equal" or as a substitution does not relieve Contractor from responsibility for compliance with requirements of any portion of Contract Documents; Contractor shall be responsible, at Contractor's own expense, for any changes in other parts of the Work which may be caused by such substitution.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

* * *

SUBSTITUTION REQUEST FORM

TO: Comstock Johnson Architects, Inc.

PROJECT: Yolo County Ag Department Shops Building

SPECIFIED ITEM: _____

Section No.: ____ Page No.: ____ Paragraph No.: ____ Description: _____

Reason for Request: _____

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: _____

Attached data includes product description, specifications, drawings, photographs, performance and test data required for evaluation of request; applicable portions of data are clearly identified.
Attached data also includes a description of changes to Contract Documents which proposed substitution will require for its proper installation.
The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by:

Signature: _____

Contractor: _____

Address: _____

Date: Telephone: _____

Attachments: _____

For use by Architect:

[ ] Accepted.
[ ] Not Accepted.
[ ] Accepted as noted.
[ ] Received too late.

By: _____

Date: _____

Remarks: _____

Section 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION: Requirements for documentation of changes in the Work, as defined in the GENERAL CONDITIONS and SUPPLEMENTARY CONDITIONS.

1.2 CHANGE PROCEDURES:

A. Authorized Agent: Submit to Architect the name of the individual authorized to receive change documents and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. Proposal Request: Architect may issue a Proposal Request on AIA Document G709 - Work Changes Proposal Request, which includes a detailed description of a proposed change in the Work. Contractor will prepare and submit an estimate within ten (10) days.

C. Request for Change: Contractor may propose a change by submitting a written request to the Architect, describing the proposed change and its full effect on the Work; include a statement describing the reason for the change, the effect on the Contract Sum/Price and Contract Time with full documentation, and a statement describing the effect on work by separate or other contractors. Document any requested substitutions in accordance with Section 01 25 00 - SUBSTITUTION PROCEDURES.

D. Distribution of Completed Documents: Completed Change Orders, Construction Change Directives, and Architect's Supplemental Instructions will be in PDF form.

1.3 CHANGE ORDERS:

A. Format: Issued by Architect to order changes to the work which involve a change in Contract Price and/or Contract Time, on AIA Document G701 - Change Order, signed by Architect, Owner and Contractor.

1. Documentation of Change in Contract Price And/or Contract Time:
2. General: Maintain detailed records of work done on a time and material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.
3. Quotation Breakdown: Itemize each quotation for a change in cost or time in sufficient detail to allow evaluation of the quotation. As a minimum, itemize separately each significant material and equipment purchase and the work of each trade and subcontractor.
4. Supporting Data:
   a. Costs: Separate costs for products, labor, equipment, and subcontractor quotations.
   b. Quantities: Products, labor, and equipment.
   c. Taxes, Insurance and Bonds: As required.
   d. Overhead and Profit: As required.
   e. Justification: Change in Contract Time.
   f. Credit: For deletions from Contract, similarly documented.
   g. Additional Data: On request, as required to support computations.
5. Claim for Additional Costs:
   a. General: Support each claim for additional costs, and for work done on a time and material basis, with the following additional information:
   b. Origin and Date of Claim: State name and originator and date.
   c. Dates and Times: When work was performed and by whom.
   d. Time Records and Wage Rates: As recorded and paid.
   e. Invoices and Receipts: For products, equipment, and subcontracts, similarly documented.

B. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.4 CONSTRUCTION CHANGE DIRECTIVE: Issued by Architect, signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. The document will describe changes in the Work, and will designate method of determining any change in Contract Price or Contract Time. Promptly execute the change in Work.

1.5 ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS: Issued by Architect to provide supplemental instructions, interpretations, or order minor changes in the Work not involving an adjustment to Contract Price or Contract Time.

PART 2 - PRODUCTS

2.1 TYPES OF CHANGE ORDERS:

A. Stipulated Price Change Order: Based on Proposal Request and Contractor's maximum price quotation or Contractor's request for a Change Order approved by Architect.

B. Unit Price Change Order:

1. General: For unit costs or quantities of units of work which are not pre-determined, execute Work under a Construction Change Directive.

2. Pre-determined Unit Prices and Quantities: Change Order will be executed on a fixed unit price basis.
3. Changes in Contract Price or Contract Time: Computed as specified for Time and Material Change Order.

C. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. Architect will determine the change allowable in Contract Price and/or Contract Time as provided in the Contract Documents. Maintain detailed records of work done on time and material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

PART 3 - EXECUTION

3.1 CORRELATION OF CONTRACTOR SUBMITTALS:

A. General: Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum/Price.
B. Progress Schedule: Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust time for other items of work affected by the change, and resubmit.
C. Record Documents: Record authorized changes in Project Record Documents.

* * *

Section 01 26 31
INFORMATION REQUEST PROCEDURE

PART 1 - GENERAL

1.1 DESCRIPTION: Submit request for information, interpretation and/or clarification to the Architect promptly upon identification of need, and in reasonable time so as not to affect the progress of the Work.

1.2 SUBMISSION PROCEDURES:

A. General: Request for information beyond that set forth in the Contract Documents will be considered only when the request is in writing and fully documented.

B. Time: Identify and submit requests for information in a timely manner.

C. Pre-submission Review: Before submitting request to the Architect, Contractor shall conduct a review to determine that the information requested, including items submitted by subcontractors or suppliers, is not shown in the Contract Documents.

D. Category of Request:

1. General: Submit requests for information when one or more of the following conditions occur:
2. Need for Clarification: When information shown or indicated in the Contract Documents is unclear in its intent.
3. Unforeseen Condition: Discovery of unforeseen condition or circumstance that is not shown or indicated in the Contract Documents.
4. Conflict Within Documents: Discovery of an apparent inconsistency, conflict or discrepancy between different portions of the Contract Documents, where the intent cannot be reasonably inferred from information shown or indicated.
5. Omission: Discovery of what appears to be an omission in the Contract Documents, where the intent cannot be reasonably inferred from information shown or indicated.
6. Coordination Problem: Discovery of unforeseen condition in coordinating placement of work that is specifically related to the Contract Documents.

E. Unacceptable Requests:

1. General: Do not submit requests for information for confirmation of any action already taken by the Contractor. Requests will not be accepted that imply confirmation of any unauthorized change to the Work.
2. Untimely Submission: A request for information that is submitted in a belated manner without proper coordination and scheduling of the Work of related subcontractors will not be reviewed and will be returned to the Contractor.
3. Submittal: A request for information that is included as part of a submittal will not be processed; see Section 01 33 10 - SUBMITTALS.
4. Substitution: A request for information that is a request for substitution will not be processed; see Section 01 25 00 - SUBSTITUTION PROCEDURES.
5. Exclusionary Submission: A request that implies that specific portions of the work are assumed to be excluded or considering a separate portion of the Contract Documents in part rather than as a whole will not be processed.

F. Log: Contractor shall prepare and maintain the official log of requests for information. Review status of log at each job progress meeting.

PART 2 - PRODUCTS

2.1 SUBMISSION REQUIREMENTS:

A. Request for Information (RFI) Form:

1. General: Provide a completed and legible PDF of the RFI Form included at the end of this Section with each submittal.
2. RFI Number: Identify RFIs sequentially starting from number one (1); number re-submissions with same number as original and add letter designation A., B., C., etc., in order submitted, until resolution is achieved.
3. Contractor: Provide company name and mailing address with signature of contact person responsible for work on this Project, certifying to review of RFI.
4. Subcontractor and/or Supplier: Provide company name, mailing address, telephone number and name and email of contact person responsible for work on this Project.
5. RFI Description:
   a. General: Describe subject of RFI completely.
   b. Specifications References: Identify specification section number and paragraph number under consideration.
   c. Drawing References: Identify specific drawing number and/or detail number under consideration.
   d. Attachments: Identify as required, to support description.
6. Contractor's Proposed Resolution:
   a. General: Describe suggested resolution; support with attachments as required.

b. Cost Impact: Indicate impact on costs; explain Contractor's original basis for bid and, based on the current request, reason that additional costs should be considered.
c. Time Impact: Indicate effect on schedule; explain Contractor's original basis for bid and, based on the current request, why a time extension should be considered.

PART 3 - EXECUTION

3.1 ARCHITECT'S RESPONSE:

A. General: Architect will respond on the RFI Form and include attachments, as referenced. Verbal responses to such requests are to be considered informational; official written response will only be given on annotated PDF of original RFI Form.
B. Architect's Review:
1. General: Allow fourteen (14) calendar days after receipt. If more than ten (10) requests are received within one (1) calendar week, the Architect will specifically schedule and extend response time as required to accomplish the reviews.
2. Prioritization: If more than five (5) requests have been received by the Architect, the Contractor shall identify the order of requests most critical to the schedule of the Project.

3.2 DISTRIBUTION:

A. General: Submit PDF of original, signed copy. PDF with the official response will be returned to the Contractor.
B. Consultants: The Architect will distribute copies of requests for information to project consultants, as required for their participation. Direct communication and response between project consultants and Contractor will be considered informational only.
C. Response: The Contractor will make and distribute copies of the official response to subcontractors and suppliers, as required.

* * *

REQUEST FOR INFORMATION

PROJECT NAME: YOLO COUNTY AG DEPARTMENT SHOPS BUILDING WOODLAND, CALIFORNIA	JOB NO. 21027 RFI NO.

TO: COMSTOCK JOHNSON ARCHITECTS, INC. 10520 ARMSTRONG AVENUE MATHER, CA 95655	FROM:

SUBJECT:

CATEGORY:
☐ NEED FOR CLARIFICATION ☐ OMISSION
☐ UNFORESEEN CONDITION ☐ COORDINATION PROBLEM
☐ CONFLICT WITHIN DOCUMENTS ☐ OTHER _____

SPEC. SECTION	PARAGRAPH NO.	DRAWING NO.	DETAIL NO.

DESCRIPTION:

CONTRACTOR'S PROPOSED RESOLUTION:

☐ ATTACHMENTS:

☐ COST IMPACT: $_____ EST. ☐ TIME IMPACT: _____ EST.

CONTRACTOR SIGNATURE:	DATE:

RESPONSE:

☐ ATTACHMENTS:

ARCHITECT SIGNATURE:	DATE:

Section 01 29 00
PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SCHEDULE OF VALUES:
- A. Description: Submit PDF of Schedule of Values to the Architect at least ten (10) days prior to submitting first Application for Payment. Schedule of Values will be used as basis for, and review of, Contractor's Applications for Payment.
- B. Substantiation: Upon request by the Architect, support values given with data that will substantiate their correctness.
- C. Quantities: Submit quantities of designated materials, if applicable.
- D. Payment for materials: Materials stored on or off site will be limited to those materials listed in Schedule of Unit Material Values.

1.2 PROGRESS PAYMENTS: Submit applications for payment to the Architect in accordance with the schedule established by the OWNER-CONTRACTOR AGREEMENT and the GENERAL CONDITIONS.

PART 2 - PRODUCTS

2.1 FORM OF SUBMITTAL FOR SCHEDULE OF VALUES:
- A. General: Submit typed schedule on AIA Document G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form of electronic media printout will be considered as an alternative.
- B. Format: Use the Table of Contents of this Project Manual as the basis for format for listing costs of work specified in Divisions 02 through 49.

2.2 FORM OF SUBMITTAL FOR APPLICATIONS FOR PAYMENT:
- A. General: Prepare itemized applications typed on AIA Document G702 - Application and Certificate for Payment and AIA Document G703 - Continuation Sheet For G702.
- B. Format: Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- C. Change Orders: List each authorized Change Order as an extension on AIA G703 - Continuation Sheet, listing Change Order number and dollar amount as for an original item of work.
- D. Mechanics Lien Guarantee: Provide guarantee of lien releases sufficient to cover previously released payments.
- E. Final Payment: Prepare Application for Final Payment as specified in Section 01 77 00 - CLOSEOUT PROCEDURES.

PART 3 - EXECUTION

3.1 PREPARATION OF SCHEDULE OF VALUES:
- A. Line items: Identify each line item with the number and title of its specification section.
- B. Installed Costs:
  1. General: Break down installed costs into the delivered cost of product, with taxes paid, and the total installed cost, with overhead and profit.
  2. Installed Values: For each line item which has an installed value of more than $10,000, break down the costs to list major products or operations under each item.
  3. Figures: Round off to the nearest dollar.
  4. Sum: Make the sum of total costs of all items listed in the schedules equal to the total Contract Sum.
- C. General Cost Items: Itemize separate line item costs for each of the following:
  1. Performance and payment bonds.
  2. Field supervision and layout.
  3. Scheduling.
  4. Temporary facilities and controls.

3.2 PREPARING SCHEDULE OF UNIT MATERIAL VALUES:
- A. Stored Materials: Submit a separate schedule of unit prices for materials to be stored on which progress payments will be made.
- B. Identification: Make the form of submittal parallel to the Schedule of Values, with each line item identified the same as the line item in the Schedule of Values.
- C. Unit Prices: Include in the unit prices only the cost of material, delivery and unloading at site, and sales taxes.
- D. Cost: Make sure that the unit prices multiplied by quantities are given an equal material cost of that item in the Schedule of Values.

3.3 REVIEW AND RESUBMITTAL OF SCHEDULE OF VALUES: After review by the Architect, revise and resubmit the schedule (and the Schedule of Unit Material Values) as required. Revise schedule to list approved Change Orders, with each Application for Payment.

3.4 PROCEDURE FOR PROGRESS PAYMENTS:

A. Required Copies: Submit PDF of notarized original of each Application for Payment.

B. Payment Period: Submit at intervals stipulated in the OWNER-CONTRACTOR AGREEMENT.

* * *

Section 01 31 00
PROJECT MANAGEMENT & COORDINATION

PART 1 - GENERAL

1.1 SUMMARY: Coordinate scheduling, submittals, and Work of the various sections of these Specifications to assure the efficient and orderly sequence of installation of each part of the Work. Coordinate construction operations included under different sections that depend on each other for proper installation, connection, and operation.

1.2 SUBMITTALS:

A. General: Within seven (7) calendar days of receipt of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the superintendent and other key personnel in attendance at the Project Site. Identify each individual by name, title, and provide a description of their duties and responsibilities. Update list within seven (7) calendar days of any staff change.

B. Communications: Submit written procedures for Project communications including submittals, reports and records, schedules, coordination drawings, and recommendations.

C. Coordination Drawings: Submit as required under Section 01 33 10 - SUBMITTALS. Prepare where careful coordination is required for installation of products and materials fabricated by separate entities and/or where limited space availability requires maximum utilization of space for efficient installation of different components. Show the relationship of components and required installation sequences.

1.3 SCHEDULING:

A. General: Refer to Section 01 32 14 - PROGRESS SCHEDULE.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures such as preparation of schedules, installation and removal of temporary facilities, delivery and processing of submittals, progress meetings, and Project closeout activities, with other construction activities to avoid conflicts and assure orderly progress of the Work.

1.4 MEETINGS:

A. General: Schedule and administer meetings throughout progress of the Work at biweekly intervals.

B. Duties: Schedule meetings, prepare agenda with copies for participants, preside at meetings, and distribute copies of minutes within two (2) days of receipt from the Owner’s Representative to the participants and those affected by decisions made.

C. Attendance Required: Job superintendent, major subcontractors and suppliers, and the Architect, as appropriate to agenda topics for each meeting.

D. Agenda: Include review of minutes of previous meeting; review of Work progress; field observations; problems and decisions; review of submittals schedule and status of submittals; review of off-site fabrication and delivery schedules; maintenance of progress schedules; corrective measures to regain projected schedules; planned progress for succeeding work period; projected progress of coordination; maintenance of quality of work standards; effect of proposed changes on progress schedule and coordination; other business relating to Work.

1.5 CONSTRUCTION MOBILIZATION: Coordinate the use of the site and facilities. Allocate mobilization areas of site; allow for field offices and sheds, access, traffic, and parking facilities.

PART 2 - PRODUCTS

2.1 MATERIALS: Refer to Section 01 60 00 - PRODUCT REQUIREMENTS.

PART 3 - EXECUTION

3.1 PERFORMANCE: Refer to Section 01 73 10 - EXECUTION REQUIREMENTS.

* * *

Section 01 32 14
PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 DESCRIPTION: Within fifteen (15) days after award of the Contract, submit to the Architect estimated construction progress schedules for the Work, with sub-schedules of related activities essential to its progress.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE: Refer to Section 01 31 00 - PROJECT MANAGEMENT AND COORDINATION for scheduling administrative procedures and project meeting requirements.

1.3 SUBMITTALS:

A. General: Submit progress and submittal schedules in PDF form.

B. Progress Schedule: Submit preliminary schedule for review; after review, resubmit required construction schedule with revised data within ten (10) days.

C. Submittal Schedule: Refer to Section 01 33 10 - SUBMITTALS; paragraph 1.C.3 Submissions for submittal scheduling requirements.

D. Revised Schedules:

1. Progress Schedule: Submit with Application for Payment; refer to Section 01 29 00 - PAYMENT PROCEDURES.
2. Submittal Schedules: Distribute five (5) days before initial Project Meeting; thereafter with agenda for subsequent biweekly project meetings.

E. Distribution: Distribute copies of reviewed Schedules to project site, subcontractors, suppliers, and other concerned parties. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Schedules.

1.4 CONTENT:

A. Progress Schedule:

1. General: Prepare Schedule as a horizontal bar chart with separate bar for each major portion of Work or operation, identifying first work day of each week. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction. Comply with procedures contained in AGC's "Construction Planning & Scheduling."
2. Content:
   a. Sequence of Listings: The chronological order of the start of each item of Work.
   b. Phases: Identify work of separate stages and other logically grouped activities. Provide sub-schedules for each stage of Work identified in Section 01 11 00 - SUMMARY OF WORK. Provide sub-schedules to define critical portions of the entire Schedule.
   c. Items of Work: Identify each item by specification section number.
   d. Owner Furnished Products: Indicate delivery dates.
   e. Percentage of Completion: Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
   f. Schedule of Values: Coordinate content with Schedule of Values specified in Section 01 29 00 - PAYMENT PROCEDURES.

B. Submittals Schedule:

1. General: Provide a complete list of specified Submittals by Section Number in PDF form. Maintain, update and distribute list, identifying dates of submittal receipt and return of reviewed submittals, for evaluation at scheduled biweekly project meetings.
2. Specified Submittals: Identify required submittal dates for shop drawings, product data, and samples, etc.
3. Reviewed Submittals: Date review of submittal will be required from Architect.
4. Selection of Finishes: Indicate decision dates.

1.5 REVISIONS TO SCHEDULES:

A. General: Indicate progress of each activity to date of submittal, and projected completion date of each activity.

B. Revisions: Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.

C. Reports: Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION
Not Used.

* * *

Section 01 33 10
SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION: Submit certifications, shop drawings, product data/material lists, manufacturer's instructions, and samples to the Architect for review as required.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE:
- A. General: Specific submittal requirements are identified in the individual Sections of these specifications.
- B. Product Substitution Procedures: Refer to Section 01 25 00 - SUBSTITUTION PROCEDURES; products lists and substitution requests.
- C. Schedule of Values: Refer to Section 01 29 00 - PAYMENT PROCEDURES.
- D. Requests for Information (RFI): Refer to Section 01 26 31 - INFORMATION REQUEST PROCEDURE.
- E. Progress Schedule: Refer to Section 01 32 14 - PROGRESS SCHEDULE.
- F. Testing Laboratory Services: Refer to Section 01 45 23 - TESTING AND INSPECTION SERVICES; test reports.
- G. Closeout Procedures: Section 01 77 00 - CLOSEOUT PROCEDURES; operating and maintenance manuals, record drawings, and guarantees.

1.3 SUBMITTALS SCHEDULE: Prepare schedule for submission of submittals requiring action by the Architect; arrange in a tabular format including scheduled date for first submittal, specification Section number and title, submittal category (action or informational), name of subcontractor, description of the Work covered and scheduled date for Architect's final release or approval.

1.4 SUBMISSION PROCEDURES:
- A. General: Schedule submissions a minimum three (3) weeks before required for use.
- B. Submittal Requirements:
  1. General: Conform to specified procedures in submission of required submittals.
  2. Specified Products and Alternate Manufacturers: Products of specified manufacturers and named acceptable alternate manufacturers require submission of listed submittals.
  3. "Accepted Equals" and Substitutions: See Section 01 25 00 - SUBSTITUTION PROCEDURES; requests for acceptance of products as "equal" or as substitution shall include listed submittals for subject products, requirements of the Substitution Request, and be submitted within the time frames specified in Section 01 25 00 - SUBSTITUTION PROCEDURES.
- C. Submissions:
  1. General: After issuance of Notice to Proceed make submissions no later than the following number of days, unless specified otherwise in individual specification Section.
  2. Early Start and/or Long Lead-Time Items: 30 calendar days.
  3. Color Selection Items: 30 calendar days.
  4. Electrical, Mechanical and Equipment Items: 60 calendar days.
  5. All Other Items: 90 calendar days.

1.5 SUBMISSION REQUIREMENTS:
- A. Cover Sheet:
  1. General: Provide a completed copy of the Submittal Cover Sheet included at the end of this Section with each submittal. Complete identified areas of the form as follows:
  2. Submittal Number: Identify first submittal as number one (1); number re-submittals, if required, with succeeding numbers.
  3. Specification Section: Identify submitted work with section number shown in the Project Manual. Provide separate submittals for each specification section, as required.
  4. Contractor: Provide company name and mailing address with signature of contact person responsible for work on this project, certifying to review of submittal, verification of field requirements and compliance with Contract Documents.
  5. Subcontractor: Provide company name, mailing address, telephone number and name of contact person responsible for work on this project.
  6. Submittal Description:
     - a. General: Describe contents of submittal completely; identify if material is a resubmittal, and give previous submittal number.
     - b. Submittal Index: List items included in submittal; properly cross reference to Contract Documents.
- B. Identification of Submittals:
  1. Date: Submission date and revision dates.
  2. Project: Project name and number; names of Architect, Contractor, and Subcontractor as shown on Submittal Cover Sheet.
  3. Product or Material: Name of manufacturer, product name or model number, and supplier.
  4. Contractor's Stamp: Initialed or signed, certifying to review of submittal, verification of field requirements and compliance with contract documents.

C. Number of Copies Required:
   1. Submittal Schedule, Certifications, Shop Drawings, Product Data/Material Lists and Manufacturer's Instructions: Electronic copy (PDF) of each submittal.
   2. Samples:
      a. General: As identified in individual specification section.
      b. Color/Pattern Selection: One set of manufacturer's complete range for initial selection; additional samples as requested of selected color/pattern for final color schedule.

1.6 SUBMITTALS:

A. Shop Drawings:
   1. General: Submit manufacture and installation details, including fastenings, for review. Make drawings legible and complete in every respect. Show relationship to adjacent structure or material; clearly identify all field dimensions.
   2. Variations: If shop drawings show variations from Contract requirements because of standard shop practice or other reason, specifically note such variations in letter of transmittal, as well as on drawings.
   3. Distribution: Reviewed shop drawings will be returned to Contractor for subsequent action, as required.
      a. No Resubmittal Required: Electronic copy (PDF) sent; Contractor may make copies for distribution.
      b. Resubmittal Required: Electronic copy (PDF) sent. Make corrections to original drawings and send new electronic copy (PDF) to Architect for review. Secure final review prior to commencing work.

B. Product Data/Material Lists:
   1. Manufacturer's Standard Schematic Drawings:
      a. General: Provide standard drawings; delete information not applicable to Project.
      b. Additional Information: Supplement standard information as required for Project.
   2. Product Data:
      a. General: Provide manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.
      b. Identification: Clearly mark each copy; identify required materials, products or models.
      c. Required Information: Provide dimensions and clearances required; performance characteristics and capacities; and diagrams of equipment and controls.
   3. Distribution: Reviewed product data will be returned to Contractor for subsequent action, as required.
      a. No Resubmittal Required: Electronic copy (PDF) sent; Contractor may make copies for distribution.
      b. Resubmittal Required: Electronic copy (PDF) sent. Make corrections to original drawings and send new electronic copy (PDF) to Architect for review. Secure final review prior to commencing work.

C. Manufacturer's Instructions:
   1. General: Submit most recent applicable printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing of the subject material, as provided by the manufacturer for use under conditions similar to those of this Project.
   2. Distribution: Reviewed manufacturer's instructions will be returned to Contractor for subsequent action, as required.
      a. No Resubmittal Required: Electronic copy (PDF) sent; Contractor may make copies for distribution.
      b. Resubmittal Required: Electronic copy (PDF) sent. Make corrections to original drawings and send new electronic copy (PDF) to Architect for review. Secure final review prior to commencing work.

D. Samples:
   1. General: Submit samples to illustrate functional and aesthetic characteristics of product, with integral parts and attachment devices.
   2. Finishes: Submit manufacturer's full range of standard colors, patterns and textures.
   3. Office Samples: Provide in sufficient size and quantity to clearly illustrate product.
   4. Field Samples and Mock-Ups: When specified, apply field samples and erect mock-ups as directed at Project site in location as directed by Architect. Construct each sample or mock-up complete, including work of trades required in finished work. After review, if accepted, samples and mock-ups may be used in construction of Project.

1.7 SUBMITTAL REVIEW:

A. General: Make submittals as required to cause no delay in the orderly progress of work, layout or fabrication under Contract, due allowance being made for checking by the Architect and for such corrections, resubmission and rechecking as may be necessary. Do not commence work requiring submittals until review by Architect has been completed.

B. Review: Architect's review will be for general conformance with the Contract Documents. Review does not relieve Contractor from responsibility for coordinating work of various trades and compliance with requirements of Contract Documents for lengths, fit and other details, or from furnishing materials and work required by contract which may not be indicated on submittals when reviewed. Review does not authorize changes from Contract requirements. Efforts will be made by Architect to identify errors and omissions, but General Contractor is responsible for the accuracy and correctness of submittals.
C. Color Selections: Architect will make no color selections until all submittals related to color have been received and materials reviewed.

1.8 CERTIFICATIONS:
A. General: Where specifically indicated by individual Sections, submit certification of recognized producer or association.
B. Qualifications: Under various Sections of the technical specifications, under paragraph 1.D. QUALITY ASSURANCE of those Sections, certain experience requirements and other qualifications may be required. When such requirements are specified, submit written certification of such requirements to the Architect within thirty-five (35) days of date of Notice to Proceed.
C. Products:
1. Asbestos: Submit written certification that no materials containing asbestos have been included in the Work as required in Section 01 43 00 - QUALITY ASSURANCE.
2. Volatile Organic Compounds (VOC): Provide written certification that materials used in construction operations and installed in the work comply with the requirements of the environmental protection agency having jurisdiction at the location of this Project.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

* * *

SUBMITTAL COVER SHEET

PROJECT NAME **Yolo County Ag Department Shops Building**	JOB NO. 21027 County: WA20-106-3719-AG	SECTION NO. _____	SUBMITTAL NO. _____

SUBCONTRACTOR	CONTRACTOR CERTIFICATION
NAME: ADDRESS: PHONE: CONTACT:	I hereby certify that I have reviewed the attached, and have verified field requirements and compliance with the Contract Documents. CONTRACTOR: ADDRESS: SIGNED:_____ DATE: _____

SUBMITTAL DESCRIPTION

RESUBMITTAL? NO [ ] YES [ ] OF PREVIOUS SUBMITTAL NO. _____

SUBMITTAL HISTORY

DATE REC'D. FROM CONTR.	CONSULTANT REVIEW [ ] Civil [ ] Mechanical [ ] Structural [ ] Electrical [ ] Landscape [ ] Other Date Sent: _____ Date Due: _____ Date Rec'd.: _____	DISTRIBUTION DATE _____ Copies to: Contr. _____ Insp. _____ File _____ Owner _____ Other _____

REMARKS:	**COMSTOCK JOHNSON ARCHITECTS, INC.** □ Reviewed as noted. □ Correct and resubmit as noted. By_____ Date_____

COMSTOCK JOHNSON ARCHITECTS, INC.
10520 Armstrong Avenue Mather, CA 95655 (916)362-6303

Section 01 33 90
ELECTRONIC MEDIA TRANSFER AGREEMENT

PART 1 - GENERAL

1.1 DESCRIPTION: This section provides procedures for the Contractor's use of the Architect's computer aided design (CAD) files for preparation of submittals.

1.2 SUBMISSION PROCEDURES:

A. General: Submit request for electronic data transfer by signing the Agreement included at the end of this Section and sending with an appropriate explanatory transmittal to the Architect.

B. Time: Submit request a minimum of seven (7) days prior to the date that files are needed.

1.3 ARCHITECT'S RESPONSE: Architect will email, upload, or provide files on electronic media, as requested in the transmittal. Files will be in the program used by the Architect's firm; any necessary translations will be the responsibility of the Contractor. Architect is not responsible for any problems encountered as a result of electronic transmission or translation.

1.4 DISTRIBUTION: Submit PDF of original, signed copy of the Agreement. Copy signed by Architect will be returned to the Contractor.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

* * *

ELECTRONIC MEDIA TRANSFER AGREEMENT

PROJECT NAME:	Yolo County Ag Department Shops Building Woodland, CA
ARCHITECT'S PROJECT NO.:	Job No. 21027
ARCHITECT:	Comstock Johnson Architects, Inc. 10520 Armstrong Avenue Mather, CA 95655
CONTRACTOR:	[Firm Name] _____ [Address] _____ [City, State, Zip] _____

Electronic media will remain the property of the Architect and its consultants and will be subject to their copyright. The Architect and its consultants will provide the Contractor only a working copy of the electronic media. Said working copy will have indices of the Architect's and consultants' ownership, professional name, and/or involvement in the project removed from the electronic display.

This computer aided design (CAD) working copy is provided for the convenience of the recipient only. The working copy represents data prepared as the Architect's and its consultants' internal set of working documents. As such it may be incomplete, contain deliberate or unintentional inaccuracies or be in part obsolete. In addition, intentional or unintentional changes to the working copy may occur during its use, storage, or translation by parties other than the Architect and its consultants, and the Architect and its consultants have no control over such changes that may occur. Therefore, the Architect and its consultants make no representation as to the completeness, currency or accuracy of the working copy. The Contractor is further warned that, while digital CAD data appears to be extremely accurate, this apparent accuracy is an artifact of the techniques used to generate it and is in no way intended to imply actual accuracy. The Contractor takes full responsibility for the accuracy and correctness of measurements, areas, inventories, etc. extracted from this data either manually or with the use of a computer, and for conclusions drawn from this data.

The Contractor is advised that translation of CAD data from one computer system or environment to another can and often does result in the loss of data. This loss can include but may not be limited to: portions of text and dimensions - the existence, location or scale of symbols or other elements of graphics - the internal structure of the data including layers and data attributes - the style or weight of lines. The Architect and its consultants make no representation as to the usability of this CAD data on any system.

The Contractor is advised to review all current and subsequent project documentation issued for inconsistencies and revisions. It is the responsibility of the Contractor to identify and make required revisions and corrections to the data on the working copy.

The Contractor acknowledges that the Architect and its consultants provide the working copy for information only and they do not represent that the electronic media will exactly correspond to the Contract Documents. A statement will be electronically placed on each working copy drawing sheet as follows: "Not for construction purposes. The Contract Documents as bid may contain additions, modifications, or deletions not shown on this working copy." Based in part, but not limited to, the foregoing discussion of the limitations and character of the working copy to be provided under this agreement, the Contractor specifically acknowledges that the working copy may be unreliable and/or inaccurate and/or incomplete. Contractor further acknowledges that it has and shall continue to have the sole responsibility for the accurate, complete, and timely production, completion, and submission of shop drawings and other documents prepared with the assistance of the working copy, and that the receipt of the working copy does not diminish or affect Contractor's duty with regard to said production, completion, or submission. As such, Contractor agrees that use of the working copy shall be undertaken solely at its own risk, and that the Architect and its consultants shall assume no liability whatsoever that may arise out of such use by the Contractor or any other party.

In furtherance of the above, and in consideration of the use of the working copy, Contractor agrees to release and, to the fullest extent permitted by law, defend, indemnify, and hold harmless the Owner, Architect and its partners, consultants, agent and employees from and against any and all claims, suits, actions, demands, losses, expenses, damages, penalties, and liabilities of any kind, including without limitation, attorney fees, arising out of or relating to such other use or changes to such working copy.

In addition, Contractor and Architect agree that this agreement is not a construction contract within the scope of California Civil Code section 2782.

Contractor shall ensure that any subcontractor to whom he permits access to the working copy shall be bound in writing to all the terms of this agreement.

Contractor and Architect agree that this agreement represents the total agreement between them, and incorporates all prior written and oral understandings. Contractor and Architect further agree that clauses and provisions of this contract are to be severable from one another, and in the event that one or more clauses or provisions of this contract are declared illegal or otherwise invalid by a court of competent jurisdiction, that all other clauses and provisions of the contract that remain shall be of full force and effect.

Accepted by:	Accepted by:
_____	_____
[Contractor's Representative Name]	David Helms, AIA
Date: _____	Date: _____

* * *

Section 01 34 23
DEFERRED APPROVAL SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION: Procedures for submittal of drawings, specifications, and calculations to the Architect for review and subsequent submittal to the Jurisdictional Authority for approval.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE:
- A. Submittals: Section 01 33 10 - SUBMITTALS.
- B. Backgrounds: Section 01 33 90 - ELECTRONIC MEDIA TRANSFER AGREEMENT.
- C. Related Sections:
  1. General: Specific submittal requirements are identified in the following individual Sections.
  2. Pre-engineered Structures: Refer to Section 13 34 20 - PRE-ENGINEERED METAL BUILDING.

1.3 DESIGN AND CONSTRUCTION DOCUMENTS:
- A. General: Prepare construction documents based on the schematic plans shown on the Drawings, as required to obtain Jurisdictional Authority approval. Arrangement of systems shown on schematic plans are diagrammatic and indicate minimum requirements. Where size, capacity, model, style or other pertinent information is not indicated, provide equipment, seismic bracing system, fixtures or materials of size, quality and utility which will adequately serve the building and conform to building code requirements.
- B. Drawings:
  1. General: Prepare on Architect-provided backgrounds for printing to pdfs of size required by Jurisdictional Authority.
  2. Plans: Provide construction drawings as follows; number the drawings as noted below with the appropriate letter designation for the system (F for Fire Protection; P for Plumbing; M for Mechanical; E for Electrical; T for Telecommunications; or as otherwise required by the U.S. National CAD Standard)
     - 101, 102 PLANS: Site Plan - Scale: 1"=30'-0"; Building Plans -Scale: 1/4"=1'-0".
     - 105, 106 DETAILS, EQUIPMENT SCHEDULES, DIAGRAMS, etc.: Scale as required to present a completely clear solution to the specified Design Requirements.
- C. Specifications: Incorporate all information needed to adequately describe installation. Use CSI three-part Section format and *MasterFormat* 2018 Section numbers and titles.
- D. Calculations: As required by the applicable codes, jurisdictional requirements, local ordinances and in compliance with the stated design requirements.

1.4 ARCHITECT SUBMITTAL AND REVIEW:
- A. General: Submit specified drawings, calculations and specifications to Architect for review before submittal to Jurisdictional Authority. Make submittals as required to cause no delay in the orderly progress of work, layout or fabrication under Contract, due allowance being made for Architect's review and for such corrections, resubmission and rechecking as may be necessary.
- B. Submittal Data: Submit required data identified in Section 01 33 10 - SUBMITTALS.
- C. Corrections: Upon receipt of comments of Architect's review, incorporate requested revisions and prepare Jurisdictional Authority submittal. Submit corrected documents to the Architect. Do not submit to the Jurisdictional Authority until review by the Architect has been completed.
- D. Review Period: Allow ten (10) working days for Architect's initial review and three (3) working days for Architect's subsequent review of corrections.

1.5 JURISDICTIONAL AUTHORITY SUBMITTAL:
- A. Submittal Requirements: Submit drawings, specifications, calculations, and other supporting documents required by this Section to Jurisdictional Authority. Filing fee will be paid by Owner. Make changes or corrections required by Jurisdictional Authority.
- B. Approved Documents: Forward pdf of approved drawings and specifications to Architect for distribution. Do not begin installation of systems until plans and specifications have been approved and distribution of documents has been completed.

1.6 FEES AND PERMITS: Obtain and pay for all permits and service required in installation of the specific design-build work; arrange for required inspections and secure approvals from authorities having jurisdiction.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

* * *

Section 01 35 16
ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION: This Section includes administrative and procedural requirements for alterations to existing facilities.

1.2 REQUIREMENTS INCLUDED:

A. General: Coordinate Work per Section 01 31 00 - PROJECT MANAGEMENT AND COORDINATION.

B. Demolition Work:

1. General: In addition to work as specified in Section 02 41 00 - DEMOLITION and that specifically shown; cut, move or remove items as necessary to provide access or to allow alterations and new work to proceed. Include such items as:
2. Hazardous and Unsanitary Conditions: Repair and/or removal.
3. Abandoned Items: Removal of abandoned items and items serving no useful purpose, such as abandoned piping, conduit and wiring.
4. Unusable Materials: Removal of unsuitable or extraneous materials not marked for salvage, such as abandoned furnishings and equipment, and debris such as rotted wood, rusted metals and deteriorated concrete.
5. Resurfacing: Cleaning of surfaces, and removal of surface finishes as needed to install new work and finishes.

C. Refinishing: Patch, repair and refinish existing items to remain, to the specified condition for each material, with a workmanlike transition to adjacent new items of construction.

1.3 SEQUENCE AND SCHEDULES:

A. General: Schedule Work in the sequences and within times specified in Section 01 11 00 - SUMMARY OF WORK.

B. Progress Schedule: Per Section 01 32 14 - PROGRESS SCHEDULE.

1.4 ALTERATIONS, CUTTING AND PROTECTION:

A. General: Assign work of moving, removal, cutting and patching, to trades qualified to perform the work in manner to cause least damage to each type of work, and provide means of returning surfaces to appearance of new work.

B. Cutting and Removal:

1. General: Perform cutting and patching as specified in Section 01 73 29 - CUTTING AND PATCHING. Remove minimum necessary, and in a manner to avoid damage to adjacent work.
2. Lines and Levels: Cut finish surfaces such as masonry, tile, plaster or metals, by methods to terminate surfaces in straight line at natural point of division.

C. Protection:

1. General: Protect existing finishes, equipment, and adjacent work which is scheduled to remain, from damage.
2. Weather Protection: Protect existing and new work from weather and extremes of temperature.
3. Environmental Conditions: Maintain existing interior work above 60° F.

D. Temporary Enclosure: Provide temporary enclosure as specified in Section 01 50 00 - TEMPORARY FACILITIES AND CONTROLS, to separate work areas from existing building and from areas occupied by Owner, and to provide weather protection.

PART 2 - PRODUCTS

2.1 GENERAL: Refer to Section 01 60 00 - PRODUCT REQUIREMENTS.

2.2 SALVAGED MATERIALS:

A. General: Salvage sufficient quantities of cut or removed material to replace damaged surfaces in existing construction, when material is not readily obtainable on current market. Do not incorporate salvaged or used material in new construction except with permission of Architect. Identified items not required for use in repair of existing work shall be retained for future use by the Owner.

B. Salvaged Items: As identified in Section 02 41 00 - DEMOLITION.

C. Storage: Store salvaged items in dry, secure place on site.

2.3 PRODUCTS FOR PATCHING, EXTENDING AND MATCHING:

A. General: Provide same products or types of construction as that in existing structure, as needed to patch, extend or match existing work.

B. Existing Construction: Generally, Contract Documents will not define products or standards of workmanship present in existing work; the Contractor shall identify products by inspection and testing; and workmanship by use of selected existing work as a sample for comparison.

C. Presence of Product, Finish or Type of Construction: Perform patching, extending or matching as necessary to make Work complete and consistent to identical standards of quality.

PART 3 - EXECUTION:

3.1 PERFORMANCE:

A. General: Refer to Section 01 73 10 - EXECUTION REQUIREMENTS. Patch and extend existing work using skilled mechanics who are capable of matching existing quality of workmanship. Quality of patched or extended work shall be not less than that specified for new work.

3.2 ADJUSTMENTS:

A. General: Where partitions are removed, patch floors, walls, and ceilings, with finish materials to match existing.
B. Lines and Levels: Where removal of partitions results in adjacent spaces becoming one, rework floors and ceilings to provide smooth planes without breaks, steps, or bulkheads.
C. Changes of Plane: Where extreme change of plane of two inches or more occurs, request instructions from Architect as to method of making transition.
D. Doors: Trim and refinish existing doors as necessary to clear new floors.

3.3 DAMAGED SURFACES:

A. General: Patch and replace any portion of an existing finished surface which is found to be damaged, lifted, discolored, or shows other imperfections, with matching material.
B. Substrate: Provide adequate support of substrate prior to patching finish.
C. Patched Surfaces: Refinish patched portions of painted or coated surfaces in manner to produce uniform color and texture over entire surface.
D. Refinished Surfaces: When existing surface finish cannot be matched, refinish entire surface to nearest intersections of surfaces.

3.4 TRANSITION FROM EXISTING TO NEW WORK:

A. General: When new work abuts or finishes flush with existing work, make smooth and workmanlike transition. Patched work shall match existing adjacent work in texture and appearance so that patch or transition is invisible at distance of five feet (5'-0").
B. Surface Transitions: When finished surfaces are cut in such a way that smooth transition with new work is not possible, terminate existing surface in neat manner along straight line at a natural line of division, and provide trim appropriate to finished surface.

3.5 CLEANING:

A. General: Perform periodic cleaning in accordance with the GENERAL CONDITIONS and final cleaning as specified in Section 01 77 00 - CLOSEOUT PROCEDURES.
B. Owner Occupied Areas:
    1. General: Clean daily.
    2. Spillage, Overspray, or Heavy Collection of Dust: Clean immediately.
C. Work of Trades: At completion of work of each trade, clean area and make surfaces ready for work of successive trades.
D. Final Cleaning: At completion of alterations work in each area, provide final cleaning and return space to condition suitable for use by Owner.

* * *

Section 01 42 00
REFERENCES

PART 1 - GENERAL

1.1 SUMMARY:

A. References are to various standard specifications, codes, practices, and requirements for materials, work quality, installation, inspections and tests, which are published and issued by the organizations, societies and associations listed in individual specification Sections by abbreviation and name. Obtain copies of referenced standards directly from publication sources as needed for proper performance and completion of the Work. References to established Standards mean and include the latest edition of such Standards, as of the date of issue of this Specification.

1.2 DEFINITIONS:

A. Words and Terms: The following are used in addition to those defined in the General Conditions, and are defined as follows:
   1. Accepted Equal: Reviewed and accepted by the Architect as being equal in quality, utility and appearance.
   2. Approved: As accepted by the Architect.
   3. As Required: As required by regulatory requirements, referenced standards, existing conditions, or by the Contract Documents.
   4. Directed: As instructed by the Architect in writing.
   5. Furnish: Supply and deliver to the site.
   6. Indicated: As shown, noted, or scheduled on the Drawings.
   7. Install: Anchor, fasten, or connect in place and adjust for use; place or apply in proper position and location; establish in place for use or service.
   8. Provide: Furnish and install.
   9. Site: Area to be occupied by the Project. Use of the word "jobsite" or "site" shall be interpreted to be synonymous with "site of the Work" or "Work Site".

B. Abbreviations: Definition of abbreviations and symbols used on the Drawings are identified on the Drawings. Definitions of words and abbreviations used in these Specifications are given in "The American Heritage Dictionary of the English Language".

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

* * *

Section 01 43 00
QUALITY ASSURANCE

PART 1 - GENERAL

1.1 DESCRIPTION:
- A. General: This section includes administrative and procedural requirements for quality assurance.
- B. Workmanship: Quality of work.
- C. Tolerances: Finished surfaces.
- D. Protection of Wood: Moisture and damage.

1.2 REFERENCES:
- A. General: Refer to Section 01 42 00 - REFERENCES. Products or workmanship specified in the Project Manual by association, trade, or other consensus standards shall conform to the requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Contractual Relationship: The contractual duties and responsibilities of the parties of the Contract and those of the Architect shall not be altered from the requirements of the Contract Documents by any statement or inference in any reference document.

1.3 TESTING: Refer to Section 01 45 23 - TESTING AND INSPECTION SERVICES.

PART 2 - PRODUCTS

2.1 GENERAL: Refer to Section 01 60 00 - PRODUCT REQUIREMENTS assure a consistent quality of products furnished by suppliers and manufacturers as indicated throughout the Project Manual.

PART 3 - EXECUTION

3.1 PERFORMANCE
- A. General: Refer to Section 01 73 10 - EXECUTION REQUIREMENTS.
- B. Workmanship: Perform shop and field work with mechanics, craftspersons, artisans, and workers skilled and experienced in the fabrication and installation of work specified. Install and erect work plumb, level, square, and true, or true to indicated angle, and in proper alignment and relationship to other work. Finished work shall be free from defects and damage. Quality of work shall conform to the highest established standards and practices of the various trades required. The Architect reserves the right to reject materials and work quality which does not meet accepted standards. Repair or replace substandard material or work as directed, at no additional cost to the Owner.

3.2 INSTALLATION
- A. General: Conduct quality control in concert with suppliers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Manufacturer's Instructions:
  1. General: Follow manufacturer's instructions, including each step in progression of installation. If manufacturer's instructions conflict with Contract Documents, request clarification from Architect before commencing Work.
  2. Installer: Manufacturer approved, as required in the technical sections of the Project Manual.
  3. Field Services: Coordinate with manufacturer of a product, system, or assembly which requires special knowledge and skill for proper application/installation of the product, system, or assembly to obtain field service, consultation and inspection as required for the application/installation work at no additional cost to the Owner.
- C. Reference Standards: Conform to specified standards as minimum quality for the Work except where more stringent codes or specified requirements indicate higher standards or more precise workmanship.
- D. Anchorage: Secure products in place with positive anchorage devices designed and sized to withstand stress, vibration, physical distortion, or disfigurement.
- E. Tolerances:
  1. General: Adjust products to appropriate dimensions; position before securing in place. Monitor and control tolerances of installed products to produce acceptable Work.
  2. Finished Wall Surfaces: Plumb; maximum variation of 1/8 inch in 8'-0" when a straightedge is laid on the surface in any direction, and no measurable variation in any 2'-0" direction.
  3. Finished Ceiling Surfaces: True and level; maximum variation of 1/8 inch in 8'-0" when a straightedge and water level are laid on the surface in any direction, and no measurable variation in any 2'-0" direction.
  4. Floor Surfaces: Level to within plus or minus 1/8 inch in 10'-0" for resilient floor coverings.

F. Protection of Wood:
   1. General: Provide protection of wood materials and products, whether or not installed, including erected and installed wood framing and sheathing, from water and moisture until completion and acceptance of the Project. Keep informed of weather conditions and forecasts and, when there is a likelihood of rain, protect installed and exposed framing and sheathing and stored lumber exposed to the elements with suitable water-repellent coverings, such as canvas/tarpaulins or polyethylene sheeting.
   2. Finish Materials: Keep millwork and trim, paneling, cabinets, shelving, and products manufactured from wood under cover and dry at shop until time of delivery. Do not deliver during periods of rain or heavy fog.
   3. Moisture Damage: Wood materials or products which become wet from rain, dew, fog, or other source will be considered to have moisture damage and will be rejected, requiring replacement by the Contractor with new, dry materials or products at no additional cost.

* * *

Section 01 45 23
TESTING AND INSPECTION SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION: This section includes administrative and procedural requirements for testing laboratory services for inspections, tests, and related actions, including reports prepared by Contractor, by independent agencies, and by governing authorities. Contract enforcement activities performed by Architect are not included.

1.2 TESTING LABORATORY:

A. General: Owner will employ and pay for services of an independent testing laboratory to perform specified testing. Testing laboratory shall be approved by the Architect.

B. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

C. Cooperation: Cooperate with laboratory to facilitate required services.

D. Performance of Work: Employment of laboratory shall not relieve Contractor's obligations to perform work of Contract.

1.3 REQUIREMENTS:

A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.

B. Respective Sections of the Specifications: Certification of products.

C. Listed Specification Sections: Laboratory tests required and standards for testing.

D. Testing Laboratory Inspection, Sampling and Testing is required for:

1. Concrete: Section 03 30 10 - CONCRETE.
2. Earthwork: Section 31 20 10 - EARTHWORK.

PART 2 - PRODUCTS

2.1 SUBMITTALS:

A. General: Refer to Section 01 33 10 - SUBMITTALS.

B. Testing Laboratory: Submit electronic copy (pdf) of certified written report, of each inspection, test, or similar service.

PART 3 - EXECUTION

3.1 LABORATORY DUTIES:

A. General: Comply with ASTM E329 "Standard Specification for Agencies Engaged in Construction Inspection, Testing or Special Inspection".

B. Cooperation: Cooperate with Architect, Engineer and Contractor; provide qualified personnel after due notice.

C. Services:

1. General: Perform specified inspections, sampling and testing of materials and methods of construction.
2. Specified Standards: Verify compliance.
3. Specified Materials: Ascertain compliance with requirements of Contract Documents.

D. Notification: Promptly inform Architect and Engineer of observed irregularities or deficiencies of work or products.

E. Reports: Submit as required.

F. Additional Testing: Perform additional tests as required by Architect or Owner.

3.2 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY: Laboratory is not authorized to release, revoke, alter or enlarge on requirements of Contract Documents, or perform any construction duties of Contractor.

3.3 CONTRACTOR'S RESPONSIBILITIES:

A. Cooperation:

1. Scheduling: Notify laboratory sufficiently in advance of operations, as specified under individual Sections of the specifications, to allow laboratory to schedule tests and assign personnel. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred.
2. Laboratory Personnel: Cooperate with, provide access to Work, and to manufacturer's operations.
3. Inspector: Cooperate with Inspector to secure and deliver to laboratory adequate quantities of representative samples of materials proposed for use and that require testing.

B. Manufacturer's Test Reports: Furnish copies of products test reports as required.

C. Incidental Labor and Facilities: Provide access to Work to be tested; facilitate inspections and tests.

D. Additional Testing: Paid for by Owner and backcharged to Contractor as specified in the individual sections.
E. Repair and Protection: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Refer to Section 01 73 29 - CUTTING AND PATCHING.

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Section 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION: Furnish and install temporary facilities and controls as specified, plus other unspecified temporary facilities, including labor, materials, services, utilities, and equipment, as may be required for proper performance of the contract, except as otherwise provided.

1.2 RELATED WORK SPECIFIED ELSEWHERE:
- A. Earthwork: Section 31 20 10 - EARTHWORK.
- B. Permanent Utilities: Pertinent specification Sections.

1.3 REQUIREMENTS OF REGULATORY AGENCIES:
- A. General: Temporary facilities and controls shall be approved by appropriate authorities and regulatory agencies, including insurance companies, for safety precautions, operation and fire hazard.
- B. Associated General Contractors of America (AGC): "Manual of Accident Prevention in Construction".
- C. State of California, Department of Industrial Relations (Cal/OSHA): California Code of Regulations - Title 8; Subchapter 4 - Construction Safety Orders.
- D. U.S. Department of Transportation, Federal Aviation Administration (FAA): Requirements for Drone Registration for UAS Aircraft and Operators.

1.4 PRODUCT HANDLING:
- A. Protection: Protect and maintain temporary facilities and controls in proper and safe condition throughout progress of work.
- B. Replacements: Immediately repair or replace lost or damaged temporary facilities or controls.

PART 2 - PRODUCTS

2.1 TEMPORARY UTILITIES: Provide water, electricity, gas and other specified utility services required during construction and extend service lines to construction areas; allow use by all trades.
- A. Temporary Water:
  1. General: Owner will provide and pay for water from existing source(s) on site, as shown.
  2. Temporary Connections: Provide connections to source and sufficient hose or pipe to carry water to all required locations.
- B. Temporary Electrical Facilities:
  1. General: Provide temporary electrical power and facilities necessary to supply lighting for work operations and power for power driven tools and testing.
  2. Construction Requirements:
     a. General: Construct and maintain temporary electrical facilities per requirements of the utility company providing service. Provide electrical materials, devices, and equipment that are in good and safe condition as follows:
     b. Division of Industrial Safety: "Electrical Safety Orders".
     c. Public Utilities Commission: "Rules for Overhead Line Construction".
  3. Electrical Service: Owner will provide temporary power free of charge from existing service, as shown.
  4. Interior Lighting: Provide and maintain at a minimum level of two (2) watts per square foot, as required.
- C. Temporary Heat and Ventilation:
  1. General: Provide heat and ventilation as required to protect work and materials and reduce humidity to extent required to prevent corrosion of metal, dampness or mildew that may damage materials and finishes; fuel, equipment and method of heating and ventilating shall be acceptable to Architect.
  2. Finishing: Provide heat to produce temperature of not less than 70° F for seven (7) days prior to placement of interior finish materials and throughout period of installation of gypsum board, laying of resilient flooring materials, and painting.
  3. Acceptance: Maintain building temperature of not less than 60° F after finishing is complete and until final acceptance or occupancy by Owner.
- D. Temporary Telecommunications: Provide telephone for use of the Contractor, Architect, subcontractors and suppliers. Provide and pay service charges for a cellular telephone and/or pager for use of Contractor's Superintendent. Provide internet access and e-mail capability at the job site.
- E. Temporary Fire Protection: Until fire protection is supplied by permanent facilities, install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with requirements of jurisdictional authority.

2.2 FIELD OFFICE: Provide acceptable temporary office, weathertight, well lit and ventilated; equip with shelves, desks, filing cabinet, chairs, and such other items of equipment needed, with adequate provisions for power, heating and cooling.

2.3 SANITARY FACILITIES: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.

2.4 CONSTRUCTION EQUIPMENT:

A. General: Erect, equip, operate, and maintain construction equipment per applicable statutes, laws, ordinances, rules, and regulations of jurisdictional authorities and insurance companies regarding safety, operation and fire hazard.

B. Construction Access Equipment:

1. General: Provide and maintain scaffolding, staging, runways, and similar equipment, as required. Coordinate furnishing and use with subcontractors.
2. Vertical Transportation: Provide and maintain hoists per Safety Orders of State of California, Division of Industrial Safety, until work is completed or until no longer required under this Contract.

2.5 ENCLOSURES, FENCING AND BARRICADES:

A. General: Provide and maintain barricades, fencing, shoring, pedestrian walkways including lights and other safety precautions to guard against personal injury and property damage as prescribed by jurisdictional authorities, including insurance companies.

B. Safety Orders: Obtain copies and conduct work under the requirements of applicable Safety Orders issued by State of California, Division of Industrial Safety. Inform subcontractors and material suppliers as to the requirements of applicable Safety Orders.

2.6 TEMPORARY SIGNS:

A. Project Sign: Not required.

B. Other Signs: Not permitted; Contractor's name may be placed on field office and equipment.

2.7 SITE CONTROLS AND PARKING:

A. Vehicular Access and Parking: Use identified entrances, access roads, and parking, as shown, or as directed. Maintain roads in satisfactory condition during Contract; repair damage resulting from work of this Project, as required, to leave in condition equal to that existing at start of Work.

B. Site Storage and Work Areas: On-site storage and work areas will be identified by the Architect, for the Contractor's use, subject to change as necessary as job progresses. Enclose with fences and gates as required for security.

C. Regulations: Observe and comply with rules and regulations in effect at occupied facilities, including parking and traffic regulations, security restrictions, hours of access, and the like.

D. Use of Public Sidewalks and Streets: Make arrangements with civic authorities for temporary use of streets and sidewalks for offices, shops, storage, etc.; abide by rules, regulations and ordinances; obtain and pay fees for permits.

E. Debris Control: Keep work and storage areas clean and free of debris. Dispose of debris off site as it accumulates; pay required fees for use of dumps. Burning or burying on site is prohibited.

F. Dust Controls:

1. Indoor Operations: Control dust by using temporary partitions, curtains, or other means to prevent its spread beyond immediate work area. Use temporary means of closure for ducts and other openings communicating with other parts of building.
2. Outdoor Operations: Use sprayed water to control dust from outdoor operations, as required.

G. Noise Control: Minimize noise caused by work operations. To extent possible, schedule accomplishment of noisy construction operations to hours during which adjacent building occupants will be least inconvenienced.

H. Dewatering Facilities: Provide and maintain pumping facilities to keep site reasonably dry; protect materials and installed work from water damage until dewatering is no longer required.

I. Security: Contractor is responsible for security of areas of Work during entire time of Contract. Repair damage to Work and replace materials lost due to vandalism or theft.

J. Drainage: As required by the State of California Water Resources Control Board, only rainwater is permitted in storm drain system. Do not permit water resulting from washing of equipment or other construction activities to be discharged into the storm drainage system. Provide temporary containment, sediment traps, and/or gravel filters to prevent discharge of non-storm water into storm drain system.

PART 3 - EXECUTION

3.1 MAINTENANCE AND REMOVAL: Maintain temporary facilities and controls as long as required for safe and proper completion of Work; remove temporary facilities and controls as rapidly as progress of Work will permit.

* * *

Section 01 60 00
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION:
- A. General: This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- B. Submittals: Product lists.
- C. Quality Assurance: References, source limitations, compatibility of options and nameplates.
- D. Product Options: Products specified by reference standards, specified products, alternate manufacturers, accepted equals, and required products.
- E. Product Handling: Procedures.

1.2 RELATED WORK:
- A. General: The following items of Work are related to the Work of this Section but specified elsewhere in this Project Manual.
- B. Closeout: Refer to Section 01 77 00 - CLOSEOUT PROCEDURES.

1.3 DEFINITIONS:
- A. Products:
  1. General: Items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  2. Named Products: Items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
- B. Materials: Components shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
- C. Equipment: Product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.4 SUBMITTALS:
- A. General: Refer to Section 01 33 10 - SUBMITTALS.
- B. Products List: Within thirty-five (35) days after award of contract, submit complete list of products intended for use on this Project. Provide list tabulated by Section Number, giving the trade name, name of the manufacturer, and model number or catalog designation of each product. Include products specified by reference standards and alternate products proposed for substitution.

1.5 QUALITY ASSURANCE:
- A. General: Refer to Section 01 43 00 - QUALITY ASSURANCE.
- B. Reference Standards: Refer to Section 01 42 00 - REFERENCES.
- C. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
- D. Compatibility of Options: When the Contractor is given the option of selecting between two (2) or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- E. Nameplates:
  1. General: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
  2. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
  3. Equipment: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces.

PART 2 - PRODUCTS

2.1 GENERAL: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.

2.2 PRODUCT OPTIONS:
- A. General: For purposes of this Project, and in satisfaction of the requirements of the California Public Contract Code, products have been specified with the following options:
- B. Products Specified by Reference Standards: Contractor may select any product which meets the standards, by any manufacturer.
- C. Specified Products and Alternate Manufacturers: Wherever catalog numbers and specific brand or trade names are used in conjunction with a designated material, product, thing or service mentioned in these specifications, they are used to establish the standards of quality, utility and appearance required. The "specified product" shall be understood to be the basis for the project design. Comparable products of named "alternate manufacturers" shall be considered equal in

quality, utility and appearance. Contractor has the option of selecting from products and manufacturers named and must satisfy submittal requirements specified in Section 01 33 10 - SUBMITTALS.

D. Accepted Equal: Where specification includes the designation "or accepted equal", Contractor may request acceptance as "equal" any material, process, or product of unnamed manufacturer through use of the Substitution Request specified in Section 01 25 00 - SUBSTITUTION PROCEDURES. Requirements of that Section must be satisfied. Acceptance as "equal" will be the decision of the Architect; if the material, process or product is not, in the opinion of the Architect, equal in quality, utility and appearance to that specified, Contractor must furnish material, process or product specified.

E. Required Products: Where use of one named product and manufacturer is required to match others in use or because only one brand or trade name is known, there is no option, and no substitution will be allowed.

PART 3 - EXECUTION

3.1 GENERAL: Refer to Section 01 73 10 - EXECUTION REQUIREMENTS.

3.2 PRODUCT HANDLING: Assure that Work is manufactured and/or fabricated in ample time so as to not delay construction progress. Transport, handle, store and protect products in accordance with manufacturer’s instructions.

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Section 01 73 10
EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION: This Section includes administrative and procedural requirements governing the Contractor's installation of products specified for use in the Project.

1.2 SUBMITTALS:
- A. Closeout: Refer to Section 01 77 00 - CLOSEOUT PROCEDURES.

1.3 QUALITY ASSURANCE:
- A. General: Refer to Section 01 43 00 - QUALITY ASSURANCE.
- B. Reference Standards: Refer to Section 01 42 00 - REFERENCES.
- C. Qualifications: Use installers specialized in the work required, as specified in the individual sections of the Project Manual.

PART 2 - PRODUCTS

2.1 GENERAL: Refer to Section 01 60 00 - PRODUCT REQUIREMENTS.

2.2 PRODUCT HANDLING:
- A. Delivery: Schedule delivery of materials to the site at such time as required for proper coordination of the work. Receive materials in manufacturer's unopened packages and bearing manufacturer's label.
- B. Storage: Store materials in a dry and well-ventilated place, adequately protected from damage and exposure to the elements.

PART 3 - EXECUTION

3.1 PREPARATION:
- A. Examination of Conditions: Carefully examine sub-surfaces before beginning work; report to Architect any defects. Starting of work implies acceptance of conditions as they exist.
- B. Examination: Examine conditions of work in place before beginning work; report defects.
- C. Measurements:
  1. General: Take field measurements; report discrepancies between plan and field dimensions to Architect.
  2. Templates: Obtain templates, patterns, and setting instructions as required; verify dimensions.
- D. Protection: Provide temporary protection and enclosures for floor and roof openings, stairways, and similar conditions. Provide adequate temporary centering, bracing, and shoring for protection of structure during construction. Protect non-ferrous metal work throughout construction period; protect materials from damage during adjacent construction activities.

3.2 INSTALLATION:
- A. General: Install products in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Embedded Items: Coordinate delivery and placement of items embedded in work.
- C. Operating Equipment: Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate Work of various contractors having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Mechanical and Electrical:
  1. General: Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
  2. Pipes, Ducts, Conduit, Fixtures and Outlets: In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Completion:
  1. General: Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest. Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion. Comply with manufacturer's written instructions for temperature and relative humidity.
  2. Correction of Defective Work: After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

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Section 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 DESCRIPTION: Provide all cutting, fitting and patching, including excavation and backfill as required per Section 31 20 10 - EARTHWORK, to complete the Work and to accomplish the applicable listed items.

1.2 LISTED ITEMS:

A. Fitting: Make its several parts fit together properly.

B. Untimely Work: Uncover portions of the Work to provide for installation of work not installed in the proper sequence of construction.

C. Defective Work: Remove and replace defective and non-conforming work.

D. Samples For Testing: Remove samples of installed work for testing per Section 01 45 23 - TESTING AND INSPECTION SERVICES and as identified in individual sections of the specifications.

E. Mechanical and Electrical Penetrations: Provide penetrations of non-structural surfaces for installation of piping and conduit; refer to MECHANICAL and ELECTRICAL specifications.

F. Existing Construction: Install specified work in existing Construction.

1.3 SUBMITTALS:

A. Cutting and/or Alteration Request:

1. General: Submit written request to the Architect in advance of executing any cutting or alteration to affected items as listed below.
2. Affected Items: Work process of the Owner or any separate contractor; structural value or integrity of any element of the Project; integrity or effectiveness of weather-exposed or moisture-resistant elements or systems; efficiency, life, maintenance or safety of operational elements; visual qualities of sight-exposed elements.
3. Request Requirements: Project name and location; description of all affected work; explanation of necessity for cutting, alteration or excavation; impact on the work of the Owner or any separate contractor, or on the structural or weatherproof integrity of the building; description of proposed work, including scope of cutting, patching, alteration, or excavation, products proposed to be used, trades who will complete the work, and extent of refinishing to be done; alternatives to cutting and patching; cost proposal, when applicable; written permission from any separate contractor whose work will be affected.
4. Product Substitutions: Should conditions of Work or schedule indicate change of products from original installation, submit request for substitution as specified in Section 01 25 00 - SUBSTITUTION PROCEDURES.
5. Field Observation: Submit written notice to Architect designating date and time work will be uncovered.

PART 2 - PRODUCTS

2.1 MATERIALS: Comply with requirements of individual sections of these Specifications for replacement of Work removed and type of work to be done.

PART 3 - EXECUTION

3.1 INSPECTION:

A. General: Inspect existing conditions; include elements subject to damage or movement during cutting and patching.

B. After Uncovering Work: Inspect conditions affecting the installation of products, or performance of Work.

C. Unsatisfactory Conditions: Report unsatisfactory or questionable conditions to the Architect in writing; do not proceed with work until Architect has provided further instructions.

3.2 PREPARATION:

A. Temporary Support: Provide as necessary to assure structural value or integrity of affected portion of Work.

B. Protection:

1. General: Provide devices and methods to protect other portions of the Project from damage.
2. Environmental Protection: Provide protection from elements for that portion of the Project which may be exposed by cutting and patching, and maintain excavations free from water.

3.3 PERFORMANCE:

A. Demolition: Execute cutting and demolition per Section 02 41 00 - DEMOLITION; prevent damage to other work; provide proper surfaces to receive installation of repairs.

B. Excavation and Backfill: Execute excavating and backfilling by methods which will prevent settlement or damage to other work per Section 31 20 10 - EARTHWORK.

C. Cutting and Patching: Perform work with workers skilled in the trades involved. Make patches, seams and joints durable and inconspicuous.

D. Adjustment: Execute fitting and adjustment of products to provide a finished installation complying with specified products, functions, tolerances and finishes.
E. Fitting: Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
F. Restoration: Restore work which has been cut or removed; install new products to provide completed Work as shown and specified.
G. Refinishing: Refinish entire surfaces as necessary to provide even finish to match adjacent finishes; refinish continuous surfaces to nearest intersection; entire unit of any assembly.

* * *

Section 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 DESCRIPTION: Provide Construction Waste Management including salvaging, recycling, and disposing of nonhazardous construction waste, as shown and specified per Contract Documents.

PART 2 - PRODUCTS

2.1 WASTE MANAGEMENT PLAN: Develop plan, consisting of waste identification and construction methods employed to reduce the amount of waste generated, to re-use and recycle minimum 65% of construction waste materials generated by the Work. Indicate quantities by weight or volume; use same units of measure throughout waste management plan.

2.2 QUALITY REQUIREMENTS: Refer to Section 01 42 00 - REFERENCES for reference standards, applicable codes and definitions, and to the following:

A. American National Standards Institute (ANSI): ANSI 10.2 - Safety Code for Building Construction.
B. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers standard specifications.
C. California Building Code (CBC): 2013 California Green Building Standards Code (CALGreen): Title 24, Part 11.
D. California Department of Resources Recycling and Recovery (CalRecycle):
   1. General: Sustainable Building Guidelines.
   2. Recycling and Recovery: Construction and Demolition Debris Recycling guidelines.
E. California Occupational Safety and Health Administration (CalOSHA): Construction Safety Orders; 29 CFR, PART 1926 Safety and Health Regulations for Construction.
F. Construction & Demolition Recycling Association (CDRA): Standards and guidelines.
G. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
H. Qualifications:
   1. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
   2. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

PART 3 - EXECUTION

3.1 PREPARATION: Review Waste Management Plan procedures and identify locations established for salvage, recycling, and disposal. Designate and label specific areas on the site for separating materials to be salvaged, recycled, reused, donated, and sold.

3.2 IMPLEMENTATION:

A. Recycled Materials: Separate recyclable waste from other waste materials, trash, and debris. Provide properly marked containers or bins for controlling recyclable waste until they are removed from Project site. Store materials away from construction area, off the ground and protect from the weather; do not store within drip line of remaining trees. Transport recyclable waste off Owner's property to recycling receiver or processor.
B. Disposal: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on-site. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. Burning and burying of materials is not allowed. Transport waste materials off Owner's property and legally dispose of them.

* * *

Section 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION: Perform operations necessary for and incidental to closing out the Contract and assisting in obtaining Project acceptance by the Owner.

1.2 FINAL CLEANING:

A. General: Remove marks, stains, fingerprints, dust, dirt, and paint drippings resulting from work of this Project. Wash tile, plumbing and other fixtures clean; polish hardware and other unpainted metals. Remove temporary labels, tags and paper covering.

B. Finish Surfaces: Perform specified cleaning, polishing, sealing, waxing, and other finish operations required for acceptance of work by the Owner.

C. Glass: Employ professional window cleaners to clean glass, mirrors and plastic surfaces of putty, paint materials, stains and dirt, as specified. Leave work bright, clean and polished.

1.3 CLOSEOUT SCHEDULE AND PROCEDURE:

A. Requirements Preparatory to Project Acceptance:

1. Certifications: Deliver to Architect separate written certifications as required in Section 01 33 10 - SUBMITTALS stating that no materials containing asbestos has been installed in the Work, and that materials used in construction operations and installed in the Work comply with the volatile organic compound (VOC) requirements.
2. Temporary Facilities: Remove from site per Section 01 50 00 - TEMPORARY FACILITIES AND CONTROLS.
3. Cleaning: Complete thorough building and site cleaning per Document 00 70 00 - GENERAL CONDITIONS, Article 1.B of this Section, and the individual sections of the specifications.
4. Adjustments:
   a. General: As required in the various technical sections of this Project Manual.
   b. Plumbing and Mechanical Equipment: Assure that equipment operates quietly and free from vibration. Properly adjust, repair, balance, or replace equipment producing objectionable noise or vibration in occupied areas of building; provide additional brackets, bracing, etc., to prevent such objectionable noise or vibration.
   c. Systems: Assure that all operate without humming, surging, or rapid cycling; balance reports are required before Mechanical Engineers will prepare "punch lists".
5. Extra Stock: Deliver one (1) percent or a minimum of one full container of each kind and type of interior or unit finish material installed, unless otherwise specified. Package materials with protective covering and identify with labels describing contents.
6. Affidavits: Submit affidavits of release of liens, payment of debts and claims and all applicable taxes.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS:

A. General: Record drawings shall be kept up-to-date at all times. Verify that record drawings accurately show work completed to date before approval of pay requests.

B. Drawings:

1. General: Architect will furnish required documents in reproducible medium to the Contractor.
2. Locations: At time of installation, record installed locations of plumbing and electrical work.
3. Documentation:
   a. General: Transfer installed locations to reproducible medium and submit documents to Architect.
   b. Identification of Changes: Information entered on reproducible documents shall be neat, legible and emphasized by drawing "clouds" around changed items.
   c. Dimensions: Locate work, including stubs for future connections, with reference to permanent landmarks or buildings and indicate depth below finish grade.
   d. Symbols and Designations: Use same as shown on Contract Drawings.

C. Certification: Completed Record Drawings shall be signed by Contractor as complete and accurate records of the Project, as built.

2.2 OPERATION AND MAINTENANCE INSTRUCTIONS:

A. General: Incorporate in Maintenance/Operating Manual(s), as specified below, brochures, manufacturer's catalogs and written instructions for equipment and materials needing regular care or maintenance; i.e., carpets, resilient flooring, architectural finishes, mechanical and electrical equipment, etc. Provide one (1) complete copy of each manual required and electronic copy (PDF) of contents.

B. Manual:

1. General: Prepare manuals using durable plastic loose leaf binders approximately 8-1/2 x 11 inches in size with following minimum data:
2. Identification: On, or readable through, a front cover stating general nature of manual.

3. Index: Neatly typewritten at front of manual; **clearly identify location of emergency data**.
4. Operation and Maintenance Data: Complete instructions for products and equipment required.
5. Repair/Replacement Parts: Provide name and address of nearest vendor for replacement of parts or repair services.
6. Additional Data: Where contents of manuals include manufacturer's catalog pages, clearly indicate precise items included in this installation and delete, or otherwise clearly indicate, manufacturer's data which is not in this installation.

C. Operating Instructions: Mount and post instructions for equipment, as required.
D. Service and Maintenance Contracts: As specified, executed by each subcontractor, manufacturer, and supplier as applicable.

2.3 GUARANTEES:
A. General: Provide in conformance with the requirements of the GENERAL CONDITIONS and as required in the individual sections of this Project Manual.
B. Guarantee Period: Duration of the guarantees shall be as stated in the individual sections of this Project Manual. Guarantee periods shall commence on the official date of acceptance by the Owner of the Project.
C. Submittal: Submit required Guarantees on electronic copies (PDFs) of Guarantee Form included at the end of this Section and deliver in a complete package to the Architect. Required Guarantee Forms must be reviewed and accepted by the Architect prior to final acceptance by Owner.

PART 3 - EXECUTION

3.1 PROJECT ACCEPTANCE:
A. General: Notify Architect when Contractor considers the Project complete enough to prepare a punch list. Architect will then notify Mechanical and Electrical Engineers to make inspections and prepare their punch lists, which must be completed before Architect will conduct his inspection to determine if project is substantially complete in accordance with the GENERAL CONDITIONS.
B. Notification: After requirements preparatory to project acceptance have been completed, Contractor shall notify Architect in writing that the Work is ready for final inspection; provide minimum three (3) days' advance notice of desired date for inspection.
C. Final Inspection: Contractor, or his agent authorized to act in his behalf, shall accompany the Architect on the final inspection, as well as any principal subcontractors requested by the Architect.

3.2 REQUEST FOR PAYMENT: Upon acceptance of Project by the Owner, the Contractor shall submit his request for final payment, less retention. Retention payment will not be made by the Owner until 35 days after filing of Notice of Completion.

* * *

GUARANTEE FORM

Guarantee for _____

We hereby guarantee that the workmanship and materials that we installed in the Yolo County Ag Department Shops Building have been in accordance with the Drawings and Project Manual and that the work as installed will fulfill the requirements of the guarantee included in the Project Manual. We agree to repair or replace any or all work, together with any other adjacent work that we may displace in so doing, that may prove to be defective in its workmanship or material within a period of _____ (____) years from date of acceptance by the Owner, without any expense whatsoever to Owner, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above-mentioned conditions within ten (10) days after being notified in writing by the Architect or Owner, we collectively or separately do hereby authorize Owner to proceed to have said defects repaired and made good at our expense and we will honor and pay the costs and charges therefor upon demand.

SUBCONTRACTOR:

_____

Signed Date

_____

Name Title

_____

Company Name License No.

_____

Address

GENERAL CONTRACTOR:

_____

Countersigned Date

_____

Name Title

_____

Company Name License No.

_____

Address

* * *

Division 02 - EXISTING CONDITIONS

Section 02 41 00
DEMOLITION

PART 1 - GENERAL
1.1 SUMMARY:
A. General: Provide Demolition, as shown and specified per Contract Documents.
B. Retained Items: Carefully remove items to remain property of Owner and be reinstalled in the work.
1.2 REFERENCES:
A. American National Standards Institute (ANSI): ANSI 10.2 - Safety Code for Building Construction.
B. American Society of Safety Engineers (ASSE): ANSI/ASSE A10.6 - Safety Requirements for Demolition Operations - American National Standard for Construction and Demolition Operations.
C. California Occupational Safety and Health Administration (CalOSHA): Title 8 - Construction Safety Orders.
D. Concrete Sawing and Drilling Association (CSDA): Standards and Specifications.
E. National Fire Protection Association (NFPA): NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
F. Occupational Safety and Health Administration (OSHA): Standards.
1.3 SUBMITTALS:
A. Schedule of Demolition Activities: Submit a detailed sequence of demolition and removal work, including dates for shutoff, capping, and continuance of utility services. Arrange schedule to not interfere with other building Owner's on-site operations.
B. Procedures: Submit written procedures documenting the proposed methods to be used to control dust and noise.
C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.
D. Landfill Records: Submit receipt Indicating acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
E. Project Record Documents:
1. General: Submit under provisions of Section 01 77 00 - CLOSEOUT PROCEDURES.
2. Capped Utilities And Subsurface Obstructions: Accurately record actual locations.]

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
3.1 PREPARATION:
A. General: Refer to Section 01 74 19 - CONSTRUCTION WASTE MANAGEMENT.
B. Scheduling:
1. General: Coordinate and schedule demolition work as required by the Owner and as necessary to facilitate construction progress. Conduct demolition to minimize interference with adjacent and occupied building areas.
2. Existing Utilities:
a. General: Coordinate disconnection and capping of existing gas, water, sewer, electrical, telephone, cable and security system utilities; verify work is complete before starting demolition work affecting these utilities. Do not interrupt existing utility service to operating facilities, except when authorized in writing by the building Owner. Provide not less than 72 hours' notice to Owner if shutdown of service is required. Make provision for temporary service during interruption of existing utility service, acceptable to Owner.
b. Plumbing: Refer to Division 22 - PLUMBING; disconnecting, removing and capping existing gas, water, and sewer utilities.
c. Electrical: Refer to Division 26 - ELECTRICAL; disconnecting, removing, and capping existing electrical utilities. Owner will make arrangements with telephone company concerning their equipment and lines.
C. Examination:
1. General: Examine conditions of work in place before beginning work; report existence of hazardous materials or unsafe structural conditions.
2. Hazardous Materials:
a. General: Identify chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations, and notify such jurisdictional

agencies as may be required. Collect and legally dispose of such materials at official disposal locations away from the site.

b. Asbestos: Refer to Section 00 31 26 - EXISTING HAZARDOUS MATERIALS INFORMATION and Section 02 50 00 - SITE REMEDIATION.

D. Measurements: Take field measurements; report variance between plan and field dimensions.

E. Protection:

1. General: Refer to Division 01 - GENERAL REQUIREMENTS.
2. Site: Protect existing adjacent installations not scheduled for demolition from damage; take measures to prevent damage to existing turf, trees, streets, curbs, walks, piping, sewers, etc., during demolition and construction.
3. Safety Precautions: Prevent damage to existing elements identified to remain or to be salvaged, and prevent injury to the public and workmen engaged on site. Demolish building elements in such manner that demolished materials fall within foundation lines of building. Do not allow demolition debris to accumulate on site. Pull down hazardous work at end of each day; do not leave standing or hanging overnight, or over weekends.
4. Benchmarks: Locate, identify and protect existing benchmarks. Accurately replace any benchmarks damaged or destroyed during demolition.
5. Dust: Contain and control dust produced by operations as required by jurisdictional agencies.
6. Selective Demolition:
   a. General: Prevent movement of structure; provide required bracing and shoring.
   b. Watertight Barriers: Provide and maintain as required to prevent water intrusion and damage.
   c. Egress: Do not close or obstruct route to and from required exits, or the required width of exit path.

3.2 DEMOLITION:

A. General: Perform demolition as shown and remove from the site. Use methods required to complete Work within limitations of governing regulations.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

C. Surface Preparation: Prepare surfaces to remain for application of subsequent materials as specified in Section 01 73 29 - CUTTING AND PATCHING.

D. Utilities: Disconnect, remove, cap and identify designated utilities within demolition areas.

E. Selective Demolition:

1. General: Protect existing supporting structural members and materials.
2. Cutting and Removal: Remove existing work as shown; cut in neat straight lines, parallel to adjacent elements or plumb to vertical surfaces; grind smooth saw cut edges of concrete slabs or walks. Neatly remove existing finish materials back to clean straight line on nearest support to facilitate installation of new materials, patches or repairs. Use methods that prevent damage to other work, and provide proper surfaces for installation of repairs and new work. Upon completion of work, leave areas in clean condition.

F. Salvaged Items:

1. Items Removed and Retained by Owner: Appliances, equipment and portable furniture to be retained by the Owner, will be identified, removed and stored by the Owner before the beginning of demolition operations.

G. Disposal:

1. General: Demolished materials become property of the Contractor and shall be removed from premises, except those items specifically listed to be retained by Owner.
2. Burning and Burying of Materials: NOT ALLOWED.
3. Haul Routes:
   a. General: Obtain permits as required by jurisdictional agencies. Establish haul routes in advance; post flagmen for the safety of the public and workmen.
   b. Maintenance: Keep streets free of mud, rubbish, etc.; assume responsibility for damage resulting from hauling operations; hold Owner free of liability in connection therewith.

* * *

Division 03 - CONCRETE

Section 03 30 10
CONCRETE

PART 1 - GENERAL

1.1 SUMMARY:
- A. General: Provide Concrete, as shown and specified per Contract Documents.
- B. Formwork: Vapor barrier, forms, ties, spreaders and release agents.
- C. Reinforcement: Bars and welded wire fabric.
- D. Concrete: Mix, admixtures and surface treatments.

1.2 REFERENCES:
- A. American Concrete Institute (ACI):
  1. ACI 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
  2. ACI 211.2: Recommended Practice for Selecting Proportions for Normal Weight Concrete.
  3. ACI 301: Specifications for Structural Concrete.
  4. ACI 302.1R: Guide for Concrete Floor and Slab Construction.
  5. ACI 303R: Guide to Cast-in-Place Architectural Concrete Practice.
  6. ACI 304R: Guide for Measuring, Mixing, Transporting and Placing Concrete.
  7. ACI 304.2R: Placing Concrete by Pumping Methods.
  8. ACI 305R: Guide to Hot Weather Concreting.
  9. ACI 306R: Guide to Cold Weather Concreting.
  10. ACI 308R: Guide to Curing Concrete.
  11. ACI 318: Building Code Requirements for Structural Concrete and Commentary; latest edition.
  12. ACI 347: Guide to Formwork for Concrete.
  13. ACI SP-15: Field Reference Manual.
  14. ACI SP-66: Detailing Manual.
- B. American Society for Testing and Materials (ASTM):
  1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers standard specifications.
  2. ASTM C39: Standard Test Methods for Compressive Strength of Cylindrical Concrete Specimens.
  3. ASTM C94: Standard Specifications for Ready-Mixed Concrete.
  4. ASTM E329: Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
- C. American Welding Society (AWS): AWS D1.4 - Structural Welding Code Reinforcing Steel.
- D. Concrete Reinforcing Steel Institute (CRSI):
  1. General: Concrete Reinforcing Steel Institute Manual of Standard Practice.
  2. CRSI 63: Recommended Practice For Placing Reinforcing Bars.
  3. CRSI 65: Recommended Practice For Placing Bar Supports, Specifications and Nomenclature.
- E. National Institute of Standards and Technology (NIST):
  1. NIST PS 1: Construction and Industrial Plywood.
  2. NIST PS-20: American Softwood Lumber Standard.
- F. National Ready-Mixed Concrete Association (NRMCA): Check List for Certification of Ready Mixed Concrete Production Facilities.

1.3 SUBMITTALS:
- A. General: Submit product data, samples of concrete finishes, and test reports per Chapter 17A of CBC.
- B. Shop Drawings:
  1. Submit manufacture and installation details per ACI, including fastenings, for review.
  2. Reinforcing: Indicate bar sizes, spacings, locations and quantities of reinforcing steel and wire fabric, bending and cutting schedules, including supporting and spacing devices and fastenings. Include special reinforcement required for openings through concrete structures.
  3. Design Mixes: Submit concrete mix designs for review; include alternate mix designs required for characteristics of materials, project conditions, weather, test results, or other circumstances that warrant adjustments.

4. Shoring: Submit proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.

C. Placement Records: Keep on job site until completion, and open to inspection, record showing time and date and accurate location of placement of concrete in the structure.

D. Certificates:
1. General: Submit certification stating that products used to manufacture concrete delivered to the site meet or exceed the material and testing requirements of these specifications.
2. Reinforcement: Submit mill test and chemical analysis certificates for all reinforcing steel delivered to the site.

1.4 QUALITY ASSURANCE:

A. Pre-construction Conference Conduct conference at Project site with representatives of each entity directly concerned with cast-in-place concrete, including Contractor's superintendent, testing agency representative, ready-mix concrete producer and concrete subcontractor. Review concrete mix designs and examine procedures for ensuring quality of concrete materials.

B. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

C. Testing: Tests by Testing Laboratory appointed by Owner and under directions of Architect; expense of testing borne by Owner; make tests per Chapter 17A of CBC.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Refer to General Notes and specifications as shown on the drawings

B. Formwork:
1. Forms:
a. Wood:
1. Lumber: NIST PS-20 Construction grade douglas fir.
2. Plywood: NIST PS 1, C Grade douglas fir, 5/8 inch minimum; sound undamaged sheets with clean true edges.
b. Chamfer Strips: Wood, metal, PVC, or rubber strips; 3/4 inch by 3/4 inch minimum, unless otherwise shown.
2. Fasteners: As required to maintain formwork in place while placing and curing concrete; non-staining.
3. Form Ties: Factory-fabricated, non-staining, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
4. Spreaders: Metal; wood not permitted.
5. Form Release Agent: Colorless mineral oil which will not stain the concrete or impair natural bonding characteristics of coating intended for use on concrete.
6. Vapor Barrier:
a. General: Moistop Ultra 6manufactured by the Henry Company.
b. Alternate Manufacturers: Comparable products manufactured by Stego Industries, LLC, or accepted equal.
c. Joint Tape: As recommended by manufacturer.
7. Expansion Joint Filler Strip Material: ASTM D1751, asphalt-saturated cellulosic fiber, or ASTM D1752, cork or self-expanding cork; preformed, ½ inch thick, unless otherwise shown.

C. Reinforcement:
1. Bars:
a. General: ASTM A615, deformed; No. 3 and smaller Grade 40; No. 5 and larger Grade 60, or ASTM A706 where shown.
b. Stirrups: Same grade as for reinforcement bars.
c. Dowels: Same grade as bars to which dowels are connected.
2. Welded Wire Fabric: ASTM A1064, Plain type as shown in flat sheets, unless otherwise noted.
3. Chairs, Bolsters, Bar Supports, Spacers:
a. General: CRSI Class 2; sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor barrier puncture. Do not use wood, brick or galvanized materials.
b. Special Units Adjacent to Weather Exposed Concrete Surfaces: CRSI Class 1; plastic coated steel type; size and shape as required.
c. Support is No Closer to Concrete Surface Than ½ Inch: CRSI Class 3 wire.

d. Supports Placed Against Ground: Precast concrete blocks not less than 4 inches square with embedded wire.
4. Tie Wire: ASTM A82, as drawn.

D. Anchor Bolts: ASTM F1554 or ASTM A307; rolled body bolts with upset threads not permitted.
E. Concrete:
1. Cement: ASTM C150, Type I or II.
2. Aggregates: ASTM C33, uniformly graded.
3. Water: ASTM C94, potable; clean and free from deleterious amounts of acids, alkalis, scale, or organic materials.
4. Admixtures: As noted or shown on the drawings; manufacturer-certified to contain not more than 0.1 percent water-soluble chloride ions by mass; compatible with other admixtures and cementitious materials. Admixtures containing calcium chloride or thiocyanates not allowed.
5. Surface Treatments:
a. General: As noted or shown on the drawings.
b. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent brown aluminum oxide and not less than 25 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.
c. Membrane Curing Compound: ASTM C309, Type 1D clear (with fugitive dye), guaranteed not to affect bond of subsequent finish materials. Curing compound and areas to receive it must be accepted by Architect before application.
d. Sealer:
1. General: Clear Seal manufactured by Euclid Chemical Co.
2. Alternate Manufacturers: Comparable products manufactured by BASF Building Systems, or accepted equal.
6. Related Materials:
a. Non-Shrink, Non-metallic Grout:
1. General: MasterFlow 928 manufactured by BASF Building Systems.
2. Alternate Manufacturers: Comparable products manufactured by Euclid Chemical Co., or accepted equal.
b. Bonding Agent for Patching:
1. General: “Flex-Con” manufactured by Euclid Chemical Co.
2. Alternate Manufacturers: Comparable products manufactured by BASF Building Systems, or accepted equal.

2.2 REINFORCEMENT FABRICATION:
A. General: Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice." Where specific details are not shown, fabricate per ACI SP-66: Detailing Manual.
B. Welding: Per AWS D1.4.

2.3 MIXES:
A. Concrete Proportions:
1. General: Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases.
2. Normal-weight: Per ACI 211.1 and ACI 301.
B. Concrete Design: As noted or shown on the drawings.
C. Mixing of Concrete:
1. General: All concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogeneous; mixer must be discharged completely before the mixer is recharged. Conform to requirements of CBC Section 1905.
2. Ready-Mix Concrete: Mix and deliver in accordance with the requirements set forth in CBC Chapter 19. Furnish batch ticket information.
3. Admixtures: Verify compatibility of concrete admixtures when multiple admixtures are called for in a specific mix.
4. Job Mixed Concrete:
a. General: Use batch mixer of approved type, with capacity to handle one or more full sack batches, no split sack batches permitted; furnish batch ticket information. Operate mixer as recommended by manufacturer. Record approximate location of final deposit in structure.
b. Mixer Capacity of 1 Cubic Yard or less: Mix minimum one and one half (1-1/2) minutes after all materials are in drum.

c. Mixer Capacity of 1 Cubic Yard or More: Increase mixing time by 15 seconds for each additional 1 cubic yard, after all materials are in drum.
d. Handling and Mixing of Concrete: Architect may order removal of any equipment which in his opinion is insufficient or in any way unsuitable.

D. Grout: Provide mortar containing same proportions of cement and sand as used for concrete, with ultimate compressive strength of 3000 psi.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Scheduling:
1. Formwork: Coordinate placement of work specified under other Sections in forming and placing openings, or embedded items placed within formwork.
2. Placement: Notify Architect and Structural Engineer at least 48 hours prior to placing of concrete.

B. Environmental Requirements: Per ACI 305R and ACI 306R.
C. Examination: Examine conditions of work in place before beginning work; report defects. Verify granular sub-base materials have been placed to the depth shown.
D. Measurements: Take field measurements; report variance between plan and field dimensions.
E. Storage: Store cement in weathertight building, permitting easy inspection and identification. Protect from dampness; lumpy or stale cement will be rejected.
F. Protection:
1. General: Protect finish surfaces adjacent to locations scheduled for placement of concrete. Inspect forming placed against existing work and establish a tight, leak-proof seal before concrete is poured. Replace finish work defaced by concrete placement operations.
2. Reinforcement:
a. General: Deliver, store, and handle steel reinforcement to prevent bending and damage.
b. Vapor Barrier: Do not cut or puncture while placing reinforcement; repair damage and reseal before placement of concrete.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Tolerances: Install to allow application of subsequent finish materials within specified tolerances.
C. Earthwork: Refer to Section 31 20 10 - EARTHWORK for excavation, sub-base and backfill requirements. Conform to levels and grades shown.
D. Toxicant Chemicals: Refer to Section 31 31 00 - SOIL TREATMENT; apply under concrete walks, paving and where shown.
E. Formwork:
1. Workmanship: Provide formwork required to produce smooth concrete; straight, plumb and true to plane. Concrete out of line, level or plumb will be rejected.
2. Earth Forms:
a. General: Refer to Section 31 20 10 - EARTHWORK. Prior approval by the Architect is required for use of earthen forming where concrete may be placed directly against trench walls.
b. Architect’s Approval:
1. General: Footings must be increased 2 inches in width.
2. Trench Sides: Capable of standing without caving during concrete placement.
3. Sloughing: Not permitted before or during concrete placement.
3. Erection:
a. General: Design and erect per ACI 301 within tolerance limits of ACI 117 and limit concrete surface irregularities designated by ACI 347, Class B, 1/4 inch. Provide straight, true and sound form material, able to withstand deformation due to loading and the effects of moist curing. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
b. Construction: Construct forms to shapes, lines, grades and dimensions indicated; tight to prevent leakage, properly braced and tied together to maintain position and shape. Form bevels, grooves and recesses to neat, straight lines; chamfer edges at exposed corners and where indicated. Provide for easy removal without hammering, wedging or prying against concrete.

c. Expansion Joint Filler Strip Material:
   1. General: Install where shown.
   2. Exterior Paving: 30'-0" on center, maximum.
d. Form Release Agent: Coat contact surfaces of forms with form-release agent, per manufacturer's written instructions, before placing reinforcement.
e. Reuse of Formwork: Do not reuse split, warped, delaminated or otherwise damaged form-facing materials that require more than minor patching of contact surfaces. Clean and repair surfaces of forms to be reused in the Work. Apply new form-release agent.
f. Shores and Reshores: Refer to ACI 318, ACI 301, and recommendations in ACI 347 for design, installation, and removal.
g. Adjustment: Tighten forms, posts and shores during and immediately after concrete placement; readjust as required to maintain grades, levels and camber. Retighten forms and bracing before placement of concrete as required to prevent leaks and maintain proper alignment.

4. Vapor Barriers:
   a. General: Install under interior slabs on grade and where shown. Lap joints minimum 6 inches and seal watertight.
   b. Penetrations: Seal watertight; repair penetrations and damage with vapor barrier material, lapped minimum 6 inches over area and sealed with joint tape. Protect from damage due to forming operations.
5. Form Coating:
   a. General: Before placement of reinforcing steel, coat exposed face of forms to prevent moisture absorption from concrete and facilitate removal of forms; seal all cut edges.
   b. Re-use: Thoroughly clean and recoat form material acceptable for re-use.

F. Reinforcement:
1. General: Comply with the CRSI "Manual of Standard Practice" for placement of reinforcement.
2. Preparation: Clean reinforcement of rust and mill scale, earth, moisture, and other foreign materials before fabrication or placement.
3. Site Fabrication: Construct as shown. Do not bend or straighten reinforcement in manner that will injure material; heating of bars for bending is not permitted.
4. Welding: Per AWS D1.4.
5. Placement:
   a. General: Install in longest practical lengths. Accurately place, support, and secure reinforcement against displacement. Locate and support reinforcement with supports to maintain required concrete cover and minimize sagging.
   b. Wire Ties: Set with ends directed away from exposure, into concrete.
   c. Bars:
      1. Laps: Provide minimum center to center distance between parallel bars of 2-1/2 times diameter, 1-1/2 inches or 2-1/2 times maximum size coarse aggregate. Offset laps in adjacent bars.
      2. Splices: Lap 48 diameters, unless otherwise shown, and wire tie bars.
      3. Dowels: Place as shown; grease loose end to prevent concrete from bonding to dowel. Sleeves may be used when approved in writing by the Architect. Install through expansion joints.
   d. Welded Wire Fabric: Lap edges and ends of adjoining sheets at least one mesh spacing, unless otherwise indicated. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
6. Embedded Components:
   a. General: Install straight, level and plumb prior to concrete placement; brace, anchor and support items to prevent displacement or distortion.
   b. Inserts: Coordinate work of other Sections in setting bolts, anchors, and other components, as required.
7. Joints:
   a. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
   b. Dowel Joints: Install dowel bar and support assemblies at joints as shown; provide dowel sleeves, lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to reinforcement.

G. Cast-in-place Concrete:
   1. General: Placement of forms, inserts and reinforcements are subject to approval of Architect. Notify Architect and Structural Engineer at least 48 hours prior to placement of concrete.
   2. Cleaning:
      a. General: Remove dirt, wood chips, sawdust and other debris before concrete pour; use compressed air at inaccessible areas.
      b. Reinforcing: Clean reinforcement and other embedded items of substances that might impair bonding, prior to placement of concrete.
      c. Previously Placed Concrete: Roughen to 1/4 inch amplitude; clean with steel brush prior to applying bonding agent.
   3. Placing of Concrete:
      a. General: Maintain records for placement of all concrete. Place concrete in dry conditions; keep excavations free of water, ice, loose soil or debris.
      b. Weather Requirements: Per ACI 305R (Hot) and ACI 306R (Cold). Additionally, hot weather is defined as any period in which temperature exceeds 85 degrees F.
      c. Transportation: Handle concrete from mixer to place of deposit as rapidly as possible; using methods to prevent separation or loss of ingredients. Deposit in final position; avoid rehandling or flowing. Do not place partially hardened concrete in work. Do not wheel placement containers directly on top of reinforcing steel.
      d. Placement:
         1. General: Place concrete continuously between predetermined expansion, control and construction joints. Do not break or interrupt placement of concrete in manner that cause cold joints to occur.
         2. Footings: Place footings in one continuous pour.
         3. Concrete Slabs:
            a.) General: Lay slabs to required lines and grades, in pattern shown. Water subgrade at exterior concrete the night before placement; dampen again immediately before placement; standing water not allowed.
            b.) Joints: Refer to placement within formwork and upon slab finishes.
            c.) Flatness: Per ASTM E1155 - Determining Flatness and Levelness Using the F-Number System, or using a 10'-0" long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed 1/4 inch.
      e. Grout: Use at construction joints, and where shown.
      f. Compacting:
         1. General: Thoroughly work concrete around reinforcement, embedded components and into corners of forms. Consolidate concrete by internal vibration, only. Do not puddle, tamp or vibrate concrete which has already taken initial set or continue long enough to cause segregation of material.
         2. Slabs: Consolidate concrete on grade by spading and puddling and internal vibration.
         3. Formwork: Consolidate concrete in forms with high speed internal vibrators.
   4. Concrete Finishes:
      a. Slab Finish:
         1. General: Uniformly spread, screed and float concrete.
         2. Float: Apply at tile setting beds, where shown.
         3. Trowel: Apply two (2) steel troweling operations at surfaces to receive carpet, resilient materials, thinset tile and where left exposed, finished to achieve burnished surface. Follow second troweling with light brooming perpendicular to direction of traffic to form non-slip surface.
         4. Broom: Apply medium broom finish at exterior walks, ramps and stairs, perpendicular to direction of traffic flow.
         5. Accessible Routes of Travel: Provide concrete paving and concrete finishes along accessible routes of travel at least as slip-resistant as that described as a medium salted finish for slopes of less than 6%, and slip-resistant at slopes of 6% or greater.
         6. Slip-Resistive Aggregate: Uniformly spread 25 pounds per 100 square feet of dampened slip-resistive aggregate over surface in not more than two (2) applications. Tamp aggregate flush with, but do not press below surface. Apply float finish. After curing, lightly work surface with a steel wire brush and water to expose aggregate.
         7. Clear Hardener: Apply where shown.

8. Contraction Joints:
   a.) General: As shown.
   b.) Grooved Joints: Mark off exposed joints, where indicated, with 1/4 inch radius edging tool. Markings to be clean cut, straight and square with respect to border. Tool edges of exposed expansion and control joints, border edges, and wherever concrete adjoins other material or vertical surfaces.

b. Formed Surfaces:
   1. Rough-Formed: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347 limits for class of surface specified.
   2. Smooth-Formed: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.

c. Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

5. Curing:
   a. General: Refer to ACI 308R. Protect concrete from premature drying for minimum five (5) days following pour.
   b. Concrete in Forms: Keep wet until forms are stripped.
6. Removal of Forms:
   a. General: Sequence and time in manner to insure safety of concrete structure; remove without damage to concrete surfaces.
   b. Stripping:
      1. General: Maintain forms in place for not less than the following number of days when air temperature in contact with concrete is 60 degrees F or above. Add an additional day for each day that temperature falls below 60 degrees F, unless otherwise directed.
      2. Slab Edge Screeds: Five (5) days.
      3. Forms: Five (5) days.
7. Defective Concrete:
   a. General: Remove or cut out defective concrete and repair before concrete is completely cured, as directed by Architect.
   b. Defective Concrete is:
      1. General: Concrete not meeting specified 28-day strength.
      2. Durability and Appearance: Concrete containing rock pockets, voids, spalls, cracks, exposed reinforcing, or other defects.
      3. Alignment: Incorrectly formed concrete, out of plumb or level.
      4. Deleterious Materials: Concrete containing embedded wood or other debris.
      5. Unauthorized Patching: Concrete with patched voids that were not filled under Architect's direction.
      6. Embedded Items: Concrete not containing required embedded items.
   c. Patching:
      1. General: Repair exposed concrete to match surrounding concrete finish as required by the Architect.
8. Protection: After placement, finishing and completion of required repairs, protect exposed corners, edges, and surfaces of concrete from damage, including staining and contamination during remainder of construction period.

3.3 FIELD QUALITY CONTROL:

A. Formwork: Inspect erected formwork, shoring and bracing to ensure that work is in accordance with formwork design and that supports, fastenings, wedges, ties and embedded items are secure to prevent displacement and distortions.

B. Concrete:
   1. General: Per CBC, Chapter 17; agency selected and paid for by Owner.

2. Field Testing:
   a. General: Take three (3) cylinders and test, for each 50 cubic yards of each concrete mix being placed each day. Test first cylinder at the age of 7 days and the other at 28 days; cylinder for 28-day test will not be broken if cylinder for 7-day test meets 28 day strength. Hold third cylinder for 56 day test, if required.
   b. Reinforcement: Make one (1) tensile test and one (1) bend test of specimen taken from each 10 tons of steel delivered to the site.
3. Retesting: Cost of retests or coring because of understrength, questionable or defective concrete will be paid for by Contractor.

3.4 CLEANING: Clean exposed surfaces of architectural concrete after finish treatment to remove stains, markings, dust, and debris. Wash and rinse surfaces per concrete finish treatment manufacturer's written recommendations. Do not use cleaning materials or processes that could change the appearance of concrete finishes. Protect adjacent surfaces from staining or damage due to cleaning operations.

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Section 03 35 43
POLISHED CONCRETE FINISHING

PART 1 - GENERAL

1.1 SUMMARY: Provide Polished Concrete Finishing, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Concrete Institute (ACI):
   1. ACI 117-10: Specification for Tolerances for Concrete Construction.
   2. ACI 302 1R-15: Guide for Concrete Floor and Slab Construction.
   3. ACI 310.1R-20: Specification for Polished Concrete Slab Finishes.

B. American Society of Concrete Contractors (ASCC): Standards and publications.

C. American Society for Testing and Materials (ASTM):
   1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
   2. ASTM C779: Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
   3. ASTM D523: Standard Test Method for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry.
   4. ASTM E430: Standard Test Methods for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry.
   5. ASTM E1155: Standard Test Method for Determining Floor Flatness and Levelness using the F number system.
   6. ASTM F609: Standard Test Method for Using a Horizontal Pull Slipmeter (HPS).
   7. ASTM F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
   8. ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
   9. ASTM F2170: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
   10. ASTM E1155: Standard Test Method for Determining Floor Flatness and Levelness using the F number system.

D. Concrete Polishing Association of America (CPAA): Standard specifications, concrete mix and placement guidelines, aggregate classifications and surface finish levels.

E. National Floor Safety Institute (NFSI): B101.0 - Walkway Surface Auditing Procedure for the Measurement of Walkway Slip Resistance.

1.3 SUBMITTALS:

A. General: Submit product data.

B. Samples: Submit manufacturer's standard liquid dye colors.

C. Test Reports: Submit NFSI certification that polished floor surfaces achieve a static coefficient of friction of not less than 0.5.

D. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE:

A. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience; manufacturer approved.

B. Pre-Installation Conference:
   1. General: Coordinate with Section 03 30 00 - CAST-IN-PLACE CONCRETE requirements.
   2. Attendees: Concrete finisher (including supervisor), concrete polisher (including supervisor), technical representative of liquid applied product manufacturer(s) and NFSI walkway auditor.
   3. Agenda: Review concrete mix designs, aggregate size and placement; coordinate depth of cut for grinding and examine procedures for ensuring quality of concrete finish.

C. Mock-up: 10'-0" x 10'-0" sample panel at location as directed, installed under conditions similar to those which will exist during actual placement. Mock-up will be used to judge workmanship, concrete substrate preparation, operation of equipment, material application, color selection, shine, and demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Liquid Applied Products:
   1. General: Products manufactured by Ultraflor Systems.

2. Alternate Manufacturers: Comparable products manufactured by L. M. Scofield Company, or accepted equal.
3. Densifier:
   a. General: FLOR-SIL Lithium Densifier.
   b. Protectant: FLOR-SHIELD Surface Densifying and Surface Protective Treatment
4. Grout and Pin Hole Filler: FLOR-FILL (RSG) Reactive Surface Grout.
5. Dye: FLOR-COLOR Micronized Water Borne High Performance Dye, mocha color over gray concrete.
6. Polish: FLOR-FINISH Stain and Wear Protection Treatment (high-gloss).
7. Cleaning Agents: As recommended by manufacturer.

B. Accessories: Patching compound, grout material and protective covering per CPAA Standard specifications.

2.2 EQUIPMENT: Field and edge grinding, polishing and burnishing equipment and products per manufacturer specifications, as required to achieve the specified finish level.

2.3 MIXES:

A. General: Refer to Section 03 30 00 - CAST-IN-PLACE CONCRETE; coordinate placement of selected aggregate sizes and types in mix.
B. Liquid Applied Products: Per manufacturer's directions.
C. Aggregate: Coordinate placement of selected aggregate sizes and types in mix.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements: Do not proceed when air, surface, or material temperatures are expected to fall below 40 degrees F within four (4) hours of expected application.
B. Examination:
   1. General: Examine conditions of work in place before beginning work; report defects.
   2. Concrete Strength: Verify concrete has reached a minimum 3,500 psi 28 day strength.
C. Measurements:
   1. General: Take field measurements; report variance between plan and field dimensions.
   2. Concrete Level Tolerance: Verify that concrete placement is of sufficient depth to match the level of other specified floor materials after grinding and polishing.
D. Protection: After completion of polishing, protect polished floors from subsequent construction activities with protective covering.
E. Delivery: Protect materials during handling and application to prevent damage or contamination.
F. Surface Preparation:
   1. General: Prepare and clean concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with liquid applied products and polishing.
   2. Vapor Testing Concrete Floors:
      a. Alkalinity: ASTM F710; pH between 8 and 10.
      b. Moisture Vapor Transmission Rate: Per ASTM F1869; not more than 5 pounds per 1000 square feet in 24 hours.
      c. Relative Humidity: Per ASTM F2170; not more than 75 percent.
G. Mock-up: Provide a sample panel, in a location and size as directed by the Architect. Use processes and techniques to be used on permanent work, including curing procedures. Show uniformity of exposed aggregate, sheen and color of cut and shine of floor surface and edges. Retain accepted sample panel through completion of work for use as a quality standard for finished work.

3.2 APPLICATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Grinding: Use bonded abrasives, in as many abrasive grits necessary to achieve an aggregate exposure of CPAA Level B - Small Aggregate (1/16 inch cut).
C. Polishing: Grind and polish concrete per ASTM E430 Level B - Medium Reflectivity (reading of 36 to 50) Sheen, matching accepted mock-up.

3.3 FIELD QUALITY CONTROL: For static coefficient of friction, a reading of not less than 0.5 for level floor surfaces shall be achieved and documented, as determined by certified an NFSI walkway auditor using the NFSI walkway surface auditing procedure.

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Division 04 - NOT USED

NOT USED

* End Division 04 *

Division 05 - METALS

Section 05 05 00
COMMON WORK RESULTS FOR METALS

PART 1 - GENERAL
1.1 SUMMARY: Provide Common Work Results for Metals, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM):
1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
2. ASTM F2329: Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.
B. American Welding Society (AWS):
1. AWS A2.4: Structural Welding Symbols.
2. AWS D1.1: Structural Welding Code - Steel.
3. AWS D1.3: Structural Welding Code - Sheet Steel.
C. Steel Structures Painting Council (SSPC):
1. General: Painting Manual.
2. SSPC-Paint 15: Steel Joist Shop Primer.
3. SSPC-Paint 23: Latex Primer for Steel Surfaces.
1.3 SUBMITTALS:
A. General: Submit product data, shop drawings, and test reports.
B. Certificates: Certify that welders employed on the Work have met AWS qualifications.
1.4 QUALITY ASSURANCE:
A. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.
B. Source Quality Control: Material delivered with certificates classified as "identifiable"; without certificates classified as "unidentifiable".

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Bolts, Nuts and Washers:
1. General: Comply with ASTM F2329 where connector may be exposed to moisture.
2. Machine Bolts, Nuts and Threaded Rods: ASTM A307, Grade A, including Supplementary Requirement S1; nuts per ASTM A563.
3. Anchor Bolts: ASTM A307, Grade A or C, including Supplementary Requirement S1; nuts per ASTM A563.
4. Washers: ASTM F436; compressible washer type direct tension indicators, ASTM F959.
5. Lock-washers: ANSI B27.1; helical spring type, carbon steel; medium series.
B. Welding:
1. General: Per AWS D1.1.
2. Sheet Steel: AWS D1.3.
C. Primer:
1. General: Fast-curing, lead- and chromate-free, universal modified-alkyd primer with good resistance to normal atmospheric corrosion, complying with performance requirements of FS TT-P-664. Comply with the requirements of Section 09 91 00 - PAINTING for surfaces to receive subsequent coats of paint.
2. Shop Primer: SSPC-Paint 15; VOC compliant.
3. Latex Primer: SSPC-Paint 23; VOC compliant.

PART 3 - EXECUTION:
3.1 PREPARATION:
A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Placement: Refer to Section 05 40 00 - METAL STUD FRAMING and 05 50 00 - METAL FABRICATIONS.

* * *

Section 05 41 00
COLD-FORMED METAL STUDS

PART 1 - GENERAL

1.1 SUMMARY: Provide Cold Formed Metal Stud Framing, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM):
   1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
   2. ASTM A123: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

B. American National Standards Institute (ANSI):
   1. General: Cold-Formed Steel Design Manual
   2. AISI S200: North American Standard for Cold-formed Steel Framing – General Provisions.
   3. ANSI Z49.1: Safety in Welding, Cutting, and Allied Processes.

C. AWS D1.3: Structural Welding Code: Sheet Steel.

D. Steel Stud Manufacturers Association (SSMA): Product Technical Guide.

E. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.

1.3 SUBMITTALS:

A. General: Submit product data, shop drawings and samples.

B. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Metal Stud System:
   1. General: Manufactured by California Expanded Metal Products Co.
   2. Alternate Manufacturers: Comparable products manufactured by Clark Dietrich Bulding Systems, LLC, or accepted equal.

B. Stud Types:
   1. General: Provide types designed for screw application of gypsum wallboard.
   2. Structural Studs:
      a. General: Roll-formed load-bearing type with wide flanges and punched webs; 16 gage, unless otherwise shown.
      b. Steel Sheet: ASTM A1011(painted) and ASTM A792 (Zinc-alloy coated); 50,000 psi minimum yield point for 16 gage and heavier; 33,000 psi for 18 gage and lighter; galvanized where shown.
      c. Configuration: Channel type, Cee type where shown.
      d. Finish: VOC compliant red oxide paint.
   3. Bridging: 1-1/2-inch deep by 16 gage minimum.
   4. Strap Bracing: Minimum of 1-1/2-inch wide by 18 gage unless noted otherwise.
   5. Tracks: Deep leg type, unpunched, same gage, size, and finish as studs with minimum 18 gage thickness.
   6. Compensation Tracks / Slip Tracks: Deep leg type with a flange width of 2½ inches. Track shall be same nominal depth as stud/track with allowance for slip of standard deep leg track. Minimum 14 gage.
   7. Plates, Gussets Clip Angles: Minimum 14 gage. Clip angles shall be a minimum of 2 inches x 2 inches.

C. Fasteners:
   1. General: Refer to Section 05 05 00 - COMMON WORK RESULTS FOR METALS.
   2. Expansion Bolts: FS FF-S-325, Group III, expansion shield (self-drilling tubular expansion shell anchor bolts); Type 1 or 2, unless otherwise shown.
   3. Powder Driven Fasteners:
      a. General: X-ZF fasteners manufactured by Hilti, Inc.; size as shown.
      b. Alternate Manufacturers: Comparable products with current ICBO approval and equal or greater rated load capacity, manufactured by the US Anchor Corp., or accepted equal.

4. Screws: Type S bugle head; sizes recommended by gypsum board manufacturer.

D. Welding: AWS D1.3-8 Structural Welding Code-Sheet Metal (field welding of material shall not be permitted for 20 gage material or thinner)
E. Wire Hangers: 8 gage galvanized soft steel wire.
F. Neoprene Tape: ASTM D1056, Grade SCE41, soft sponge neoprene with adhesive one side; black; 1/4 inch x 1/2 inch, unless otherwise shown.

PART 3 - EXECUTION

3.1 PREPARATION:
A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Metal Framing:
1. General: ANSI A97.2.
2. Structural Studs: MLSFA.
C. Assemblies:
1. Fire Rated: Per UL and code requirements. Use one manufacturer for each assembly, unless otherwise permitted by governing authorities.
2. Sound Controlled: Use one manufacturer for each assembly, unless otherwise permitted by manufacturer.
D. Metal Stud Partitions:
1. General: Install complete with matching runner tracks and accessories. Align runner tracks accurately to partition layouts.
2. Floor Runners: Secure with 1/4 inch diameter expansion bolts or powder driven fasteners at least 1 inch long, where permitted by code. Space fasteners 4 inches from ends of each piece; maximum 24 inches on center intermediately; minimum of 2 fasteners per piece of runner.
3. Ceiling Runners:
a. General: Install to heights and levels, or to structure above as shown.
b. To Concrete: Fasten as specified for floor runners.
c. To Structural Steel: As specified for metal decking; secure with welds or other appropriate means in lieu of powder driven fasteners.
4. Studs: Gages, depths, and spacing shown. Where not shown, provide per stud manufacturer's recommendations.
5. Stiffeners: 2 rows at third points for studs with finish one side only; one row at midpoint for studs with finish both sides. Snap into punched web of each stud; nest laps and wire tie.
6. Chase Wall Partitions: Cross brace at quarter points with 5/8 inch thick gypsum wallboard; braces 12 inches by width of partition. Fasten to studs with 3 fasteners per edge.
E. Structural Stud Partitions:
1. General: Install complete with matching runner tracks and accessories. Align runner tracks accurately to partition layouts.
2. Anchor Bolts:
a. General: Install 1/2 inch diameter hook anchors not more than 48 inches on center; minimum of 2 bolts per piece of track; locate one bolt within 12 inches of each end. Use 8 inch long bolts; embed into concrete at least 7 inches, unless otherwise shown.
b. Contractor's Option: Expansion bolts or powder driven fasteners of acceptable types and sizes may be used in lieu of anchor bolts, where permitted by code.
3. Runner Tracks: Fasten floor track with appropriate anchors; fasten top track as shown. Butt weld track or splice with channel inserts fastened with 2 sheet metal screws, bolts, or rivets at each corner.
4. Studs: Gages, depths, and spacing shown. Where not shown, provide per stud manufacturer's recommendation. Install plumb, square, and straight; weld flanges to track. Provide openings with top and bottom headers and jack studs over openings; weld connections.
5. Bridging: Per manufacturer's recommendations.
F. Furred Partitions:
1. General: Install furring channels at 24 inches on center; level and plumb with steel shims.
2. To Structural Steel: As specified for metal stud partitions.

G. Backing Plates: Install for built-in items; attach to metal studs by welds or sheet metal screws as applicable.
H. Suspended Ceilings:
   1. General: Install for gypsum wallboard ceilings. Where ductwork or other obstructions prohibit use of specified system, provide heavier system per referenced Standard.
   2. Hanger Wires:
      a. General: Space at 48 inches on center both ways; do not support more than 16 square feet of ceiling per wire. Locate a hanger within 6 inches of end of main runners.
      b. Concrete Supports: Wrap wires around reinforcing steel with a twist or loop and embed at least 2 inches into concrete or attach to appropriate type inserts.
      c. Metal Decking: Wires may be attached by penetrating through decking, twisted, and looped; no penetrations permitted through electrified cells. If provided as integral part of metal decking, wire may be attached through hanger slots.
      d. Steel Supports: Wrap around or through steel, or attach by other acceptable methods.
   3. Runner Channels: Space not over 48 inches on center; wrap each hanger wire twice around runner channel.
   4. Furring Channels: Attach to runner channels at 16 inches on center with snap-on clips or other acceptable methods.
   5. Openings: Reinforce as required for support of mechanical and electrical fixtures.
   6. Seismic Restraint: As shown.
I. Galvanizing Repair: Repair galvanizing damaged during fabrication and installation; refer to Section 05 50 00 - METAL FABRICATIONS.
J. Tolerances:
   1. Exterior Load-Bearing Wall Framing: Horizontal deflection of 1/240 of the wall height.
   2. Interior Load-Bearing Wall Framing: Horizontal deflection of 1/240 of the wall height.
   3. Exterior Non-Load-Bearing Curtain-Wall Framing: Horizontal deflection of 1/240 of the wall height.
   4. Ceiling Joist Framing: Vertical deflection of 1/240 of the span.

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Section 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY: Provide miscellaneous Metal Fabrications, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. Aluminum Association (AA): The Surface Treatment and Finishing of Aluminum and its Alloys.
B. Aluminum Anodizers Council (AAC): Finishing standards.
C. American Institute of Steel Construction (AISC):
   1. AISC 303: Code of Standard Practice for Steel Buildings and Bridges.
   2. AISC 360: Specification for Structural Steel Buildings.
D. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
E. American Welding Society (AWS):
   1. AWS A2.1: Structural Welding Symbols.
   2. AWS D1.1: Structural Welding Code - Steel.
   3. AWS D1.3: Structural Welding Code - Sheet Steel.
F. National Association of Architectural Metal Manufacturers (NAAMM): Metal Finishes Manual for Architectural and Metal Products.

1.3 SUBMITTALS:

A. General: Submit product data, shop drawings and samples.
B. Closeout: Submit maintenance data and guarantee.

1.4 QUALITY ASSURANCE:

A. General: Fabricator and installer specializing in the work of this Section with minimum three (3) years documented experience.
B. Welding: Performed by certified welders per AWS.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. General: Refer to General Notes and specifications drawings.
B. Steel:
   1. General: ASTM A36.
   2. Tubing (Rectangular and Square Hollow Structural Sections [HSS]): ASTM A500, Grade B.
   3. Pipe (Round Hollow Structural Sections [HSS]): ASTM A53, Type E or S, Grade B.
C. Fastenings:
   1. General: Bolts, nuts, screws, washers, and other various fastenings necessary for proper erection of work; refer to Section 05 05 00 - COMMON WORK RESULTS FOR METALS. Galvanized steel fastenings or other non-rusting types for exterior steel work.
   2. Exposed in Finished Surfaces: Tamperproof countersunk Phillips flat head screws, unless otherwise shown; finish to match adjacent surfaces.
   3. Plastic Screw Anchors:
      a. General: Plastic Anchors manufactured by Hilti, Inc.
      b. Alternate Manufacturers: Comparable products manufactured by U.S. Anchor Corp., or accepted equal.
      c. Plastic: Type HUD.
      d. Self-drilling: Type HFP.
      e. Impact: Type HPS.
   4. Drilled-in Concrete Anchors: See Section 05 12 00 - STRUCTURAL STEEL FRAMING.
D. Galvanizing:
   1. General: Hot-dip process per ASTM A123 or ASTM A153, as applicable. Minimum coating: 2 oz. per square foot.
   2. Repair Treatment:
      a. Rod: Per ASTM A780.
      b. Coating: Per SSPC-Paint 30: Weld-Through Inorganic Zinc Primer.
E. Plastic Cement: FS SS-C-153, Type 1.
F. Non-shrink Grout:.
   1. General: MasterFlow 555 manufactured by the BASF Chemical Co.

2. Alternate Manufacturers: Comparable products manufactured by the Euclid Chemical Co., or accepted equal.

G. Protective Coatings:
1. Backing Paint: Zinc chromate, alkyd.
2. Bituminous Coating: FS TT-C-494, Type II; bituminous.

H. Primer: Refer to Section 05 05 00 - COMMON WORK RESULTS FOR METALS and Section 09 91 00 - PAINTING.

2.2 FABRICATION:

A. Workmanship:
1. General: Refer to General Notes and specifications drawings. Shop assemble work in largest practical sections; minimize field connections. Grind smooth parts exposed to view; remove weld marks and leave free of fabrication marks. Miter corners and edges unless otherwise shown. Make members true to length so assembling may be done without fillers. Bends, twists, open joints in finished members, or projecting edges or corners at connections will not be permitted. Miter, cope, and block carefully to produce tight hairline joints. Provide lugs, clips, connections, bolts, and fastenings necessary to complete fabrication.
2. Exterior Exposed Steel: Comply with AISC Architecturally Exposed Structural Steel fabrication requirements.
3. Galvanizing: Galvanize steel in exposed exterior locations and in areas where moisture may be present at interior locations. Treat all areas burned off or damaged during fabrication with specified repair compound.
4. Reinforcement: Provide proper reinforcement for hardware, and other fabricated metal work, as required.
5. Welding: Use sequence welding to minimize distortion and heat stresses. Weld by shielded electric arc process per AWS. Use continuous welding along entire area of contact, except where spot welding is permitted. Grind all welds smooth on exposed surfaces. Spot welding not permitted on exposed surfaces.
6. Shop Painting and Priming of Surfaces to be Painted: Per SSPC standards.
7. Dissimilar Metals: Isolate with bituminous coating.

B. Fabrications:
1. General: Fabricate the following items, complete as shown.
2. Countertop Supports: Fabricate from steel angles as shown.
3. Bollards: Steel pipe sections with open ends capped, welded and ground smooth.
4. Gate Frames:
a. General: Fabricate from galvanized structural steel shapes and plates as shown.
b. Frame and pickets:
1. General: Welded construction as shown.
2. Perforated Panel:
a.) General: Round hole pattern, galvanized steel with 3/16 inch diameter holes on 5/16 inch centers with 22 percent open space manufactured by Pacific Grating, Inc.
b.) Alternate Manufacturers: Comparable products manufactured by the McNichols Co., or accepted equal.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Scheduling: Verify and coordinate placement of anchors and bolts in concrete.
B. Examination: Examine conditions of work in place before beginning work; report defects.
C. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown in General Notes and specifications drawings, and as specified.
B. Performance:
1. General: Install with workers skilled in the particular type of work required.
2. Coordination: Deliver miscellaneous metal items to be installed in concrete or masonry, complete with all clips, anchors or bolts necessary to secure them in place.
3. Workmanship: Set work plumb and true; properly assemble and erect in a rigid and workmanlike manner. Do cutting, punching, drilling and tapping for attachment of other work coming into contact with fabricated metal work where indicated or as directed. Do necessary

cutting, drilling, and fitting for installation of fabricated metal work. Execute drilling, cutting, and fitting carefully; when required, fit work at job before finishing. No burning in field permitted. Replace, or repair parts damaged or injured during erection in an acceptable manner. Drill holes for fasteners to exact diameter as recommended by fastener manufacturer. Oversized holes or holes not properly located that produce misalignment of fastener will be rejected.

4. Exposed Steel: Comply with AISC Architecturally Exposed Structural Steel installation requirements.
5. Galvanizing: Treat areas burned off or damaged during fabrication or erection with specified repair compound.
6. Field Touch-up: Touch-up damaged surfaces and field welds of steel, scheduled to be painted, per SSPC standards.
7. Protection:
   a. General: After erection, provide proper protection for fabricated metal items from other construction operations.
   b. Dissimilar Metals: Isolate with bituminous coating.

C. Installation:
   1. General: Install the metal items, complete as shown.
   2. Counter Supports: Anchor to walls and install countertop as shown.
   3. Bollards: Set in concrete and fill, as shown.
   4. Gate Frames: Set plumb, true to level and line and anchor with bolts as shown. Gates shall move freely without wracking and binding

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Division 06 - WOOD, PLASTICS & COMPOSITES

Section 06 05 00
COMMON WORK RESULTS FOR WOOD, PLASTICS AND COMPOSITES

PART 1 - GENERAL

1.1 SUMMARY: Provide Common Work Results for Wood, Plastics and Composites, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM):
   1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
   2. ASTM F2329: Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners

B. American Society of Mechanical Engineers (ASME): Standards for anchors and fasteners.

C. American Wood Protection Association (AWPA): AWPA Book of Standards.

1.3 SUBMITTALS:

A. General: Submit product data and samples if specifically requested.

B. Certificates: Submit mill certificate verifying pressure treatment compliance as specified, for each shipment received, in addition to a stamp on each piece of lumber, from an approved independent inspecting agency operating under the overview of the American Lumber Standard Committee, Inc. (ALSC).

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Hangers, Clamps, Straps and Anchors:
   1. General: Manufactured by Simpson Strong Tie Co., Inc.; types as shown.
   2. Alternate Manufacturers: Comparable products with current ICC ES approval and equal or greater rated load capacity, manufactured by USP Lumber Connectors, or accepted equal. Submit ICC ES Report for review for all alternate products.
   3. Interior Exposed Connectors: Classic Collection; type as shown.
   4. Special Fabrications: Refer to Section 05 50 00 - METAL FABRICATIONS.

B. Anchors and Fasteners:
   1. General: Comply with ASTM F2329 where connector may be exposed to moisture.
   2. Nails: ASTM F1667, common wire; hot-dipped galvanized for pressure preservative treated and exterior work; electro-galvanized for other work.
   3. Bolts and Nuts: ASTM A307, Grade A, including supplementary requirement S1; galvanized for exterior work.
   4. Washers: Malleable iron or standard cut steel; galvanized for exterior work.
   5. Screws: Wood and lag screws per ANSI/ASME B18.2.1; galvanized for exterior work.
   6. Specialty Fasteners:
      a. General: Manufactured by Hilti, Inc.; galvanized for exterior work.
      b. Alternate Manufacturers: Comparable products with current ICC ES Report and equal or greater rated load capacity, manufactured by the MKT Fastening, LLC, or accepted equal.
      c. Expansion Bolts: Kwik Bolt HDG.
      d. Concrete Screws: Kwik Con II; galvanized for exterior work.
      e. Powder Actuated Fasteners: Type as shown; galvanized for exterior work.
      f. Screw Anchors: Type HUD-1 (plastic), HFP self drilling or HPS impact as required.

C. Adhesive: CS 35-61, Type II, water-resistant.

D. Wood Preservative:
   1. General: Wood Preservatives manufactured by J. H. Baxter Co.; factory applied treatment, unless otherwise noted.
   2. Alternate Manufacturers: Comparable products manufactured by the California Cascade Industries, or accepted equal.
   3. Pressure Treatment: Per AWPA Standards using water borne preservative.

4. Surface Application: Per AWPA Standards; Clear Type.
5. Fire Retardant: Per AWPA Standards, Exterior Type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Placement: Refer to Section 06 20 00 - FINISH CARPENTRY and 06 41 17 - PLASTIC LAMINATE VENEER CASEWORK.

* * *

Section 06 20 00
FINISH CARPENTRY

PART 1 - GENERAL
1.1 SUMMARY:
A. General: Provide Finish Carpentry, as shown and specified per Contract Documents.
B. Lumber: Softwood and hardwood.
C. Sheet Materials: Softwood plywood.
1.2 REFERENCES:
A. American Wood Protection Association (AWPA): AWPA Book of Standards.
B. The Engineered Wood Association (APA): Grading standards.
C. National Institute of Standards and Technology (NIST): NIST PS-20 - American Softwood Lumber Standard.
D. California Redwood Association (CRA): Grading Standards.
E. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS)
1.3 SUBMITTALS:
A. General: Submit product data, shop drawings and samples.
B. Certificates: WI Certified Compliance Certificate for fabrication and installation of millwork in grade specified.
C. Closeout: Submit maintenance data and guarantee.
1.4 QUALITY ASSURANCE: Company specialized in the products specified in this Section with a minimum of three (3) years documented experience.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Lumber:
1. General:
a. Grading: NIST PS-20 and applicable association rules under which each lumber species is produced.
b. Moisture Content: Per WI standards; not greater than 19 percent maximum for lumber and 15 percent for plywood; air-dry or kiln-dry.
2. Exposed Softwood:
a. Douglas Fir: WI Custom Grade.
b. Redwood: WI Custom Grade.
B. Plywood: Douglas fir; APA, A-C Group 1 Exterior.
C. Wood Preservative Treatment: Refer to Section 06 05 00 - COMMON WORK RESULTS FOR WOOD, PLASTICS AND COMPOSITES.
D. Adhesive: CS 35-61, Type II, water-resistant.
E. Fasteners: Of size and type to suit application; hot dipped galvanized at concealed locations; bright finish in exposed locations; refer to Section 06 05 00 - COMMON WORK RESULTS FOR WOOD, PLASTICS AND COMPOSITES.
F. Caulking Compound: Per Section 07 92 10 - JOINT SEALERS.
2.2 FABRICATION:
A. General: Comply with WI requirements for moisture content at time of fabrication.
B. Millwork: Manufacture to NAAWS Custom Grade standards, except where specifically noted otherwise. Mill to dimensions and profiles shown. Provide long lengths for field cutting and fitting.

PART 3 - EXECUTION
3.1 PREPARATION:
A. Environmental Requirements: Do not install interior finish work until building is closed, temperature can be maintained above 50 degrees F and plaster is dry.
B. Examination: Examine conditions of work in place before beginning work; report defects.
C. Measurements: Take field measurements; report variance between plan and field dimensions.
D. Protection: Per Section 01 43 00 - QUALITY ASSURANCE.
3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Millwork:
   1. General: Do not install millwork until wet operations are complete, with concrete, masonry and plaster work thoroughly dry, and millwork has been primed or sealed under Section 09 91 00 - PAINTING. Reseal cut edges, surfaces and ends as required.
   2. Interior:
      a. General: Install plumb, square and true, securely wedged and anchored to structure. Countersink face nails.
      b. Softwood Plywood: Install with joints bearing on studs or solid backing. Slightly bevel adjoining panel edges by sanding before installation. Finish nail around perimeter and at studs; set nails.
   3. Trim Members: Install level, plumb and true, with members neatly and accurately scribed in place. Install standing trim in single lengths, running trim in as long lengths as practical for species specified. Butt joints beveled together, exterior angles mitered, interior angles coped.
   4. Nailing:
      a. Trim: Set fasteners 1/16 inch, minimum.
      b. Plywood: As shown, set fasteners 1/16 inch, minimum.
   5. Site Applied Wood Treatment: Apply preservative treatment in accordance with manufacturer's instructions. Brush apply two (2) coats of preservative treatment on wood in contact with cementitious materials and roofing and related metal flashings. Treat site-sawn cuts and drilled holes. Allow preservative to dry prior to erecting members.

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Section 06 41 17
PLASTIC LAMINATE VENEER CASEWORK

PART 1 - GENERAL

1.1 SUMMARY: Provide Plastic Laminate Veneer Casework, as shown and specified per Contract Documents.

1.2 REFERENCES:
- A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
- B. The Engineered Wood Association (APA): Grading standards.
- C. Builders Hardware Manufacturers Association (BHMA): BHMA A156.9 - Cabinet Hardware.
- D. National Institute of Standards and Technology (NIST): NIST PS-20 - American Softwood Lumber Standard.
- E. National Electrical Manufacturers Association (NEMA): NEMA LD3 - High Pressure Decorative Laminates.
- F. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS)

1.3 SUBMITTALS:
- A. General: Submit product data and samples.
- B. Shop Drawings: Submit manufacture and installation details, including fastenings, for review. Provide WI Certified Compliance Certificate.
- C. Certificates: Submit WI Certified Compliance Certificate for fabrication and installation of all casework in grade specified.
- D. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE: Fabricator and installer specializing in the work of this Section with minimum five (5) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:
- A. Plastic Laminate:
  1. General: Class I high-pressure decorative laminate plastic manufactured by Wilsonart International; UBC Class II flame spread.
  2. Alternate Manufacturers: Comparable products manufactured by the Formica Corp., or accepted equal.
  3. Plastic Veneer: NEMA Standard .039 inch postforming grade and .045 inch general purpose grade; satin finish.
  4. Backing Sheets: .020 inch thick standard laminate.
  5. Colors and Patterns: Selected by Architect; more than one per cabinet may be requested.
- B. Lumber: NAAWS Custom Grade standards; particleboard and MDF not permitted.
- C. Casework Hardware:
  1. General: Per NAAWS, BHMA A156.9, and as follows:
  2. Finish: Exposed hardware; dull chromium (US26D).
  3. Hinges:
     a. General: Model No. 374-26D, manufactured by Rockford Process Control, Inc.
     b. Alternate Manufacturers: Comparable products manufactured by the Stanley Hardware Division of the Stanley Works, or accepted equal.
  4. Door and Drawer Pulls:
     a. General: Model No. MC-402-4, satin clear anodized, manufactured by the Engineered Products Co. (EPCO).
     b. Alternate Manufacturers: Comparable products manufactured by Häfele America Co., or accepted equal.
  5. Magnetic Catches:
     a. General: Model No. 592 manufactured by the Engineered Products Co. (EPCO)
     b. Alternate Manufacturers: Comparable products manufactured by the Ives Division of IR Security & Safety, or accepted equal.
  6. Silencers:
     a. General: Battalion Door Silencer manufactured by W.W. Grainger, Inc..
     b. Alternate Manufacturers: Comparable products manufactured by North American Door Corp. (NADCOR), or accepted equal.

7. Locks:
   a. General: Small Pin manufactured by the Olympus Lock, Inc.; provide unit for to fit cylinders as specified in Section 08 71 00 - DOOR HARDWARE.
   b. Alternate Manufacturers: Comparable products manufactured by National Cabinet Lock, or accepted equal.
8. Drawer Guides:
   a. General: Manufactured by Accuride International, Inc.
   b. Alternate Manufacturers: Comparable products manufactured by the Knape and Vogt Manufacturing Co, or accepted equal.
   c. Small Drawer: Model No. 2037; 75 lbs.
   d. Medium Drawer: Model No. 7432; 100 lbs.
   e. Large Drawer: Model No. 4032; 150 lbs.
9. Wire Control Hole Plugs (Grommet):
   a. General: Model No. P-C80-AL manufactured by Outwater Plastic Industries, Inc.; color selected by the Architect.
   b. Alternate Manufacturers: Comparable products manufactured by the Stanley Hardware Division of the Stanley Works, or accepted equal.
10. Adjustable Shelf Hardware:
    a. General: KV 83/183 Series manufactured by the Knape and Vogt Manufacturing Co.
    b. Alternate Manufacturers: Comparable products manufactured by the Stanley Hardware Division of the Stanley Works, or accepted equal.

D. Fasteners and Adhesives: Per WI requirements; refer to Section 06 05 00 - COMMON WORK RESULTS FOR WOOD, PLASTICS AND COMPOSITES.

2.2 FABRICATION:

A. General: Manufacture per Architectural Woodwork Standards (NAAWS), Section 10 - Casework, to NAAWS Custom Grade standards, except where specifically noted otherwise, per AWS. Provide WI Certified Compliance Label for grade specified, to each elevation of casework.

B. Construction:
1. General: Completely face exposed and semi-exposed surfaces, with plastic laminate. As far as practical, fabricate casework complete as a unit in the shop; backs required.
2. Type: Style A Frameless.
3. Door and Drawer Fronts: Cabinet door Interface Style 1- Overlay.
4. Shelves: Plastic laminate faced plywood.
5. Filler Panels: As required; to match cabinets as shown.

C. Countertops:
1. Plastic Laminate: Fabricate from plastic laminate per Architectural Woodwork Standards (NAAWS), Section 11 - Countertops, Assembly 2 - Deck Mount, manufacturer assembled, as shown. Provide in longest practicable length; minimize number of joints. Make joints neat and watertight; abutting ends splined and adjoining surfaces flush; ease exposed edges. Provide backing sheet on bottom side of countertops where plumbing fixtures are to be installed or where exposed to moisture. Core thickness as shown; not less than 3/4 inch. Provide 1 inch radius at outside corners.
2. Solid Plastic: Refer to Section 06 61 16 - PLASTIC PANEL FABRICATIONS.
3. Laboratory Countertops: Fabricate solid phenolic polyester countertop per NAAWS, as shown.

D. Casework Hardware:
1. General: Prefit; remove for application of finish. Keep hardware with casework to which it has been prefit; reinstall after casework is anchored in place, as shown.
2. Hinges: Four (4) No. 8 screws into end panel and door panel; 1-1/2 pair on 7'-0" high cabinet doors; tall cabinet doors must swing 180 degrees when adjacent to low cabinets without interference from counter top.
3. Drawer and Door Pulls: Comply with CBC 1125 B.4.
4. Magnetic Catches: One catch on cabinet doors up to 48 inches high; two catches (top and bottom) on cabinet doors over 48 inches high.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Scheduling: Coordinate placement of blocking and reinforcement in walls supporting casework.

B. Environmental Requirements: Relative humidity 50% or less; temperature 70 degrees F minimum.

C. Examination: Examine conditions of work in place before beginning work; report defects. Verify the placement of plumbing and electrical service required by built-in equipment and accessories shown.
D. Measurements: Take field measurements prior to fabrication; report variance between plan and field dimensions.
E. Delivery: Use clean, nonstaining materials for blocking and packing. Carefully load and cover for shipment; do not transport during inclement weather.

3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified. Provide WI Certified Compliance Certificate for Installation.
B. Casework:
1. General: Install level, with tight joints between units; scribe edges to fit adjacent structure. Use concealed joint fasteners to align and secure adjoining cabinet units, counter tops and support brackets. Secure to blocking or plates in wall or to casework carriers with lag bolts with washers to permit removal; screw penetration of not less than 1 inch into 2 inch nominal blocking or framing is required.
2. Filler Panels: Scribe to cabinets and abutting structure.
C. Countertops:
1. General: Install level, using concealed fasteners, with tight joints; scribe to fit wall surfaces.
2. Solid Plastic: As shown, per Section 06 61 16 - PLASTIC PANEL FABRICATIONS.
3. Laboratory Countertops: Install per Architectural Woodwork Standards (AWS), Section 11 - Countertops.
D. Hardware:
1. General: Check hardware upon delivery to site; store in an orderly manner. Fit and install in place without marring or injuring either hardware or casework.
2. Seismic Restraint: As shown.

3.3 ADJUSTMENT: Prior to acceptance, adjust moveable parts to assure smooth operation.

3.4 CLEANING: Immediately following installation, clean casework to remove dirt, stains, scratches, and abrasions. Protect casework against damage by other trades; repair or replace damaged and defaced material at no cost to Owner.

3.5 JOBBING: Six (6) months after final acceptance of the building, and at any time within a year after acceptance when so directed, examine casework doors, drawers, fittings, etc., and perform such fitting and adjustment as necessary to put items in good condition and working order.

* * *

Section 06 61 16
PLASTIC PANEL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY: Provide Plastic Panel Fabrications, as shown and specified per Contract Documents.

1.2 REFERENCES:
- A. American National Standards Institute (ANSI): Standards.
- B. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
- C. International Surface Fabricators Association (ISFA): ISSFA-2 Classifications and Standards for Solid Surfacing Materials
- D. National Electrical Manufacturers Association (NEMA): Standards.
- E. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS)

1.3 SUBMITTALS:
- A. General: Submit product data and samples.
- B. Shop Drawings: Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures and accessories.
- C. Closeout: Submit guarantee in required form for a period of one (1) year from date of final acceptance by Owner.
- D. Maintenance Data: Manufacturer's instructions; provide maintenance kit for matte finishes.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:
- A. Solid Surfacing Material:
  1. General: Corian Endura manufactured by the DuPont Corian Solid Surfaces, matte finish exposed surfaces; thickness, edge treatments and size as shown..
  2. Alternate Manufacturers: No known equal.
  3. Adhesive: Manufacturer's standard.
  4. Fasteners: As recommended by manufacturer; refer to Section 06 05 00 - COMMON WORK RESULTS FOR WOOD, PLASTICS AND COMPOSITES.
- B. Sealant: Refer to Section 07 92 10 - JOINT SEALERS.

2.2 FABRICATION:
- A. General: Shop fabricate to shapes and sizes shown.
- B. Finish: Matte finish applied to all exposed surfaces
- C. Cutouts and Holes: Prepare for installation of plumbing fixtures as shown; refer to Division 22 - PLUMBING.

PART 3 - EXECUTION

3.1 PREPARATION:
- A. Examination: Examine conditions of work in place before beginning work; report defects.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Delivery: Deliver no components to project site until areas are ready for installation; store indoors.
- D. Protection: Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of Project.

3.2 INSTALLATION:
- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Components:
  1. General: Install plumb, level and rigid, scribe to surfaces using adhesive in color to match countertop, form seams to comply with manufacturer's instructions. Carefully dress joints smooth; remove surface scratches.
  2. Tolerances:
     - a. Variation in Component Size: +1/8 inch.
     - b. Location of Openings: ±1/8 inch from indicated location.
- C. Plumbing Fixtures and Connections: Refer to Division 22 - PLUMBING.

* * *

Section 06 83 16
FIBERGLASS REINFORCED PANELS

PART 1 - GENERAL
1.1 SUMMARY: Provide Fiberglass Reinforced Panels, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.
1.3 SUBMITTALS:
A. General: Submit product data, shop drawings, color and texture samples.
B. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. F.R.P. (Fiberglass Reinforced Polyester) Panels:
1. General: Standard FRP Panels with pebbled gloss finish manufactured by the Marlite Corp.; ASTM E84, Class 1/A flame spread of 25 and smoke generation of 450, maximum; color as selected by the Architect.
2. Alternate Manufacturers: Comparable products manufactured by Glasteel, Inc., or accepted equal.
3. Moldings and Trim: Manufacturer's standard Inside Corner, Outside Corner, Division and Edge Aluminum trim as required for condition as shown.
4. Base: Manufacturer's standard base molding with joint connectors, caps and corners as required; color as selected by the Architect.
5. Adhesive and Sealant: As recommended by the manufacturer for substrate shown.
B. Fasteners: Concealed type as recommended by the manufacturer; refer to Section 06 05 00 - COMMON WORK RESULTS FOR WOOD, PLASTICS AND COMPOSITES.

PART 3 - EXECUTION
3.1 PREPARATION:
A. Environmental Requirements: Relative humidity of 50% or less; minimum temperature of 70 degrees F.
B. Examination: Examine conditions of work in place before beginning work; report defects.
C. Measurements:
1. General: Take field measurements; report variance between plan and field dimensions.
2. Stud Spacing: Verify that backing is installed as required.
D. Product Handling: Deliver F.R.P. Panels flat, on skids; store inside, out of weather and exposure to sunlight. Re-stack panels 24 hours prior to installation, on solid flat surface to minimize package distortion.
3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. F.R.P. Panels:
1. General: Adhesive apply per manufacturer's instructions; apply sealant as required.
2. Moldings and Trim: Install as shown.
3. Base: Install as shown.

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Division 07 - THERMAL & MOISTURE PROTECTION

Section 07 21 00
THERMAL INSULATION

PART 1 - GENERAL
1.1 SUMMARY:
A. General: Provide Thermal Insulation, as shown and specified per Contract Documents.
B. Types: Batt insulation.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. North American Insulation Manufacturers Association (NAIMA): Manufacturing standards.
C. Underwriters Laboratories, Inc. (UL): UL 723 - Tests for Surface Burning Characteristics of Building Materials.
D. California Building Code (CBC): Standard 8-1.
1.3 SUBMITTALS:
A. General: Submit product data, samples, and certification that insulating materials comply with California Quality Standards for insulating materials.
B. Closeout: Submit maintenance data and required form for a period of one (1) year from date of final acceptance by Owner.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Manufacture:
1. General: Products are manufactured by Owens Corning, unless otherwise noted.
2. Alternate Manufacturers: Comparable products manufactured by the Johns-Manville Corp., or accepted equal.
3. Thickness: As shown; where not shown, as needed to meet CBC requirements.
B. Batt Insulation:
1. General:
a. Thermal: R-19 Ecotouch and R-30 Ecotouch Pink Fiberglass Insulation, unfaced; ASTM C665 Type I; ASTM E84, flame spread 10, smoke developed 10; kraft-faced; ASTM C665 Type II, Class C where shown.
b. Fire Rated: Echotouch Flame Spread 25 Insulation, FSK-faced; ASTM C665, Type III, Class A; ASTM E84 flame spread of 25, smoke developed of 50.
2. Suspended Ceilings: Sonobatts, unfaced; ASTM C665 Type I; ASTM E84, flame spread 10, smoke developed 10.
C. Vapor Barrier Membrane: 10 mil plastic sheet; FS L-P-377B.
D. Fasteners:
1. Mechanical:
a. General: As recommended by manufacturer, for application as shown.
b. Staples: 7/16 inch wire staples.
c. Nails: 11 gage, barbed, galvanized; 5/8 inch diameter heads.
2. Wire:
a. General: 16 or 18 gage steel.
b. Supports: As recommended by manufacturer.
3. Adhesive: As recommended by manufacturer.
4. Tape: As recommended by manufacturer, for application shown.
E. Sealants: Per Section 07 92 10 - JOINT SEALERS.

PART 3 - EXECUTION
3.1 PREPARATION: Examine conditions of work in place before beginning work; report defects.
3.2 INSTALLATION:
A. General: Install at exterior walls; ceilings below roof areas, where shown; and other locations, including above suspended ceilings, in strict conformance with referenced standards, the manufacturer's written directions, and as shown. Install wall and ceiling insulation to create complete thermal enclosure around habitable space.

B. Batt Insulation:
   1. Ceilings:
      a. General: Install with friction fit at sides and firmly butted ends without gaps or voids.
      b. Joists:
         1. General: Staple to joists at 4 inches on center; minimize air leaks.
         2. Wire-up Fastening System: Wire and supports as recommended by manufacturer.
      c. Suspended Ceilings: Place on top of suspended ceiling materials, excluding light fixtures. Fit snugly between ceiling supports and at edges and ends to minimize air leaks; extend 12 inches beyond wall lines of rooms to be insulated. Where walls or plenum barriers extend above ceiling, place 12 inch width of batt on opposite side, adjacent to wall or plenum barrier.
   2. Stud Walls: Install with friction fit at sides and firmly butted ends without gaps or voids; attach faced insulation to studs at 4 inches on center; minimize air leaks.
C. Vapor Barrier Membrane: Staple to exterior framing; lap sheets 4 inches minimum; seal membrane at door and window openings with caulking as specified under Section 07 92 10 - JOINT SEALERS.

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Section 07 41 13
METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY: Provide Metal Roof Panels, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.

B. National Roofing Contractors Association (NRCA):

1. General: NRCA Waterproofing Manual and Roofing Manual.
2. Metal Roof Panels: NRCA Roofing Manual - Metal Panel and SPF Systems.

C. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual.

D. The Society for Protective Coatings formerly Steel Structures Painting Council (SSPC): Standards.

E. Underwriters Laboratories (UL):

1. General: Fire Resistance Directory and Building Material Directory.
2. UL 997: Wind Uplift Standards.
3. UL 580: Tests for Wind Uplift Resistance of Roof Assemblies.

1.3 SUBMITTALS:

A. General: Submit product data, shop drawings and samples.

B. Closeout: Submit maintenance data and guarantee in required form for a period of twenty (25) years from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Metal Roof Panels:

1. General: PBR-Panel roof and fire wall panels as manufactured by Metal Sales Manufacturing Corp.
2. Alternate Manufacturers: Comparable products manufactured by AEP-Span, Inc., Division of ACS Profiles, or accepted equal.
3. Fire Rating: UL Class "A" fire retardant.
4. Panel System: 24 gage steel; longest practical length.
5. Accessories: Manufacturer's standard, as shown.
6. Finish: Factory applied fluoropolymer paint system; color as selected by Architect.
7. Fasteners: Corrosion resistant per CBC Standard No. 25-17; exposed fasteners finished to match panel finish.

B. Underlayment: Self sealing underlayment as recomended by the manufacturer.

C. Flashings:

1. General: As shown, same gage and finish as roofing material.
2. Penetration Flashings: As recommended by roofing manufacturer.

D. Plastic Cement: ASTM D2822, asphalt type.

E. Sealant: Refer to Section 07 92 10 - JOINT SEALERS.

F. Asphaltic Paint: Cold-applied asphalt mastic per SSPC requirements.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Examination: Examine conditions of work in place before beginning work; report defects.

B. Protection: Protect panels from contact with lime, cement or chemicals. Do not allow traffic or material storage on completed roof surface.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Self Sealing Underlayment: Install as recomended by manufacturer and where shown.

C. Flashings: Install as shown.

D. Panels:
   1. General: Install plumb, straight, square and level; at proper elevations, locations and in alignment with adjacent work. Attach panels with fully concealed galvanized steel anchor clips. No perforation of panels by anchoring fasteners is allowed, except as shown or necessary for flashing and trim members. Tightly close interlocking seam between panels. Finish panels clean, securely fastened to structure, and weathertight. Work showing dents, creases, deformations, weathering or other defects affecting use or appearance will not be accepted.
   2. Accessories: Install where required and as shown.
   3. Penetrations: Seal pipes, vents, etc., penetrating the roofing material with sleeves and flanges of the type and size to provide a waterproof installation.
   4. Dissimilar Metals: Coat with asphaltic paint; 7-1/2 mil thickness, minimum, each surface.

E. Expansion and Contraction: Allow for expansion and contraction over an ambient temperature range up to 150 degrees F; distortions resulting from fastening or expansion and contraction stresses are not acceptable

F. Sealant: Apply as required to provide watertight installation per Section 07 92 10 - JOINT SEALERS.

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Section 07 42 13
METAL WALL PANELS

PART 1 - GENERAL
1.1 SUMMARY: Provide Metal Wall Panels, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual.
C. The Society for Protective Coatings formerly Steel Structures Painting Council (SSPC): Standards.
D. Underwriters Laboratories (UL): Fire Resistance Directory and Building Material Directory.
1.3 SUBMITTALS:
A. General: Submit product data, shop drawings and samples.
B. Closeout: Submit maintenance data and guarantee in required form for a period of two (2) years from date of final acceptance by Owner.
1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Metal Wall Panels:
1. General: IC72 - Wall Panel manufactured by Metal Sales Manufacturing Corp..
2. Alternate Manufacturers: Comparable products manufactured by AEP-Span, Inc., Division of ACS Profiles, or accepted equal.
3. Accessories: Manufacturer's standard, as shown.
4. Finish: Factory applied fluoropolymer finish; color as selected by Architect.
5. Fasteners: Corrosion resistant; exposed fasteners finished to match panel finish.
B. Sealant: Refer to Section 07 92 10 - JOINT SEALERS.
C. Asphaltic Paint: Cold-applied asphalt mastic per SSPC requirements.

PART 3 - EXECUTION
3.1 PREPARATION:
A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.
3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Panels:
1. General: Install plumb, straight, square and level; at proper elevations, locations and in alignment with adjacent work. Attach panels as shown. No perforation of panels by anchoring fasteners is allowed, except as shown or necessary for flashing and trim members. Tightly close interlocking seam between panels. Finish panels clean, securely fastened to structure, and weathertight. Work showing dents, creases, deformations, weathering or other defects affecting use or appearance will not be accepted.
2. Accessories: Install where required and as shown.
C. Expansion and Contraction: Allow for expansion and contraction over an ambient temperature range up to 150 degrees F; distortions resulting from fastening or expansion and contraction stresses are not acceptable.
D. Sealant: Apply as required to provide watertight installation per Section 07 92 10 - JOINT SEALERS.

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Section 07 92 10
JOINT SEALERS

PART 1 - GENERAL
1.1 SUMMARY: Provide Joint Sealers, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM):
1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
2. ASTM C1021: Standard Practice for Laboratories Engaged in Testing of Building Sealants.
3. ASTM C1193: Standard Guide for Use of Joint Sealants.
4. ASTM C1472: Standard Guide for Calculating Movement and Other Effects When Establishing Sealant Joint Width.
B. Sealant, Waterproofing and Restoration Institute (SWRI):
1. General: Sealants: The Professional's Guide.
2. Product Validation: SRWI Liquid Sealant Validation Program.
C. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.
1.3 SUBMITTALS:
A. General: Submit product data, samples, and certification that sealants proposed for use comply with the Contract Documents.
B. Certifications: Submit SWRI Liquid Sealant Validation for all liquid products.
C. Closeout: Submit maintenance data and guarantee in required form for a period of ten (10) years from date of final acceptance by Owner.
1.4 QUALITY ASSURANCE:
A. Qualifications:
1. General: The manufacturer of the sealant used shall have been in the business of manufacturing the specified types of such sealants for not less than 10 years.
2. Applicator: Installer specializing in the work of this Section with minimum five (5) years documented experience.
3. Volatile Organic Compounds (VOC): Use only products in compliance with VOC content limits required by Federal and State EPA regulations.
B. Compatibility with Substrate: Verify that calking and sealants used are compatible with joint materials.
C. Joint Tolerances: Comply with manufacturer's joint width/depth ratio limitations.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Joint Sealers:
1. General: Manufactured by Tremco, Inc.
2. Alternate Manufacturers: Comparable products manufactured by the Pecora Chemical Corp., or accepted equal.
3. Color:
a. Concealed Joints: Manufacturer's standard color as selected by the Architect having best overall performance characteristics for indicated application.
b. Exposed Joints: Custom color selected by Architect.
B. Exterior Joints:
1. Vertical Surfaces: Non-sag polyurethane; Dymonic FC.
2. Butyl Preformed Sealing Tape: Tremco 440 Tape.
C. Interior Joints:
1. General: Acrylic Latex, TremGlaze SA1100.
2. Ceramic Tile and Plumbing Fixture Joints: Proglaze silicone rubber.
3. Sound Transmission: Tremco Acoustical Sealant.
4. Firestop Caulking: TremStop Firestopping System.
D. Joint Cleaner: Provide cleaner recommended by sealant manufacturer for specific joint surface and condition.
E. Joint Primer and Sealer: Non-corrosive and non-staining type as recommended by sealant manufacturer for each condition.
F. Joint Backing: Round, open cell non-gassing polyurethane foam rod or closed cell polyethylene foam as recommended by the manufacturer, oversized 30 percent larger than joint width.

G. Bond Breaker: Pressure sensitive tape as recommended by sealant manufacturer to suit application.
H. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
I. Other Materials: Manufacturer's standard for items required or type best suited for proper execution of the work.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements: Do not apply materials when temperature is below 40 degrees F, or under extreme temperature conditions when joint width is expanded or contracted beyond normal conditions.
B. Examination:
1. General: Carefully examine before beginning work; report defects.
2. Substrate: Inspect surfaces to ensure that no previously installed bond-breaker materials contaminate the surface to which the sealant is to adhere. Require repair of unsound substrates. Commencement of work constitutes acceptance of substrate.
C. Storage: Per manufacturer's recommendations for proper precautions for shelf life, temperature, humidity and similar storage factors to ensure the fitness of the material when installed.
D. Surface Preparation:
1. General: Prepare joints in accordance with manufacturer's instructions to ensure maximum adhesion. Remove loose materials and foreign matter that might impair adhesion of sealant.
2. Masking: Tape as required to prevent contact of sealant with adjoining surfaces to prevent permanent staining, damage by contact, or by cleaning methods required to remove sealant smears.
3. Sealants: Prepare as required, including proper mixing of multi-component sealants.
E. Protection: Protect surfaces adjacent to joints to receive sealant. Cover joints in walking surfaces with heavy duty, non-staining tape, until material has dried.

3.2 APPLICATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Joints: Review joint size and movement per ASTM C1472.
C. Installation:
1. General: Comply with ASTM C1193 and the manufacturer's instructions, within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within recommended ranges.
2. Joint Cleaner: Apply per manufacturer’s instructions.
3. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.
4. Primer: Apply as required; protect adjacent exposed surfaces.
5. Backing: Install to achieve a neck dimension no greater than 1/3 of the joint width, unless otherwise shown. Use blunt or rounded tools to ensure uniform (+ or - 1/8 inch) depth without puncturing material. Use oversize backer rod; minimum of 33% for closed cell type; minimum of 50 percent for open cell type, unless otherwise required by the manufacturer.
6. Bond Breaker: Install where joint backing is not used.
7. Sealant:
a. General: Install free of air pockets, foreign embedded matter, ridges, and sags; prevent three sided adhesion. Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios, unless otherwise noted. Provide sealant depth of one half (1/2) joint width; minimum depth of 1/4 inch; maximum of 1/2 inch, unless otherwise required by the manufacturer.
b. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants joint with slightly concave surface, compressing sealant into joint to form smooth, uniform sealant bead; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
8. Sound Transmission: Comply with ASTM C919 and manufacturer’s instructions to obtain STC Values shown.
9. Firestopping: Apply as required to comply with fire ratings shown.

10. Masking: Remove tape immediately after tooling without disturbing joint seal.

3.3 CLEANING:

A. General: Clean off excess sealant or sealant smears as sealant Work progresses per manufacturer's instructions. Exercise care to avoid scratching or damage to surfaces. Repair surfaces stained, marred, or otherwise damaged during sealant Work.

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Division 08 - OPENINGS

Section 08 11 10
STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY: Provide Steel Doors and Frames, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Architectural Manufacturers Association (AAMA): AAMA907 - Voluntary Specification for Corrosion Resistant Coatings on Carbon Steel Components Used in Windows, Doors and Skylights.

B. American Society for Testing and Materials (ASTM):
   1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
   2. ASTM E1105: Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
   3. ASTM E2112: Standard Practice for Installation of Exterior Windows, Doors and Skylights.

C. American National Standards Institute (ANSI):
   1. ANSI A117.1: Accessible and Usable Buildings and Facilities.
   2. ANSI A250.8: Recommended Specifications for Standard Steel Doors and Frames.

D. Americans with Disabilities Act (ADA):
   1. General: Americans with Disabilities Act of 1990, ADA - 42 U.S. Code Chapter 126.
   2. ADA Standards for Accessible Design: U.S. Department of Justice, 28 CFR Part 36.

E. Door Hardware Institute (DHI): Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

F. Intertek Testing Services (ITS): Certification listings for fire doors.

G. National Fire Protection Association (NFPA): NFPA 80: Standard for Fire Doors and Other Opening Protectives.

H. Steel Door Institute (SDI):
   1. ANSI/SDI-250.6: Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
   2. ANSI/SDI-250.8: Recommended Specification for Standard Steel Doors and Frames
   3. ANSI/SDI-250.11: Recommended Erection Instructions for Steel Frames.

I. Underwriters Laboratories, Inc. (UL): UL 10C - Positive Pressure Fire Tests of Door Assemblies.

1.3 SUBMITTALS:

A. General: Submit product data, and samples.

B. Shop Drawings: Show details of each condition shown at 3 inch scale.

C. Test Reports: Refer to Section 01 45 23 - TESTING AND INSPECTION SERVICES.

D. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE:

A. Labeled Doors and Frames: Conform to requirements of State Fire Marshal and Underwriters Laboratory.

B. Design Requirements: Exterior glazed frame members designed to withstand a wind load of 24 lbs. per square foot, minimum.

C. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Steel:
   1. Sheet: ASTM A1008 and ASTM A1011, uncoated, pickled, and free from pits and defects. Use cold-rolled or hot-rolled for frames; stretcher-leveled for 18 gage and lighter.
   2. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A653, commercial quality.
   3. Reinforcement: ASTM A36.

B. Fasteners:
   1. General: Galvanized or cadmium plated.
   2. Bolts and Nuts: ASTM A307, Grade A.
   3. Machine Screws: FS FF-S-92, Type III cross-recessed, Design I or II recess, Style 2c flat head; carbon steel.
C. Silencers: Resilient rubber; manufacturer's standard.
D. Sealant: Refer to Section 07 92 10 - JOINT SEALERS.
E. Primer: Refer to Section 09 91 00 - PAINTING.

2.2 MANUFACTURE:
A. General: Specified products are manufactured by Ceco Door Products, a Division of Assa Abloy, unless otherwise noted.
B. Alternate Manufacturers: Comparable products manufactured by Steelcraft, a Division of Ingersol Rand, or accepted equal.
C. Knockdown Frames:
   1. General: “S” (Standard) Series manufactured by Timely Industries.
   2. Alternate Manufacturers: Comparable products manufactured by the Ceco Door Products, or accepted equal.
D. Hardware Requirements: Prepare doors and frames at factory to receive template hardware per final schedule; locate as specified under Section 08 71 00 - DOOR HARDWARE. Provide reinforcements of specified thicknesses and sizes recommended by hardware manufacturer; hinge reinforcements not less than 7 gage and at least 9 inches long; mortised and countersunk items not less than 12 gage; surface applied items not less than 14 gage; other reinforcing per ANSI A250.6.
E. Metal Doors:
   1. General: Exterior (Thermally Broken): SDI-100 Level II, Model 2.
   2. Door Construction:
      a. Face: Steel sheet in accordance with ANSI A250.8.
      b. Core:
         1. Unrated: Manufacturer's standard.
         2. Thermal Insulated: Total insulation R value of 11, measured in accordance with ASTM C1363 under ASTM C1199.
F. Metal Frames:
   1. Exterior: 16 gage; 14 gage for frames **over** 3'-0" wide.
   2. Interior Frames: 18 gage; 16 gage for frames **over** 3'-0" wide or fire rated.
G. Finish: Baked primer.

2.3 FABRICATION:
A. Metal Doors:
   1. General: Fabricate to sizes and shapes shown.
   2. Flush Doors: Fabricate doors with hardware reinforcement welded in place. Close top and bottom edge of exterior doors with flush end closure. Seal joints watertight.
   3. Door Clearances: Provide 1/8 inch maximum clearance at jambs, heads, and meeting stiles; threshold clearances as specified under Section 08 71 00 - DOOR HARDWARE.
   4. Electrical Requirements: Make provisions for installation of electrical items specified under Section 08 71 00 - DOOR HARDWARE and other applicable Sections.
B. Metal Frames:
   1. Standard Frames: Fabricate frames as welded unit.
   2. Knock Down Frames: For field assembly.
   3. Drywall Frames: Drywall slip-on type.
   4. Reinforcement:
      a. General: Reinforce frames wider than 48 inches with roll-formed steel channels fitted tightly into frame head, flush with top.
      b. Hardware: Fabricate frames with reinforcing plates welded in place. Provide mortar guard boxes, where required.
   5. Silencers: Single door, provide three (3) single silencers equally spaced on strike side.
C. Anchors:
   1. General: Fabricate 16 gage x 2 inch wide anchors of same material used for door frames.
   2. Metal Stud Partitions: Metal stud type anchors.

PART 3 - EXECUTION

3.1 PREPARATION:
- A. Examination: Examine conditions of work in place before beginning work; report defects.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Protect metal surfaces after installation; any indication of deterioration, use or damage will be unacceptable.

3.2 INSTALLATION:
- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Anchors:
  1. Jambs:
     - a. General: Position one (1) anchor above top butt reinforcement and one (1) anchor below bottom butt reinforcement; minimum four (4) anchors per door jamb, 24 inches on center maximum.
     - b. Frames Set in Metal Stud Partitions:
       1. General: Weld to frames and studs.
       2. Metal Studs: Fasten to studs with sheet metal screws; anchor per manufacturer's recommendations.
  2. Head: Provide minimum of two (2) anchors at frames over 2'-6" wide; 24 inches on center, maximum.
- C. Metal Frames:
  1. General: Set frames plumb, straight and square per ANSI/SDI-250.11; align and securely brace until permanent anchors are set; use shims where required. Remove temporary braces after wall construction is completed.
  2. Door Frames:
     - a. Standard Frames: Where shown, provide overhead frame bracing; securely anchor to structure. Install roll-formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
     - b. Fire Rated Frames: Install per NFPA 80.
     - c. Knock Down Frames: As shown; per manufacturer's instructions.
  3. Sealant: Seal perimeter of frames and adjoining material per Section 07 92 10 - JOINT SEALERS.
- D. Metal Doors:
  1. General: Match doors into their respective frames as shown, per ANSI/SDI-250.8; install plumb, straight and square.
  2. Hardware: Refer to Section 08 71 00 - DOOR HARDWARE.
  3. Maximum Diagonal Distortion: 1/8 inch measured with straight-edge, corner to corner.
- E. Finish: Touch-up factory applied baked primer; refer to Section 09 91 00 - PAINTING.

3.3 ADJUSTMENT: Prior to acceptance, adjust moveable parts to assure smooth operation.

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Section 08 14 16
FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY: Provide Flush Wood Doors, as shown and specified per Contract Documents.

1.2 REFERENCES:
- A. Door Hardware Institute (DHI): DHI A115-W Series Standards.
- B. Intertek Testing Services (ITS): Certification listings for fire doors.
- C. National Fire Protection Association (NFPA):
  1. NFPA 80: Standard for Fire Doors and Other Opening Protectives.
  2. NFPA 252: Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
- D. Underwriters Laboratories, Inc. (UL): UL 10C - Fire Tests of Door Assemblies.
- E. Window and Door Manufacturers Association (WDMA): WDMA I.S. 1A: Architectural Wood Flush Doors.
- F. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS), Section 9 - Doors.

1.3 SUBMITTALS:
- A. General: Submit product data and samples.
- B. Shop Drawings: Indicate location, size, and hand of each oor, elevation of each kind of door, construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
  1. Indicate dimensions and locations of mortises and holes for hardware.
  2. Indicate dimensions and locations of cutouts.
- C. Certificates: Submit WI Certified Compliance Certificate for Installation.
- D. Closeout:
  1. General: Submit maintenance data.
  2. Guarantee:
     a. General: Submit in required form.
     b. Interior Doors: For life of installation

1.4 QUALITY ASSURANCE:
- A. General: Obtain wood doors from single manufacturer.
- B. Labeled Doors: Conform to requirements of State Fire Marshal Standard 12-7-4 and Underwriters Laboratory for labeled wood doors in fire-rated openings.
- C. Testing: One (1) or more doors, of each type, may be selected at random from those delivered for testing. Those tested or cut apart will be used to determine compliance with specified requirements; noncompliance is basis for rejection of all of that kind and type of door delivered to the site. Acceptable doors used for testing will be replaced at Owner's expense.
- D. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:
- A. Flush Wood Doors:
  1. General: Conform to Custom Grade standards, per Architectural Woodwork Standards (AWS), Section 9 - Doors.
  2. Manufacture:
     a. General: Aspiro Series Wood Veneer Doors manufactured by Masonite Architectural.
     b. Alternate Manufacturers: Comparable products manufactured by Eggers Industries, or accepted equal.
  3. Flush Type:
     a. Interior: 1-3/4 inch thick, solid core.
        1. Construction: Unrated and 20 minute Particleboard.
        2. Edge-bands: WDMA hardwood.
        3. Facing: Paint grade closed grain hardwood.
        4. Adhesive: PS 51 Type I and II.
- B. Finish: Per Section 09 91 00 - PAINTING.

C. Hardware Requirements: Prepare doors at factory to receive template hardware per final schedule; locate as specified under Section 08 71 00 - DOOR HARDWARE. Provide reinforcements of specified thicknesses and sizes recommended by hardware manufacturer and per ANSI A250.6.

2.2 FABRICATION:

A. General: Factory fit doors to suit frame opening size indicated; comply with clearance requirements.
B. Hardware: Factory machine doors per DHI A115-W Series Standards, and hardware templates for hardware that is not surface applied. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
C. Electrical Raceways: Provide flush wood doors receiving electrified hardware with concealed wiring harness and standardized plug connectors. Coordinate connectors specified in hardware sets in Section 08 71 00 - DOOR HARDWARE.
D. Finishing: Shop prime doors with one coat of wood primer specified in 09 91 00 - PAINTING. Seal all four edges, edges of cutouts and mortises with primer.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
B. Examination: Examine conditions of work in place before beginning work; report defects. Verify that door frames are the type required for door and are properly installed. Install fire rated doors only in corresponding fire rated frames.
C. Measurements: Take field measurements; report variance between plan and field dimensions.
D. Delivery:
   1. General: Pack and protect doors against damage during shipment and storage. Do not use packing materials that will stain or discolor door surface.
   2. Storage: Per WI Technical Bulletin No. 420-R for flush doors and No. 416-R for fire rated doors. Store materials under cover, in heated rooms and protected from damage, including exposure to excess humidity.

3.2 INSTALLATION:

A. General: Install in strict conformance with CBC, other referenced standards, the manufacturer's written directions, as shown, and as herein specified. Make manufacturer's instructions available to the inspecting authorities.
B. Door Types: Install where shown; install fire rated doors in corresponding fire rated frames.
C. Clearances:
   1. General: Align and fit doors in frames with uniform clearances and bevels.
   2. Head, Jamb and between Pairs of Doors: 1/8 inch.
   3. Bottom:
      a. General: 1/8 inch from door bottom to top of finish floor.
      b. Thresholds: 1/4 inch from door bottom to top of threshold.
   4. Fire-rated Doors: Per NFPA 80.
D. Tolerances:
   1. General: Maximum distortion measured with straight edge or taut string, corner to corner, over an imaginary 36 inch x 84 inch surface area.
   2. Diagonal (Warp), Vertical (Bow) and Width (Cup): 1/16 inch in width; 1/8 inch in height.
   3. Telegraphing of Core Construction in Face Veneers: Not to exceed 0.01 inch in a 3-inch span.
E. Hardware: Per Section 08 71 00 - DOOR HARDWARE. Machine doors for hardware; seal cut surfaces after fitting and machining. Do not trim job fitted doors more than 1/4 inch from any edge.
F. Glazing: Per Section 08 81 00 - GLASS GLAZING.
G. Finishing: Repair, refinish, or replace factory-finished doors damaged during installation, as directed by Architect.

3.3 ADJUSTMENT: Prior to acceptance, adjust moveable parts to assure smooth operation.

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Section 08 33 23
OVERHEAD COILING DOORS

PART 1 - GENERAL:
1.1 SUMMARY: Provide Overhead Coiling Doors, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. National Electrical Manufacturers Association (NEMA):
1. NEMA 250: Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA ICS 2: Standards for Industrial Control Devices, Controllers and Assemblies.
3. NEMA MG1: Motors and Generators.
C. National Fire Protection Association (NFPA): NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
1.3 SUBMITTALS:
A. General: Submit product data, shop drawings and samples.
B. Certificates: UL Certificate of Inspection for fire rated doors exceeding UL listed sizes.
C. Closeout: Submit maintenance data and guarantee in required form for a period of two (2) year from date of final acceptance by Owner.
1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience; manufacturer approved.

PART 2 - PRODUCTS:
2.1 MATERIALS:
A. Overhead Coiling Door:
1. General: Rolling Service and Fire Doors manufactured by the Overhead Door Corp.; size as shown.
2. Alternate Manufacturers: Comparable products manufactured by the Cookson Co., or accepted equal.
3. Fire Rated: Fire Doors - Model 630; comply with UL label for "Leakage Rated Assembly" or "S" label.
4. Curtain:
a. Slats: Curved profile, Type C-187, 20 gage galvanized steel.
b. Bottom Bar: Manufacturer's standard with weatherstrip; provide sloping bottom bar where required; match grade contour.
c. Windlocks: Provide on exterior doors over 14'-0" wide.
5. Finish: Galvanized and primed steel, ready for field painting.
B. Operators:
1. General: Manufacturer's standard; locks and cylinders provided under Section 08 71 00 - DOOR HARDWARE.
2. Push-Up: Handle in curtain with lockable latch mounted on each guide.
3. Power:
a. General: Provide with NEMA 1 motor controller and overcurrent protection. Provide curtain with safety device mounted on bottom bar and emergency crank operation.
b. Motor: Model No. RSXOperator, 1 hp.
c. Door Controls:
1. Exterior: Flush mounted keyed switch; open/close station, momentary contact.
2. Interior: Manufacturer's standard flush mounted three (3) button station with key operated on/off switch.
3. Audible and Visual Signals: Provide audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility.
C. Fasteners: As recommended by manufacturer; tamper proof type; anchors as shown.
D. Sealant: Refer to Section 07 92 10 - JOINT SEALERS.

PART 3 - EXECUTION:
3.1 PREPARATION:
A. Scheduling: Coordinate installation of bolts or other anchors built into concrete or masonry and identify exact location for installation.
B. Examination: Examine conditions of work in place before beginning work; report defects.

C. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Overhead Coiling Door:

1. General: Set work plumb and true; properly assemble and erect in a rigid manner. Anchor assembly to building framing without distortion or stress; securely brace components suspended from structure. Fit and align assembly including hardware to provide smooth operation.
2. Hardware: Install door operators per manufacturer's instructions; locks per Section 08 71 00 - DOOR HARDWARE.
3. Tolerances: Maintain dimensional tolerances and alignment with adjacent work; maximum variation from plumb or level of 1/16 inch and maximum longitudinal or diagonal warp of plus or minus 1/8 inch per 10'-0" straight edge.
4. Door Controls: Install where shown; coordinate installation of electrical service with Division 26 - ELECTRICAL. Complete wiring from disconnect to unit components and from fire alarm system to door.

C. Sealants: As shown; refer to Section 07 92 10 - JOINT SEALERS.

D. Adjustment: Prior to acceptance, adjust release devices and moveable parts and test to assure smooth and quiet operation.

E. Cleaning: Remove labels and touch-up and repair visible markings. Clean curtain and components using non-abrasive materials.

3.3 FIELD QUALITY CONTROL: After installation, demonstrate that each door operates properly and that special features function within requirements. Perform functional testing of fire door assemblies with IDEA Certified personnel.

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Section 08 51 13
ALUMINUM WINDOWS

PART 1 - GENERAL
1.1 SUMMARY: Provide Aluminum Windows, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. Aluminum Association (AA): Standards.
B. Aluminum Anodizers Council (AAC): Standards.
C. American Architectural Manufacturers Association (AAMA):
1. AAMA 101: Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
2. AAMA 502: Standard method for field testing and verification of final window installation.
3. AAMA 603.8: Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum.
4. AAMA 605.2: Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
5. AAMA 611: Standards for Anodized Architectural Aluminum.
6. AAMA 1503.1: Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.
D. American Society for Testing and Materials (ASTM):
1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
2. ASTM E283: Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
3. ASTM E330: Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
4. ASTM E331: Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
5. ASTM E2112: Standard Practice for Installation of Exterior Windows, Doors and Skylights.
E. Glass Association of North America (GANA): Glazing Manual.
F. National Fenestration Rating Association (NFRA): NFRC 100 - Procedure for Determining Fenestration Product Thermal Properties (Currently Limited to U-Value).
G. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.
1.3 SUBMITTALS:
A. General: Submit product data, shop drawings and samples.
B. Certification: Apply a permanently installed "AAMA Prime and Replacement Label" to the window unit bearing the manufacturer's name, product series number, grade and class designations. Do not install label in exposed location.
C. Test Reports: Submit report by independent testing laboratory verifying that deflection, water resistance, air infiltration, fabrication workmanship, and torsion resistance of window meets requirements of ANSI/AAMA 101.
D. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.
1.4 QUALITY ASSURANCE:
A. Design Criteria:
1. General: ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
2. Requirements: Aluminum frame members must span vertically to withstand 25 psf wind load, minimum, per CBC; provide internal reinforcing as required; maximum deflection of L/175 of clear span or maximum of 3/4 inch.
B. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Aluminum Windows:
1. General: Manufactured by Milgard Windows.
2. Alternate Manufacturers: Comparable products manufactured by Blomberg Window Systems, or accepted equal; configuration and sizes as shown.
3. Horizontal Sliding: Thermally Improved - Horizontal Sliding Window.

4. Hardware: Manufacturer's standard.
5. Glass:
   a. General: As shown; refer to Section 08 81 00 - GLASS GLAZING
   b. Glazing: Manufacturer's standard.
6. Screens: At operable windows; 18/16 mesh fiberglass; in manufacturer's standard aluminum frame.
7. Finish: Color anodic; application process per AAMA 606.1; color as selected by the Architect.

B. Fasteners: As recommended by manufacturer; attachment of frame to structure shall withstand 25 lbs. per square foot wind load.
C. Sealant: As recommended by manufacturer and as specified under Section 07 92 10 - JOINT SEALERS. Match color to aluminum finish.
D. Protective Coating: Bituminous; conforming to FS TT-C-494.

PART 3 - EXECUTION

3.1 PREPARATION:
A. Environmental Requirements: Do not install sealants when temperature falls below 40 degrees F.
B. Examination: Examine conditions of work in place before beginning work; report defects.
C. Measurements: Take field measurements; report variance between plan and field dimensions.
D. Protection: Protect pre-finished surfaces with wrapping or stripable coating; do not use adhesive papers or sprayed coatings. Maintain labels and protect glass until final acceptance.

3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Attachment:
   1. General: Align window frame and glazing plumb and level; free of warp or twist. Attach window frame to perimeter opening in manner to accommodate construction tolerances and other irregularities; align with adjacent work.
   2. Tolerances: Maximum variation from level or plumb of 0.06 inches every 3'-0" non-cumulative or 0.5 inches per 100'-0", whichever is less.
C. Thermal Insulation: Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier. Coordinate attachment and seal of perimeter air and vapor barrier materials.
D. Hardware: Install per manufacturer's instructions.
E. Glass: Install glass in accordance with Section 08 81 00 - GLASS GLAZING.
F. Sealant: Install per Section 07 92 10 - JOINT SEALERS; apply as shown, make installation fully watertight.
G. Dissimilar Materials: Separate concealed aluminum surfaces in contact with ferrous metals, concrete, masonry or plaster with bituminous coating compound.

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Section 08 62 00
UNIT SKYLIGHTS

PART 1 - GENERAL
1.1 SUMMARY: Provide Unit Skylights, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Architectural Manufacturers Association (AAMA):
1. AAMA 605.2: Application Process for Thermosetting Acrylic Finish.
2. AAMA 606.1: Application of Color Anodic Finishes.
B. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
C. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.
1.3 SUBMITTALS:
A. General: Submit product data, shop drawings and samples.
B. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.
1.4 QUALITY ASSURANCE:
A. Qualifications:
1. General: Skylight unit California State Fire Marshal listed.
2. Installer: Specialized in performing the work of this Section with minimum three (3) years experience.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Unit Skylights:
1. General: Manufactured by Bristolite Skylights.
2. Alternate Manufacturers: Comparable products manufactured by American Skylites, Inc., or accepted equal.
3. Type: Thermally Broken: Bristol Model No. ALT-CM-2 Dome.
4. Size: As shown.
5. Glazing: Manufacturer's standard, with white inner lens.
6. Finish: Color anodic; application process per AAMA 606.1; color as selected by the Architect.
B. Fasteners: As shown.
C. Protective Coating: FS TT-C-494, Type II.
D. Sealant: Refer to Section 07 92 10 - JOINT SEALERS.

PART 3 - EXECUTION
3.1 PREPARATION:
A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.
3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Skylights: Install to established lines and levels; shim curb as required, anchor to structure and make watertight. Provide continuous bead of sealant between frame and curb.
C. Dissimilar Materials: Separate aluminum and other metals with specified protective coating.
3.3 FIELD QUALITY CONTROL:
A. General: Perform NAAMM Standard FC-1, Water Penetration Test after erection.
B. Retesting: Make necessary corrections to non-conforming work; retest at Contractor's expense.

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Section 08 71 00
DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY: Provide Door Hardware, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. Americans with Disabilities Act (ADA):
   1. General: Americans with Disabilities Act of 1990, ADA - 42 U.S. Code Chapter 126.
   2. ADA Standards for Accessible Design: U.S. Department of Justice, 28 CFR Part 36.

B. American National Standards Institute (ANSI): ANSI A117.1 and the California Code of Regulations, Title 24.

C. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers standard specifications.

D. Architectural Woodwork Institute (AWI): Quality standards.

E. Builders Hardware Manufacturers Association (BHMA): Hardware standards.

F. California Building Code (CBC): Hardware standards.

G. Door and Hardware Institute (DHI): Hardware installation standards.

H. National Fire Protection Association (NFPA): NFPA 252.

I. Underwriters Laboratories, Inc. (UL):
   1. UL 10B: Fire Test for Door Assemblies.
   2. UL 305: Panic Hardware.

J. Woodwork Institute (WI): Manual of Millwork.

1.3 SUBMITTALS:

A. General:
   1. General: Submit product data, test reports, certificates and as follows:
   2. Shop Drawings:
      a. General: Submit detailed finish hardware schedule in vertical format as follows:
      b. List groups and suffixes in proper sequence.
      c. Completely describe door and list architectural door number.
      d. Provide name of manufacturer, product name, catalog number, function, type, style, size and finish of each item.
      e. Show mounting locations.
      f. Explain abbreviations and symbols used in schedule.
      g. Provide detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment, and access control equipment, and door and frame rough-ins required for specific opening.
   3. Samples:
      a. General: If specifically requested for specified products; required for alternate products.
      b. Substitutions Requests: Refer to Section 01 25 00 - SUBSTITUTION PROCEDURES. Submit schedule and sample of each item proposed for substitution. Clearly mark each sample indicating type of item, manufacturer's name, catalog number and item for which it is proposed to be substituted.
      c. Disposition: Accepted samples may be used in work; rejected samples will be returned.

B. Closeout:
   1. Maintenance Data: Provide manufacturer's instructions and special maintenance tools and accessories as required. Provide three copies of the lock service manual.
   2. Guarantee:
      a. General: Provide in required form for a period of one (1) year from date of final acceptance by Owner and as follows:
      b. Manufacturer’s Warranty:
         1. Door Closers: Ten (10) years.
         2. Exit Devices: Three (3) years.
         3. Locksets and Cylinders: Three (3) years.
         4. All Other Hardware: Two (2) years.

1.4 QUALITY ASSURANCE:

A. Manufacturers: Specializing in production of institutional and commercial door hardware for a minimum of five (5) years.

B. Supplier:
   1. General: A firm specializing in the supply and servicing of institutional and commercial door hardware for at least five (5) years.

2. Personnel: Employ an Architectural Hardware Consultant (AHC or DAHC), accredited by the Door and Hardware Institute (DHI), to supervise detailing and supply of material for the Project. If requested, inspect final installation and report problems and suggested corrective measures to the Architect.

C. Coordination:
1. General: Apply hardware to aluminum or metal doors and frames, and factory prepared wood doors and frames, to template; provide two (2) copies of accepted Finish Hardware Schedule for use by door and frame suppliers.
2. Distribution: Furnish two (2) copies of each template to manufacturers who are not listed as current template book holders; furnish two (2) copies of each template for items whose manufacturers do not provide registered template book.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturers:

ITEM	1	2	3
Hinges	Hager	McKinney	Lawrence
Locks	Hager	Schlage	Best
MagLock	Securitron	(No Substitution)	
Cylinders	Hager	Schlage	Best
Exit Devices	Sargent	Von Duprin	Precision
Closers	Hager	LCN	Sargent
Floor Closer / Pivots	Rixson	(No Substitution)	
Coordinators	Hager	Rockwood	Trimco
Flush Bolts	Hager	Rockwood	DCI
Push/Pulls	Hager	Rockwood	Trimco
Kickplates	Hager	Rockwood	Trimco
Stops	Hager	Rockwood	Trimco
Overhead Stop/Holder	Rixson	Sargent	Glynn Johnson
Weatherstripping	Hager	Pemko	Reese
Door Gasketing	Hager	Pemko	Reese
Threshold	Hager	Pemko	Reese

2.2 HINGES:

A. Hinges, and electric hinges shall be of one manufacturer as listed for continuity and consideration of warranty.

B. Standards: Manufacturer to be certified by the following:
1. Hinges and Pivots: ANSI/BHMA A156.1
2. Template Hinge Dimensions: ANSI/BHMA A156.7
3. Finishes: ANSI/BHMA A156.18

C. Butt Hinges:
1. Hinge weight and size unless otherwise indicated in hardware sets:
a. Doors up to 36 inches wide and up to 1-3/4 inches thick provide hinges with a minimum thickness of .180 inch at exterior doors, and paired doors, .134 inch at interior doors and a minimum of 4-1/2 inches in height.
b. Doors from 36 inches wide up to 42 inches wide and up to 1-3/4 inches thick provide hinges with a minimum thickness of .190 inch and a minimum of 5 inches in height.
c. For doors from 42 inches wide up to 48 inches wide and up to 1-3/4 inches thick provide hinges with a minimum thickness of .190 inch and a minimum of 5 inches in height.
d. Doors greater than 1-3/4 inches thick provide hinges with a minimum thickness of .190 inch and a minimum of 5 inches in height.
e. Width of hinge is to be minimum required to clear surrounding trim.
2. Base material unless otherwise indicated in hardware sets:
a. Exterior Doors: 304 Stainless Steel material.
b. Interior Doors: Steel material.
c. Fire Rated Doors: Steel or 304 Stainless Steel materials.
3. Quantity of hinges per door:
a. Doors up to 60 inches in height shall have 2 hinges.
b. Doors 60 inches up to 90 inches in height shall have 3 hinges.
c. Doors 90 inches up to 120 inches in height shall have 4 hinges.
d. Doors over 120 inches in height add 1 additional hinge per each additional 30” in height.

4. Hinge design and options unless otherwise indicated in hardware sets:
   a. Hinges are to be of a square corner five knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
   b. Out-swinging exterior and out-swinging access controlled doors shall have non-removable pins (NRP) to prevent removal of pin while door is in closed position.
   c. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
   d. Electric Through Wire (ETW) to have appropriate number of wires to transfer power through door frame to door for proper connection of finish hardware and certified to handle an amperage rating of 3.5 AMPS/continuous duty with 16.0 AMPS/intermittent duty.
   e. Provide mortar boxes for frames that require any electrically modified hinges if not an integral part of frame.
   f. When shims are necessary to correct frame or door irregularities, provide metal shims only.

2.3 MORTISE LOCKS AND LATCHES:

A. Locks and latches shall be of one manufacturer as listed for continuity of design and consideration of warranty.
B. Standards: Manufacturer to be certified and or listed by the following:
   1. ANSI/BHMA A156.13 Series 1000 Certified to Grade 1 for Operational and Security.
   2. UL/cUL Labeled and listed for functions up to 3 hours for single doors up to 48 inches in width and up to 96 inches in height.
   3. ANSI/UL10C/UBC 7-2 Positive Pressure Rated.
   4. ICC/ANSI A117.1.
C. Lock and Latch function numbers and descriptions of manufacturer's series as listed in hardware sets.
D. Material and Design:
   1. Lock cases from fully wrapped, 12 gage steel, zinc dichromate for corrosion resistance.
   2. Non-handed, field reversible without opening lock case.
   3. Break away spindles to prevent unlocking during forced entry or vandalism.
   4. Levers are to be zinc cast, forged brass or stainless steel and plated to match finish designation in hardware sets.
   5. Escutcheons are to be of solid brass or stainless steel material.
   6. Armor fronts are to be self adjusting to accommodate a square edge door or a standard 1/8" beveled edge door.
E. Latch and Strike:
   1. Stainless steel latch bolt with minimum of ¾" throw and deadlocking for keyed and exterior functions.
   2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4 inches x 4-7/8 inches with proper lip length to protect surrounding trim.
   3. Deadbolts to be 1-3/4 inches total length with a minimum of a 1 inch throw and ¾ inch internal engagement when fully extended and made of stainless steel material.

2.4 EXIT DEVICES:

A. Shall be touch pad type, finish to match balance of door hardware. Exit devices shall be of one manufacturer as listed for continuity of design and consideration of warranty.
B. Standards: Manufacturer to be certified by the following:
   1. Exit Devices: ANSI/BHMA A156.3 Grade 1
   2. UL labeled panic exit hardware
   3. UL labeled fire exit hardware
C. Touch pad shall extend a minimum of one half door width. Lever design shall match design of locks levers. Exit device to mount flush with door.
D. Components:
   1. Covers and end caps shall be brass, bronze, or stainless steel.
   2. Chassis shall be cold forged steel.
E. Lock and Latch Functions: Function numbers and descriptions of manufacturer's series and lever styles indicated in door hardware sets.
F. Mounting:
   1. 4-1/2 inch minimum stile width required for double doors with concealed vertical rod devices.
   2. 4-1/2 inch minimum stile width required for single door.
   3. 4-1/2 inch minimum stile width required for double door with rim devices.

G. Fasteners:
   1. Wood and machine screws, as required. The use of thru-bolts is not allowed. Mount exit devices to doors which provide the required blocking and reinforcement necessary for installation without the use of thru-bolts.

2.5 CYLINDERS AND KEYING:
A. Cylinders shall be of one manufacturer as listed for continuity of design and consideration of warranty.
B. Standards: DHI Handbook - TDH 004: “Keying systems and nomenclature”.
C. Cylinders:
   1. Manufacturer’s standard tumbler type, seven pin interchangeable core.
   2. Shall be furnished with cams/tailpieces as required for the locking device that is being furnished for the project.
D. Keying:
   1. Contact Owner with representative from hardware supplier to establish a keying conference. Verify keyway, visual key identification, number of master keys and keys per lock. Provide keying system per Owner’s instructions.
   2. Copy of Owner’s approved keying schedule shall be submitted to Owner and Architect with documentation of when the keying conference was held and the Owner’s sign-off.
   3. Provide a bitting list to the Owner of all combinations as established, and expand to twenty five percent for future use or as directed by Owner.
   4. Key into Owner’s existing keying system, if applicable.
   5. Provide interchangeable cores with construction cores as required.
   6. Keys to be shipped to Owner’s representative; individually tag per the keying conference.
   7. Provide visual key control identification on keys.
   8. Key control system: include two set of key tags, hooks, labels, and envelopes. Contain system in metal cabinet with baked enamel finish, surfaced mounted to wall. Capacity shall be able to hold actual quantities of keys, plus 25 percent.

2.6 CLOSERS:
A. Shall be the product of one manufacturer. Unless otherwise indicated on hardware schedule, comply with manufacturer’s recommendations for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirements, and fire rating.
B. Standards: Manufacturer to be certified by the following:
   1. Closers ANSI/BHMA A156.4 Grade 1
   2. ADAAG
   3. ICC/ANSI A117.1
   4. UL/cUL Listed up to 3 hours
   5. ANSI/UL10C Positive Pressure Rated
C. Provide cast iron non-handed bodies with full plastic covers. Closer shall have separate staked adjustable value screws for latch speed, sweep speed, and backcheck, delayed action valve optional. Provide Tri-Pack arms and brackets for regular arm, top jamb, and parallel arm mounting for each closer.
D. Components:
   1. One piece seamless steel spring tube to seal in hydraulic fluid.
   2. Double heat treated steel tempered springs.
   3. Precision machined heat treated steel piston.
   4. Triple heat treated steel spindle.
   5. Full rack and pinion operation.
E. Mounting:
   1. Outswing doors shall have surface parallel arm mount closers except where noted on hardware schedule.
   2. Inswing doors shall have surface regular arm mount closers except where noted on hardware schedule.
   3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
   4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.
F. Fasteners: Provide self reaming and self-tapping wood and machine screws. The use of sex nuts and bolts is not allowed.
G. Pull effort on doors with closers to be maximum of 5 lbs. at interior doors and 5 lbs at exterior doors. The authority having jurisdiction may increase the maximum effort to operate the doors to

achieve positive latching, but not to exceed 15 lbs., per CBC 11B-404.2.9. Doors shall also comply with CBC 11B-404.2.8.1, closer delay time.

2.7 FLOOR CLOSERS:
- A. Shall be product of one manufacturer. Unless otherwise indicated on hardware schedule, comply with manufacturer's recommendations for size of closer, depending on width of door, frequency of use atmospheric pressure, and fire rating.
- B. Standards: Manufacturer to be certified by the following:
  1. Closers ANSI/BHMA A156.16
  2. UL/cUL Listed up to 3 hours
- C. Closer to have separate, independent, and adjustable valve for closing speed, latch speed, and backcheck. Independent delayed action optional. Closer to have built-in dead stop to prevent door from swinging beyond required opening degree.

2.8 FLUSH BOLTS AND COORDINATORS:
- A. Labeled openings: Provide automatic or constant latching flush bolts per hardware schedule for inactive leaf of pairs of doors. Provide dust proof strikes for bottom bolt.
- B. Where flush bolts occur in Path of travel, provide automatic flush bolts to comply with CBC 11B-404.2.7. Automatic flush bolts shall meet ANSI/BHMA A156.3.
- C. Non-labeled openings: Provide two flush bolts for inactive leaf of pairs of doors per hardware schedule. Top bolt shall not be more than 78 inches centerline from floor. Provide dust proof strike for bottom bolt.
- D. Coordinators: Provide for labeled pairs of doors with automatic flush bolts. Provide filler piece to extend full width of stop on frame. Provide mounting brackets and special preparation for latches where applicable.
- E. Manual flush bolts shall meet ANSI/BHMA A156.16 requirements. Manual flush bolts are used only where doors are not used by persons in wheelchairs.

2.9 PUSH PLATES AND PULL PLATES:
- A. Push plates: .050 inch thick, square corner and beveled edges with counter sunk screw holes. Width and height as stated in Hardware schedule.
- B. Pull plates: .050 inch thick, square corner and beveled edges. Width and height as stated in door schedule, ¾ inch diameter pull, with clearance of 2-1/2 inches from face of door.
- C. Standards: Manufacturer to be certified by the following:
  1. Architectural Door Trim: ANSI/BHMA A156.6.
  2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

2.10 PROTECTIVE TRIM:
- A. For single doors, size two inches less door width (LDW) on push side of door, and one inch less on pull side of door by 10 inches high. For pairs of doors, size one inch less door width (LDW) on push side of door, and ½ inch on pull side of door by 10 inches high.
- B. Standards: Manufacturer to be certified by the following:
  1. Architectural Door Trim: ANSI/BHMA A156.6.
  2. UL
- C. Kick plates shall be 0.050 inch thick stainless steel.
- D. Fasteners: Supply #6 x 5/8 inch truss head screws, unless otherwise noted.

2.11 STOPS AND HOLDERS:
- A. Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops wherever possible. Door stops and holders mounted in concrete floor or masonry walls shall have stainless steel machine screws and lead expansion shields. Floor stops shall be mounted maximum 4 inches out from walls.
- B. Standards: Manufacturer to be certified by the following:
  1. Stops and Bumpers: ANSI/BHMA A156.16.
  2. Overhead Stops and Holders: ANSI/BHMA A156.8.
- C. Where wall stops are not appropriate, provide overhead stops or holders. Floor stops should only be used as the last means of stopping door. Do not mount floor stops where they will impede traffic.
- D. Overhead stops and holders: Provide overhead stop and holders for doors that open against equipment, casework, sidelights, and other objects that would make wall stops/holders and floor stops/holders inappropriate per the hardware schedule.

2.12 DOOR GASKETING AND WEATHERSTRIP:
- A. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing where indicated on hardware schedule. Provide non-corrosive fasteners for exterior applications.
  1. Perimeter gasketing: Apply to head and jamb, forming seal between door and frame.

2. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are in closed position.
3. Door bottoms: Apply to bottom of door, forming seal with threshold or floor when door is in closed position.
4. Sound Gasketing: Cutting or notching for stop mounted hardware not permitted.

B. Standards: Manufacturer to be certified by the following:
1. Door Gasketing and Edge Seal Systems: ANSI/BHMA A156.22.

C. Smoke-Labeled Gasketing: Comply with NFPA 105 listed and labeled and acceptable to authorities having jurisdiction, for smoke control indicated.
1. Provide smoke labeled gasketing on 20 minute rated doors and on smoke rated doors.

D. Fire-Labeled Gasketing: Comply with NFPA 80 listed and labeled and acceptable to Authorities having jurisdiction, for fire ratings indicated.

E. Comply with UBC 7-2 and UL10C positive pressure where frame applied intumescent seals are required; refer to Section 08 14 16 - FLUSH WOOD DOORS, and Section 08 81 00 - GLASS GLAZING.

2.13 THRESHOLDS:

A. Secured with lead expansion shields and stainless steel machine screws. Notched in field to fit frame by hardware installer. Refer to Drawings for special details.

B. Thresholds shall meet BHMA A156.21 requirements, and conform to CBC.

2.14 SILENCERS: Where smoke, light, or weather seal are not required, provide three silencers per single door frame, two per double door frame.

2.15 POWER SUPPLY:

A. Security Contractor to provide and coordinate use of power supplies with door and frame locations.

B. Power Supplies, relays and battery backup units are to be provided as part of the overall system in accordance with the manufacturers warranty and system requirements.

C. UL listed for applicable use; housed in an approved enclosure; and provide Class 1 output.

D. Output shall be filtered and regulated. Relay, timer, and logic modules shall be as required for interface to indicated security components; and shall be assembled, connected, and fully contained within the power supply enclosure.

E. Provide required connections to the Fire Alarm / Life Safety System and for remote site activation of all electrified components and functions.

F. Provide the quantity of power supplies required per the system load requirements, plus 25%.

G. Coordinate the location of the power supplies with the Electrical Contractor, as directed by the Architect.

2.16 FINISHES:

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if within range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples.

B. Comply with the base material and finish requirements indicated by BHMA designations in the hardware schedule.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Examination: Examine conditions of work in place before beginning work; report defects.

B. Measurements: Take field measurements; report variance between plan and field dimensions.

C. Delivery:
1. Packaging: Identify door number, hardware type, location and hand of door on each package.
2. Keys: Label and deliver keys by registered mail or personal messenger directly to Architect.

3.2 APPLICATION:

A. General: Install in strict conformance with referenced standards, the manufacturer's written directions, as shown, and as herein specified.

B. Hardware Placement:
1. General: Except for hinges, do not install hardware until completion of painting and finishing work. Unless otherwise shown, place hardware at following height above finish floor:
2. Strike (Centerline) for Locks and Latches: Between 40 inches and 42 inches.
3. Hinges: Manufacturer's standard.
4. Door Pull (Centerline): 42 inches.
5. Push Plate (Centerline): 44 inches.
6. Deadlocks (Centerline of Cylinder): 44 inches.

C. Floor Clearances:
   1. Labeled Doors: 3/8 inch maximum over floor or threshold.
   2. No Threshold: 3/4 inch maximum for metal doors; 5/8 inch maximum for wood doors.
   3. Threshold: 1/8 inch typical.
   4. Carpet: 1/8 inch over top of nap, unless otherwise shown.

D. Installation:
   1. General: Install hardware in precise manner; door clearance and hardware placement as specified. Predrill pilot holes in wood for screws. Drill and tap for surface mounted hardware on metal.
   2. Hinges: Set hinge leaves snug and flat in mortises; turn screws to flat seat (do not drive). Drive hinge pins down and tighten set screws.
   3. Closers: Mount door closers for maximum swing of door before setting stops.
   4. Silencers: Set in place before adjusting strikes.
   5. Locksets: Install locks with keyways in proper position; levers, roses and escutcheons firmly attached.
   6. Thresholds: Set in waterproof sealant; secure with lead shields and countersunk screws of same finish as threshold.

3.3 ADJUSTMENT AND MAINTENANCE:

A. General: Prior to acceptance, adjust moveable parts to assure smooth operation.

B. Door Closers: Adjust for closing speed, latching speed, back checking, and hold-open devices for full control of door. Adjust operation of doors to require a maximum of 5.0 lbs. for exterior doors; 5.0 lbs. for interior doors; and 15 lbs. for fire doors.

3.4 HARDWARE GROUPS: As shown on Drawing Sheet A-2.0 - Floor Plan.

* * *

Section 08 81 00
GLASS GLAZING

PART 1 - GENERAL
1.1 SUMMARY: Provide Glass and Glazing, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American National Standards Institute (ANSI):
1. ANSI/ASTM E330: Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
2. ANSI Z97.1: Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.
B. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
C. Consumer Product Safety Commission (CPSC): 16 CFR 1201 – Safety Standard for Architectural Glazing Materials.
D. Glass Association of North America (GANA): "Engineering Standards Manual" and "Glazing Manual".
E. Sealed Insulating Glass Manufacturers Association (SIGMA): SIGMA No. 64-7-2 - Specification for Sealed Insulating Glass Units.
1.3 SUBMITTALS:
A. General: Submit product data; a List of Materials proposed for use with each glazing condition identified; samples if specifically requested; and certificates stating that products installed comply with U.S. Consumer Product Safety Commission Standards.
B. Closeout:
1. General: Submit maintenance data.
2. Guarantee:
a. General: Provide in required form for a period of one (1) year from date of final acceptance by Owner, except as follows:
b. Float Glass: Per requirements of ASTM C1036 and ASTM C1048.
c. Insulating Glass: Five (5) years.
1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Manufacture:
1. General: Manufactured by Vitro Architectural Glass; unless otherwise indicated.
2. Alternate Manufacturers: Comparable products manufactured by Southwall Technologies, or accepted equal.
B. Flat Glass:
1. General: Clear 7/32 inch thick unless otherwise shown.
2. Float Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, quality q3 glazing select.
3. Insulated Glass Units: Double pane with glass elastomer edge seal; outer pane specified Low-E glass, inner pane of 3/16 inch clear glass; inter pane space purged by dry air; total unit thickness of 29/32 inch; conforming to ASTM E2190 with IGCC class CBA rating.
4. Low E Glass: "Solarban Z50"; clear; thickness as shown.
C. Glazing Materials:
1. General: Factory mixed materials recommended by glass manufacturer for each glazing condition. Provide glazing and bedding putties to match color of frame, sealants, tapes, and other materials necessary to perform glazing work. Provide setting blocks, shims, compression seals, felt and neoprene or vinyl glazing channels as required.
2. Butyl Glazing Tape:
a. General: 440 Butyl Glazing Tape as manufactured by Tremco, Inc.
b. Alternate Manufacturers: Comparable products manufactured by the GE Sealants and Adhesives, or accepted equal
3. Accessories:
a. General: Materials recommended by glass or glazing material manufacturer.
b. Setting Blocks and Spacers: Neoprene chemically compatible with specified sealants.
c. Glazing Points and Spring Wire Clips: Corrosion resistant.

d. Filler Rod: Compressible synthetic rubber or foam.
e. Primer-Sealers and Cleaners: As recommended by glass manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements: Glaze in dry conditions; minimum temperature 40 degrees F during and 48 hours after installation of glazing compounds.
B. Examination: Examine conditions of work in place before beginning work; report defects.
C. Measurements: Take field measurements; report variance between plan and field dimensions.
D. Delivery: Deliver with manufacturer's labels intact; do not remove until completion of final inspection.
E. Protection: Protect glass from damage until occupancy of building; replace glass damaged or broken before final acceptance.
F. Surface Preparation: Clean contact surfaces with solvent and wipe dry. Seal porous glazing channels or recesses with material compatible with sealer. Prime surfaces scheduled to receive sealant.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Glass:
   1. Dimensions: As shown; tolerances as recommended by manufacturer.
   2. Edges: Per referenced standards; nipped edges, or edges treated with abrasives, not acceptable.
C. Glazing:
   1. General: Use glass as shown; glaze with glazing compound or glazing gaskets as required.
   2. Float Glass: Type and thickness, as shown.
   3. Insulated Glass Units:
      a. General: Install on exterior, where shown.
      b. Low-E Glass: Install coated surface on inside of insulated glazed units.

* * *

Division 09 - FINISHES

Section 09 22 16
NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY: Provide Non-structural Metal Framing, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM):
1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
2. ASTM A123: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM C645: Standard Specification for Nonstructural Steel Framing Members.
4. ASTM C754: Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
5. ASTM C840: Standard Specification for Application and Finishing of Gypsum Board.
6. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials.

B. Intertek: Fire and flammability testing.

C. Steel Stud Manufacturers Association (SSMA): Product Technical Guide.

D. The Society for Protective Coatings (SPC): SSPC Paint 20 - Zinc-Rich Coating Inorganic and Organic.

E. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.

1.3 SUBMITTALS:

A. General: Submit product data, shop drawings and samples.

B. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Manufacture:
1. General: Manufactured by California Expanded Metal Products Co.
2. Alternate Manufacturers: Comparable products manufactured by Clark Dietrich Bulding Systems, LLC, or accepted equal.

B. Stud Types:
1. General: Provide types designed for screw application of gypsum wallboard.
2. Metal Studs: ASTM C645, non-load bearing type with punched webs; roll-formed electro-galvanized steel sheet; 25 gage, unless otherwise shown.

C. Channels:
1. Runners:
a. General: 1/2 inch cold rolled steel weighing not less than 475 lbs. per 1000 lineal feet; rust-inhibitive coated.
b. Single Long-Leg Runner: Top runner with 2-inches deep flanges in thickness not less than indicated for studs.
c. Slotted Track: Minimum 2.5 inches legs with 1.5 inch tall by 0.22 inch wide slots with maximum 1 inch spacing along length of track.
2. Furring: 25 gage electro-galvanized steel sheet, roll-formed, 2-3/4 inch x 7/8 inch deep with 1/2 inch wide flanges.
3. Bridging:
a. General: 16 gauge minimum electro-galvanized steel, 1-1/2 inches deep with minimum 1/2-inch wide flanges.
b. Clip Angle: Not less than 1-1/2 inch x 1-1/2 inch x 0.068 inch thick galvanized steel.
4. Stiffeners: 3/4 inch cold rolled steel weighing not less than 300 lbs. per 1000 lineal feet; rust-inhibitive coated.

D. Fasteners:

1. Expansion Bolts: FS FF-S-325, Group III, expansion shield (self-drilling tubular expansion shell anchor bolts); Type 1 or 2, unless otherwise shown.
2. Powder Driven Fasteners:
   a. General: X-ZF fasteners manufactured by Hilti, Inc.; size as shown.
   b. Alternate Manufacturers: Comparable products with current ICBO approval and equal or greater rated load capacity, manufactured by the US Anchor Corp., or accepted equal.
3. Screws: Type S bugle head; sizes recommended by gypsum board manufacturer.

E. Wire Hangers: 8 gage galvanized soft steel wire.
F. Neoprene Tape: ASTM D1056, Grade SCE41, soft sponge neoprene with adhesive one side; black; 1/4 inch x 1/2 inch, unless otherwise shown.

PART 3 - EXECUTION

3.1 PREPARATION:
A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Metal Framing: PerASTM C754.
C. Fire Rated Assemblies: Per UL and code requirements. Use one manufacturer for each assembly, unless otherwise permitted by governing authorities.
D. Metal Stud Partitions:
   1. General: Install complete with matching runner tracks and accessories. Align runner tracks accurately to partition layouts.
   2. Floor Runners: Secure with 1/4 inch diameter expansion bolts or powder driven fasteners at least 1 inch long, where permitted by code. Space fasteners 4 inches from ends of each piece; maximum 24 inches on center intermediately; minimum of 2 fasteners per piece of runner.
   3. Ceiling Runners:
      a. General: Install to heights and levels, or to structure above as shown.
      b. To Concrete: Fasten as specified for floor runners.
      c. To Structural Steel: As specified for metal decking; secure with welds or other appropriate means in lieu of powder driven fasteners.
   4. Studs: Gages, depths, and spacing shown. Where not shown, provide per stud manufacturer's recommendations.
   5. Stiffeners: 2 rows at third points for studs with finish one side only; one row at midpoint for studs with finish both sides. Snap into punched web of each stud; nest laps and wire tie.
E. Backing Plates: Install for built-in items; attach to metal studs by welds or sheet metal screws as applicable.
F. Suspended Ceilings:
   1. General: Install for gypsum wallboard ceilings. Where ductwork or other obstructions prohibit use of specified system, provide heavier system per referenced Standard.
   2. Hanger Wires:
      a. General: Space at 48 inches on center both ways; do not support more than 16 square feet of ceiling per wire. Locate a hanger within 6 inches of end of main runners.
      b. Steel Supports: Wrap around or through steel, or attach by other acceptable methods.
   3. Runner Channels: Space not over 48 inches on center; wrap each hanger wire twice around runner channel.
   4. Furring Channels: Attach to runner channels at 16 inches on center with snap-on clips or other acceptable methods.
   5. Openings: Reinforce as required for support of mechanical and electrical fixtures.
   6. Seismic Restraint: As shown.
G. Galvanizing Repair: Repair galvanizing damaged during fabrication and installation; refer to Section 05 50 00 - METAL FABRICATIONS.
H. Tolerances: Vertical deflection at ceiling joist framing of 1/240 of the span.

* * *

Section 09 29 00
GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY: Provide Gypsum Board, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM):
   1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
   2. ASTM C11: Terminology Relating to Gypsum and Related Building Materials and Systems.
   3. ASTM C840: Specification for Application of Gypsum Board.

B. Gypsum Association (GA):
   1. GA-214: Recommended Levels of Gypsum Board Finish.
   2. GA-216: Recommended Specifications for the Application and Finishing of Gypsum Board.
   3. GA-600: Fire Resistance Design Manual.

C. Intertek Testing Services (ITS): Certification Listings.

D. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.

1.3 SUBMITTALS:

A. General: Submit product data and samples.

B. Closeout: Submit maintenance data and guarantee in required form for a period of two (2) years from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE:

A. Fire Rated Assemblies: Provide materials and construction identical to those tested in assembly indicated per ASTM E119 by an independent testing laboratory and acceptable to the jurisdictional authorities.

B. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Manufacture:
   1. General: Products manufactured by the Gold Bond Building Products Division of the National Gypsum Corp., unless otherwise indicated.
   2. Alternate Manufacturers: Comparable products manufactured by the PABCO Gypsum Division of PABCO Building Products, LLC, or accepted equal.

B. Gypsum Wallboard:
   1. General: Gold Bond Gypsum Wallboard conforming to ASTM C1396; tapered edge where joint finish is required; 5/8 inch thickness, unless otherwise shown.
   2. Surface Paper: 100% recycled content paper on front, back and long edges.
   3. Fire-resistant: Gold Bond Gypsum Fire-Shield "Type X" fire-rated, with UL label; use throughout unless otherwise shown.
   4. Moisture and Mold Resistant: e2XP Extended Exposure Interior Extreme conforming to ASTM C1658 and applicable sections of ASTM C1396.

C. Control Joints, Corner Reinforcement and Casing Beads: Manufacturer's standard galvanized steel at exterior corners and L-shaped casing without back flange.

D. Joint System Materials:
   1. General: ASTM C475.
   2. Tape: ProForm Paper Joint Tape.
   3. Joint Compound: ProForm All Purpose Ready Mix Joint Compound.
   4. Joint Finishing Compound: ProForm Topping Joint Compound.
   5. Texture: As recommended by manufacturer for type of use and level of finish specified.

E. Fasteners:
   1. Screws:
      a. General: ASTM C954, Type W drywall screws; provide a minimum of ¾ inch penetration into wood framing.
      b. Metal Studs and Furring Channels: ASTM C1002, phillips, flat head, recessed, bugle shaped, self drilling, self tapping, rust inhibitive coated steel screws.

F. Adhesive: ASTM C1396 as recommended by manufacturer.

G. Interior Wall Sealant:
   1. General: Acoustical/Curtainwall Sealant as manufactured by the Sealant/Weatherproofing Division, Tremco, Inc.
   2. Alternate Manufacturers: Comparable products manufactured by the Pecora Corp., or accepted equal.

PART 3 - EXECUTION

3.1 PREPARATION:
   A. Environmental Requirements: Do not install wallboard or joint compounds if building temperature is below 55 degrees F. Provide proper ventilation to eliminate excessive moisture from building.
   B. Examination:
      1. General: Examine conditions of work in place before beginning work; report defects.
      2. Framing: Verify accurate spacing and alignment; refer to Section 09 22 16 - NON-STRUCTURAL METAL FRAMING.
   C. Measurements: Take field measurements; report variance between plan and field dimensions.
   D. Delivery: Stack wallboard flat, off the ground, properly supported and protected from weather; use protective covering.
   E. Protection: Protect edges and surfaces from construction damage and soiling.

3.2 INSTALLATION:
   A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
   B. Gypsum Wallboard:
      1. General: Apply per ASTM C840 and manufacturers instructions.
      2. Sheet Arrangement Layout: Install as shown; use long sheets to restrict joints to minimum.
      3. Cutting and Scribing:
         a. General: Cut neatly to fit around outlets, switch boxes and other protrusions.
         b. Moisture Resistant Gypsum Board: Treat cut edges and holes with sealant.
      4. Joints: Butt sheets loosely together with tapered edges placed together; butt edges placed next to tapered edges are not acceptable. Sand or kerf cut edges and mill ends to provide smooth jointing on exposed face. Stagger end joints. Shim wallboard as required to provide even joints, without offsets.
      5. Fasteners:
         a. General: Place not less than 3/8 inch from edges of board, with heads dimpled slightly below surface; do not cut through paper.
         b. Ceilings, Non-rated: Nails, 7 inches on center; screws, 12 inches on center.
         c. Walls, Non-rated: Nails, 8 inches on center; screws, 12 inches on center.
         d. Ceilings, One-hour Rated: As shown.
         e. Walls, One-hour Rated: As shown.
      6. Trim: Place control joints consistent with lines of building; corner reinforcement at exterior corners; and casing beads where wallboard abuts other materials, and as shown.
      7. Interior Wall Sealant: Install double bead of sealant at floor, wall intersections, where walls abut other materials, electrical boxes and any other penetrations of interior partitions.
      8. Partitions:
         a. General: Place boards with long dimensions either vertical or horizontal on studs; stagger vertical joints on opposite sides of partitions; keep end joints to minimum. Locate joints a minimum of 12 inches from jambs of openings.
         b. Deflection: Where gypsum board is carried full height of wall to the structure above, undercut the board by 3/8 inch and seal the top edge of the board to structure with continuous bead of sealant.
      9. Ceilings: Install boards with long dimension at right angles to supports; end joints, perimeter of ceiling and edge of openings over solid bearing members.
      10. Fire Rated Assemblies:
         a. General: Per UL and applicable code requirements. Use only one manufacturer's products in the fabrication of each assembly, unless otherwise permitted by code.
         b. One (1) Hour: As shown.
      11. Gypsum Board Attachment: Place the long edge of gypsum board panel parallel with and centered on channels; hold back 1/4 inch at all intersecting surfaces. Screw attach to channels; do not allow screws to penetrate framing, must only be screwed to the channels and never come in contact with framing or other structure behind the channels.

C. Accessories:
   1. Corner Reinforcement: Install at outside corners. Use single lengths where length of corner does not exceed standard length.
   2. Casing Beads: Install where shown, gypsum board abuts dissimilar material, or stops with edge exposed.
   3. Control Joints: Install where shown.

D. Finishing:
   1. General: Finish joints, fastener depressions, applied metal trim and surface blemishes per manufacturer's directions.
   2. Finished Wallboard: Sand as necessary to provide flat, smooth surface ready for decoration.
   3. Concealed Wallboard: Wallboard covered by panels or wall-fastened casework, and wallboard above level of finished ceiling, does need to be sanded smooth.
   4. Existing Wallboard: Where existing and new wallboard join, finish remaining gypsum board and sand as necessary to provide flat, smooth surface.
   5. Textured Surfaces:
      a. General: Finish gypsum board in compliance with GA 214 requirements. Apply Level 3 finish followed by a spray applied “Sand“ finish, unless otherwise noted.
      b. Water-resistant Tile Backer Board: Finish per ASTM C840 and manufacturer’s instructions for treatment of joints behind thin-set tile.
   6. Tolerances:
      a. General: Refer to Section 01 43 00 - QUALITY ASSURANCE.
      b. Maximum Variation: 1/8 inch in 10'-0" in any direction.

3.3 CLEANING:

A. General: Remove debris, scraps, spillage, overspray and dust from surfaces to receive subsequent finishes.

B. Waste Management: Separate clean waste gypsum products from contaminants per Section 01 74 19 - CONSTRUCTION WASTE MANAGEMENT.

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Section 09 30 00
TILING

PART 1 - GENERAL
1.1 SUMMARY: Provide Tiling, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American National Standards Institute (ANSI):
1. ANSI A108/A118/A136: American National Standards Specifications for the Installation of Ceramic Tile.
2. ANSI/TCA A137.1: American National Standard Specifications for Ceramic Tile.
B. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
C. International Association of Plumbing and Mechanical Officials (IAPMO): Waterproof membrane certification.
D. Portland Cement Association (PCA): Portland Cement Plaster/Stucco Manual.
E. Tile Council of North America (TCNA): Handbook for Ceramic Tile Installation.
F. Steel Stud Manufacturers Association (SSMA): Product Technical Information - Specifications for lathing and furring.
1.3 SUBMITTALS:
A. General: Submit product data.
B. Samples:
1. Ceramic Tile: Submit each type, class and color.
2. Grout: Submit manufacturer's standard colors.
C. Certificates: Submit Master Grade Certificate per ANSI/TCA A137.1, from tile manufacturer for each type of tile installed.
D. Closeout: Submit maintenance data and guarantee in required form for a period of two (2) years from date of final acceptance by Owner.
E. Extra Stock: Deliver one (1) percent or a minimum of one full container of each kind and type of tile installed.
1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Ceramic Tile:
1. General: Specified products are manufactured by the Crossville Ceramics, Inc., unless otherwise indicated.
2. Alternate Manufacturers: Comparable products manufactured by Dal-Tile International, or accepted equal.
3. Manufacture: Conform to ANSI/TCA A137.1.
B. Type:
1. Wall Tiling: Crossville Stone Fiction/STF02, 24 inch x 24 inch; type and color selected by the Architect.
2. Base Units: 4 inch x 24 inch Travertine Beige bullnose.
3. Mounting: Dot type adhesive.
C. Setting Bed:
1. General: Specified products are manufactured by the United States Gypsum Co.
2. Alternate Manufacturers: Comparable products manufactured by the Gold Bond Building Products Division of the National Gypsum Corp., or accepted equal.
3. Lath:
a. General: ASTM C847, flat diamond, 2.5 lbs. per square yard.
b. Expanded Metal Lath: Conform to CBC Chapter 25 for lath types, weights, attachments and support spacing, except where otherwise noted.
4. Lathing Accessories:
a. Fasteners:
1. Screws: ASTM C954, Type W; provide a minimum of ¾ inch penetration into wood framing.
2. Hook Staples: 1/2 inch wide x 1-1/2 inches long, No. 9 gage ring shank, hook staple.
3. Tie Wire: 18 gage galvanized annealed steel.

b. Screeds: ASTM C1047, galvanized steel.
5. Cement Plaster:
a. Cement: ASTM C150, Type I, Portland.
b. Lime: ASTM C207, Type S.
c. Aggregate: Sand per ASTM C897.
d. Water: Clean, fresh, potable and free of mineral or organic matter which can affect plaster.

D. Grout Joint Filler:
1. General: Mapai Grout manufactured by Mapai, 14 Biscuit color.
2. Alternate Manufacturers: Comparable products manufactured by Custom Building Products, or accepted equal.

E. Sealants: As specified in Section 07 92 10 - JOINT SEALERS.
F. Curing Paper: FS UU-P-790, Type II, Grade E, Style 8.

2.2 MIXES:
A. General: Per ASTM C926; mix only as much plaster as can be used prior to initial set. Protect mixtures from freezing, frost, contamination, and evaporation. Do not retemper mixes after initial set has occurred.
B. Cement Plaster Mortar: Comply with requirements of referenced standards, including those for accurate proportioning of materials, water, or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars of uniform quality with optimum performance characteristics for application shown.
C. Grout Joint Filler: Per manufacturer's recommendations.

PART 3 - EXECUTION

3.1 PREPARATION:
A. Scheduling: Do not apply floor tile in space requiring wall tile until wall tile setting is complete.
B. Environmental Requirements: Maintain minimum temperature of materials, substrate and ambient air temperature above 50 degrees F during application and for at least 48 hours after each coat is applied. Do not apply when temperature exceeds 80 degrees F, or during wet or windy weather conditions.
C. Examination: Examine conditions of work in place before beginning work; report defects.
D. Measurements: Take field measurements; report variance between plan and field dimensions.
E. Protection: Protect adjacent surfaces from splattering of plaster during installation and from damage during subsequent construction. Remove cracked, broken, and damaged tiles; replace with new.
F. Surface Preparation:
1. General: Verify that surfaces to receive tile are completely clean and free of material that might affect the adhesion of either grout bed set or adhesive applied tile.
2. Moisture Testing: Per ASTM F1869; proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lbs. of water per 1000 square feet in 24 hours.

3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Workmanship:
1. General: Comply with TCNA "Handbook for Ceramic Tile Installation", for applicable substrate conditions.
2. Wall Tile: Mortar bed; TCNA W231 and ANSI A108/A118/A136.
3. Joints for Vertical and Horizontal Tile Surfaces: TCNA EJ171.
4. Grout: ANSI A108/A118/A136.

C. Cutting:
1. General: Do not use cut tile smaller than half size; use cut tile on outer edges of field only.
2. Smoothing: Level cut edges with carborundum stone; install no tile with jagged or flake edges.
3. Splitting: Expressly prohibited except where no alternative is possible.

D. Wall Tile:
1. General: Apply tile to firm, level, plumb, and square surfaces. Lay tile with minimum number of cut tiles; tiles less than one-half size in either face not permitted.
2. Pattern: As shown.
3. Corners: Round outside; square inside.
4. Joints: Align with floor tile; 1/16 inch wide.

5. Setting Method:
   a. General: Install per ANSI A108/A118/A136 and as specified. Provide where shown.
   b. Thickness; Setting Bed Mortar: Including scratch coat; 3/4 inch thick minimum.
6. Penetrations: Fit tile closely around penetrations and where edges will be covered by trim, escutcheons or other similar devices.
7. Sealant: Fill joints between wall tile and plumbing and other built-in fixtures with silicone rubber sealant of color to match tile.

3.3 CLEANING: Upon completion clean per ANSI A108/A118/A136.

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Section 09 51 00
ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY: Provide Acoustical Ceilings, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM):
   1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
   2. ASTM C635: Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

B. Ceiling and Interior Systems Construction Association (CISCA): Acoustical Ceilings, Use and Practice.

C. International Codes Council (ICC):
   1. ICC ESR-1289: Evaluation Report - Fire- and Nonfire-Resistance-Rated Suspended Ceiling Framing Systems.
   2. ICC ES ESR-1308: Fire- and Nonfire-Resistance-Rated Suspended Ceiling Framing Systems.
   3. ICC ES AC-156: Seismic Certification by Shake-table Testing of Nonstructural Components.

D. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.

1.3 SUBMITTALS:

A. General: Submit product data.

B. Shop Drawings: Submit shop drawings showing suspension system details and reflected ceiling plans indicating location of light fixtures, mechanical air supply and return outlets and other items affecting ceiling construction. Identify locations of types of suspension systems and types of panels or tile including access panels, where required.

C. Samples:
   1. Acoustical Board: Submit manufacturer's standard color range.
   2. Suspension System: Submit manufacturer's standard color range.

D. Certificates: Manufacturer's certified test reports for each specified NRC and STC requirement.

E. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

F. Extra Stock: Deliver one (1) percent or a minimum of one full container of each kind and type of acoustical material installed.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Manufacture:
   1. General: Specified products are manufactured by Armstrong World Industries, Inc. - Ceilings, unless otherwise indicated.
   2. Alternate Manufacturers: Comparable products manufactured by USG Interiors, Inc., or accepted equal.

B. Acoustical Ceilings:
   1. Acoustical Panels: "Cortega 2 x 4 Larger Square Lay-in", Item No. 747; ASTM E1264 Type III, Form 2, Pattern CD; ASTM E84, Class A, flame spread 25, smoke developed 50 or less.
   2. Ceiling Suspension System:
      a. General: Prelude XL 15/16" Exposed Tee System; heavy duty, color selected by Architect.
      b. Hanger Wires: No. 12, minimum, galvanized, soft-annealed mild steel wire of gage certified by load test data as capable of carrying five (5) times design load.
      c. Compression Struts: As shown.

C. Acoustical Sealant: As recommended by acoustical material manufacturer; refer to Section 07 92 10 - JOINT SEALERS.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Scheduling: Do not begin installation until building is enclosed, dust-generating activities have terminated, and overhead work is completed, tested and approved.

B. Environmental Requirements: Maintain temperature approximating operational conditions, before, during and after installation; humidity not more than 70%.

C. Examination: Examine conditions of work in place before beginning work; report defects.

D. Measurements: Take field measurements; report variance between plan and field dimensions.

E. Surface Preparation: Comply with ASTM C636 Article 3, Interference of Ceiling Related Components; coordinate requirements with other trades. Verify that required work has been installed above ceiling and that perimeter wall work, where ceiling abuts, is completed and dry.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Ceiling Suspension System:

1. General: Conform to ASTM C636 and ASTM E580, and suspension system manufacturer's instructions. Erect ceiling system level within 1/8 inch in 12'-0" tolerance when measured in any direction, non-cumulatively; main runners at 4'-0" on center, with support wires at 4'-0" on center, maximum; exposed members parallel with one another, in grid layout as shown.
2. Splices and Intersections: Install with interlocking device that draws members tightly together and prevents torsional deflection.
3. Compression Struts: Install as shown.
4. Perimeter Molding and Grid: Install intersections so fastenings are concealed, as shown.
5. Tolerances: Erect ceiling system level within 1/8 inch in 12'-0" in any direction.

C. Acoustical Panels: Install in ceiling suspension system; pattern and placement as shown.

3.3 ADJUSTMENT:

A. General: Adjust sags or twists which develop in ceiling systems; replace improperly installed or damaged suspension system components and acoustical panels, as directed by the Architect.

B. Tolerances:

1. General: Refer to Section 01 43 00 - QUALITY ASSURANCE.
2. Maximum Variation from Flat and Level Surface: 1/8 inch in 12'-0", including integral mechanical and electrical components.
3. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

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Section 09 65 00
RESILIENT BASE

PART 1 - GENERAL
1.1 SUMMARY:
A. General: Provide Resilient Base, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American National Standards Institute (ANSI): ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People.
B. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
1.3 SUBMITTALS:
A. General: Submit product data.
B. Samples: Submit manufacturer's standard colors.
C. Closeout: Submit maintenance data, extra stock and guarantee in required form for a period of two (2) years from date of final acceptance by Owner.
1.4 QUALITY ASSURANCE:
A. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. General: Specified products are manufactured by Armstrong World Industries, Inc.
B. Alternate Manufacturers: Comparable products manufactured by Johnsonite, Inc., or accepted equal.
C. Resilient Base: Wall Base 4 inch high top-set base, with matching preformed end stops and molded corners; color as selected by Architect.
D. Adhesives: Moisture and alkali resistant, as recommended by flooring manufacturer.

PART 3 - EXECUTION
3.1 PREPARATION:
A. Scheduling: Do not lay flooring until other work that might cause damage to flooring is complete.
B. Environmental Requirements: Minimum temperature of building and materials maintained at 65 degrees F for 24 hours prior to and during installation, and until adhesives have cured.
C. Examination: Examine conditions of work in place before beginning work; report defects.
D. Measurements: Take field measurements; report variance between plan and field dimensions.
E. Surface Preparation: Prepare surfaces as required to receive resilient base and adhesive.
3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Adhesive Application: Per adhesive manufacturer's directions; do not exceed working area or time limits stated by manufacturer.
C. Resilient Base:
1. General: Install on surfaces as scheduled, including cabinet bases and other equipment. Provide cove base typically.
2. Application:
a. General: Set straight and level, joints closely fitted and flush; top and bottom edges in firm, full contact with floor and back bonded to wall. Protect adjacent surfaces from adhesive staining.
b. Irregular Surfaces: Masonry, concrete, or similar irregular wall surfaces, fill voids at top edge of base with adhesive filler material as recommended by base manufacturer.

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Section 09 67 23
RESINOUS FLOORING

PART 1 - GENERAL

1.1 SUMMARY: Provide Resinous Flooring, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.

1.3 SUBMITTALS:

A. General: Submit product data.

B. Samples: Submit manufacturer's standard colors; 6 inch x 6 inch.

C. Closeout: Submit maintenance data and guarantee in required form for a period of three (3) years from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience; manufacturer approved.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Epoxy Flooring:

1. General: Dex-O-Tex Flex-Shield manufactured by the Dex-O-Tex Division of the Crossfield Products Corp.
2. Alternate Manufacturers: Comparable products manufactured by Gaco Western, Inc., or accepted equal.
3. Matrix: Epoxy with colored mineral filler.
4. Non-slip Surfacing: Mineral; No. 3304 Provincial Tan color.

B. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

C. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements: Maintain ambient temperature required by manufacturer three days prior to, during, and 24 hours after installation of materials.

B. Examination: Examine conditions of work in place before beginning work; report defects. Verify concrete floors have cured a minimum 28 days, are dry to a maximum moisture content of seven (7) percent, and exhibit negative alkalinity, carbonization, or dusting.

C. Measurements: Take field measurements; report variance between plan and field dimensions.

D. Delivery: Store materials for three days prior to installation in area of installation to achieve temperature stability.

E. Protection: Cover and protect adjacent construction and equipment from damage during installation of resinous flooring material.

F. Surface Preparation: Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.

3.2 APPLICATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Subfloor Filler: Fill and level all areas of floor to receive flooring material.

C. Primers and Adhesives: Apply as recommended by flooring manufacturer.

D. Epoxy Flooring: Apply to a minimum thickness of 1/8 inch; finish to smooth level surface. Prohibit traffic on floor finish for 48 hours after installation.

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Section 09 91 00
PAINTING

PART 1 - GENERAL
1.1 SUMMARY:
A. General: Provide Painting, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM):
1. General: Materials and testing standards as identified throughout this Section.
2. ASTM D16: for interpretation of terms used in this Section.
B. Master Painters Institute (MPI): Painting Manuals.
C. National Association of Corrosion Engineers (NACE): Standards for priming and painting preparation.
D. National Paint and Coatings Association (NPCA): Guide to U.S. Government Paint Specifications.
E. Painting and Decorating Contractors of America (PDCA): Painting - Architectural Specifications Manual.
F. Scientific Certification Systems (SCS):
1. General: Scientific Certification Systems for Indoor Advantage.
2. SCS SP-01: Environmentally Preferable Product Specification for Architectural and Anti-Corrosive Paints
G. Steel Structures Painting Council (SSPC): Steel Structures Painting Manual.
1.3 SUBMITTALS:
A. General: Submit product data and a certificate stating compliance with federal, state and local VOC regulations.
B. Samples: Submit manufacturer's standard colors for each surface finishing product specified.
C. Closeout:
1. General: Submit maintenance data.
2. Extra Stock: Deliver one percent (1%) or a minimum of one (1) gallon of each color, type and surface texture of paint installed. Label each container with color, type, texture and room locations.
3. Guarantee:
a. General: Provide in required form for a period of one (1) year from date of final acceptance by Owner.
b. Criteria: Color and finish appearance shall remain unchanged throughout entire guarantee period.
1.4 QUALITY ASSURANCE:
A. Applicator: Specializing in performing the work of this Section with minimum three (3) years documented experience.
B. Volatile Organic Compounds (VOC): Use only products in compliance with VOC content limits required by state and local jurisdictional regulations.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Manufacture:
1. General: Specified products are premium grade products of the Kelly-Moore Paint Co., Inc., unless otherwise indicated.
2. Alternate Manufacturers: Comparable products manufactured by the Dunn-Edwards Corp., or accepted equal.
3. Container Label: Identify with manufacturer's name, and include description of type of paint, brand name, lot number, brand code and color designation.
B. Paint Materials:
1. General: Provide manufacturer’s standard ready mixed products, except field catalyzed coatings. Provide accessory materials such as linseed oil, shellac, thinners, cleaners and other materials not specifically indicated but required to achieve finishes specified.
2. Patching Material: Latex type as recommended by manufacturer.
3. Primer:
a. General:
1. Wood and Masonry: 250 Color Shield.
2. Metal: 5725 Acrylic Primer.

b. Interior:
1. Wall P.V.A. (Wall Sealer): 971 AcryPlex.
2. Wood (Enamel): 973 AcrePlex

4. Paints:
a. Exterior:
1. Housepaint, Semi-Gloss: 1250 AcryShield.
b. Interior:
1. Wallpaint, Flat: 1602 AcryPlex[550 AcryPlex].
2. Wallpaint, Semi-Gloss: 1650 AcryPlex.

2.2 MIXING:
A. General: Mix paints at the factory; do not alter or reduce materials except as directed by manufacturer.
B. Colors: As selected by Architect from manufacturer's full range of submitted samples; factory mix match. No tinting of finish coats will be allowed at job site unless specifically approved by Architect.

PART 3 - EXECUTION
3.1 PREPARATION:
A. Environmental Requirements:
1. General: Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the manufacturer.
2. Temperature:
a. General: Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the manufacturer.
b. Exterior Paints: 50 degrees F minimum during and for 48 hours after application; do not apply when temperature is over 85 degrees F, except in protected or shaded areas.
c. Interior Paints: 65 degrees F for minimum of 48 hours before, during and for 48 hours after application.
3. Ventilation: Provide adequate ventilation of all interior spaces during application and curing of all painting products.
4. Lighting Level: Provide minimum 80 foot candles measured at mid-height of room.
B. Examination:
1. General: Examine conditions of surfaces in place before beginning work; report defects.
2. Shop Applied Primer: Test for compatibility with subsequent cover materials.
3. Moisture Content:
a. General: Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
b. Gypsum Wallboard: 12 percent.
c. Wood: 15 percent, measured in accordance with ASTM D2016.
d. Concrete Floors: 8 percent.
4. Acceptance:
a. General: Application of first coat of painting process constitutes acceptance of surface.
b. Gypsum Board: Inspect after application of seal coat; application of subsequent coat of painting process constitutes acceptance of surface.
C. Storage:
1. General: Store in properly ventilated separate structure not less than 50'-0" from any other structure on the site.
2. Temperature: Maintain minimum of 45 degrees F and a maximum of 90 degrees F.
3. Fire Prevention: Take necessary precautions to prevent fire; remove flammable paint materials and waste from building each day or store in metal containers with covers in the paint storage structure.
4. Protection: Protect adjacent surfaces not scheduled for paint finish from damage resulting from painting operations.
D. Surface Preparation:
1. General: Clean surfaces free of dust, grease, wax, oil, rust and other foreign matter. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing. Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface conditions. Use Shellac to seal marks which may bleed through surface finishes.

2. Impervious Surfaces: Remove mildew by scrubbing with solution of trisodium phosphate and bleach. Rinse with clean water and allow surface to dry.
3. Gypsum Board Surfaces: Fill minor defects with filler compound; spot prime defects after repair.
4. Galvanized Surfaces: Remove surface contamination and oils; wash with solvent. Apply coat of etching primer.
5. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand/power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.
6. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Verify compatibility of specified primer and paint with shop applied primer.
7. Exterior Wood: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied.
8. Interior Wood: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
9. Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

E. Existing Fixtures: Remove or mask existing building detail accessories not to be painted such as building signage, outlet and switch plates, HVAC grilles, etc.; reinstall at completion of painting operations.

3.2 APPLICATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Performance:
   1. General: Apply each coat to uniform finish, slightly darker than preceding coat unless otherwise approved. Sand wood and metal lightly between coats to achieve required finish. Vacuum clean surfaces free of loose particles; use tack cloth just prior to applying next coat. Allow applied coat to dry before next coat is applied.
   2. Woodwork: Prime concealed surfaces of woodwork; where scheduled to receive stain or varnish, finish with gloss varnish reduced 25 percent with mineral spirits.
C. Finishing Mechanical and Electrical Equipment: Refer to Division 21 - FIRE SUPPRESSION; 22 - PLUMBING; 23 - HEATING, VENTILATING AND AIR CONDITIONING; and 26 - ELECTRICAL for schedule of color coding and identification banding of equipment, duct work, piping, and conduit. Paint shop-primed equipment. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are pre-finished. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint. Paint dampers exposed behind louvers and grilles to match face panels. Paint exposed conduit and electrical equipment occurring in finished areas. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
D. Exterior Surfaces:
   1. Wood; Painted: One (1) coat primer sealer; two (2) coats enamel, semi-gloss.
   2. Steel; Unprimed: One (1) coat primer; two (2) coats of enamel, semi-gloss.
   3. Steel; Shop Primed: Touch-up with primer; two (2) coats enamel, semi-gloss.
   4. Steel; Galvanized: One (1) coat primer; two (2) coats enamel, semi-gloss.
E. Interior Surfaces:
   1. Wood; Painted: One (1) coat prime sealer; two (2) coats enamel, semi-gloss.
   2. Cabinet Interior: One (1) coat prime sealer; one (1) coat enamel, semi-gloss.
   3. Steel; Unprimed: One (1) coat primer; two (2) coats enamel, semi-gloss.
   4. Steel; Primed: Touch-up with primer; two (2) coats enamel, semi-gloss.
   5. Steel; Galvanized: One (1) coat primer; two (2) coats of enamel, semi-gloss.
   6. Plaster, Gypsum Board: One (1) coat of primer sealer; two (2) coats wallpaint, flat; 2 coats semi-gloss where shown.
   7. Insulated Coverings; Canvas and Cotton: One (1) coat primer sealer; two (2) coats enamel, semi-gloss.

3.3 CLEANING:

A. General: Upon completion, remove masking materials, reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing, and thoroughly clean all exposed surfaces per manufacturer's instructions. Keep premises free from accumulation of waste and rubbish. At the completion of work remove surplus materials, rubbish, and debris.
B. Touch-up: After detailed inspection of paint work, touch up or refinish abraded, stained or otherwise disfigured work, as required by the Architect.
C. Cleaning: Remove containers, rags and debris from the site; observe special care in control or disposal of flammable materials.

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Division 10 - SPECIALTIES

Section 10 14 00
SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY: Provide Signage, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.

B. Americans with Disabilities Act (ADA):

1. General: Americans with Disabilities Act of 1990, ADA - 42 U.S. Code Chapter 126.
2. ADA Standards for Accessible Design: U.S. Department of Justice, 28 CFR Part 36 -2010.

C. California Building Code (CBC): Section 11B-703.

1.3 SUBMITTALS:

A. General: Submit product data, shop drawings and samples.

B. Closeout: Submit maintenance data, extra stock and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Signage Requirements:

1. General: Conform to the requirements of California Title 24 Accessibility Requirements and the Americans with Disabilities Act.
2. Tactile Character Type: Tactile characters on signs shall be raised 1/32 inch minimum and shall be sans serif uppercase characters accompanied by Contracted Grade 2 Braille (see note below) CBC Section 11B-703.3.
3. Tactile Character Size: Raised characters shall be a minimum of 5/8 inch and a maximum of 2 inches. CBC Section 11B-703.2.
4. Finish and Contrast: Contrast between character, symbols and their background must be 70% minimum and have a non-glare finish. CBC Section 11B-703.2 and 11B-703.5.
5. Proportions: Characters on signs shall have a width-to-height ratio of between 3:5 and 1:1 and a stroke width-to-height ratio of between 1:5 and 1:10. CBC Section 11B-703.2. All letters measured must be uppercase. After choosing a type style to test, begin by printing the letter **I, X**, and **O** at 1 inch high. Place the template's 1:1 square over the **X**, or **O**, whichever is narrower. If the character is not wider than 1 inch, nor narrower than the 3:5 rectangle, the proportions are correct. Use the 1:5 rectangle to determine if the stroke of the **I**, is too broad, and the 1:10 rectangle to see if it is too narrow. If all the tests are passed, the type style is compliant with proportion requirement.
6. Braille: California (Contracted) Grade 2 Braille shall be used wherever Braille is required in other portions of these standards. Dots shall be 1/10 inch on center in each cell with 3/10 inch space between corresponding dots in adjacent cells, measured center to center. Dots shall be raised a minimum of 1/40 inch above the background. Braille dots shall be domed or rounded. CBC Section 11B-703.3 and 11B-703.4.

B. Signs:

1. General:
   a. Acrylic Sheet: ASTM D4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing) laminated plastic, color as selected by Architect; engraving 1/32 inch deep in contrasting background color; non-glare finish.
   b. Size: 1/8 inch thick; as shown.
   c. Letters: Uppercase 3/4 inch high, minimum; style as selected by Architect.
   d. Symbols: International style.
2. Room Identification: Per CBC 11B-703.4.
3. Capacity Signs:
   a. General: Per CBC; Typical 1/8 inch thick; number of occupants to be determined by the Architect for each room, where required.

b. Maximum Number - General: "The number of people permitted in this room shall not exceed ___ by order of the State Fire Marshal." Number of occupants as shown on the Drawings.
c. At Entry Doors: “This Door to Remain Unlocked During Business Hours.”

4. Toilet Room Door Signs:
   a. General: Per CBC Section 11B-703.6; 1/4 inch thick with eased edges, with raised letters and braille, as shown. Background color to contrast with door color. Per CBC Section 11B-703.7.2.6.4, edges shall be eased or rounded at 1/16 inch minimum, or chamfered at 1/8 inch maximum; vertices shall be radiused between 1/8 inch minimum and 1/4 inch maximum.
   b. All-Gender: 12 inch diameter circle encompassing a triangle with equal sides and vertex up, with the word "ALL GENDER" below symbol.
   c. Side Mounted Signs: Per CBC Section 11B-703.4.
5. Entrance and Exit Signs:
   a. General: Per CBC Section 11B-703.7; 9 inches high x 6 inches wide, 1/4 inch thick, with eased edges.
   b. Entrance: International symbol of accessibility with the word "ENTRANCE" below symbol.
   c. Exit: International symbol of accessibility with the word "EXIT" below symbol, and directional arrow pointing to required exit, where required.
   d. Tactile Exit Signage: As shown.

C. Metal Painted Signs: Baked enamel on galvanized steel.
D. Fasteners: As recommended by manufacturer; tamper-proof screws; anchors where required.
E. Adhesives: As recommended by manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION:
A. Environmental Requirements: Do not install signs when temperature is below 70 degrees F.
B. Examination: Examine conditions of work in place before beginning work; report defects.

3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified. Mounting location shall be determined so that a person may approach within 3 inches of signage without encountering protruding objects or standing within the swing of the door. CBC Section 11B-703.4.
B. Locations: As shown, or as directed by the Architect.
C. Surface Mounted:
   1. Room Identification: As directed, per CBC 11B-703.
   2. Capacity Signs: As directed, per CBC.
   3. Toilet Room Signs: As directed, per CBC Section 11B-703.4.
   4. Entrance and Exit Signs:
      a. General: Per CBC Section 11B-703.4.
      b. Entrance: Provide at each accessible entrance to the building.
      c. Exit: Provide at accessible exits where shown.
      d. Tactile Exit Signage: As shown.
D. Exit Signs: As required; for illuminated exit signs refer to Division 26 - ELECTRICAL.

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Section 10 14 53
SITE AND TRAFFIC SIGNAGE

PART 1 - GENERAL
1.1 SUMMARY: Provide Site and Traffic Signage, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. Americans with Disabilities Act (ADA): Standards.
C. State of California, Department of Transportation (CalTrans): CalTRANS Standard Specifications.
D. U.S. Department of Transportation, Federal Highway Administration (FHWA): Manual Uniform Traffic Control Devices for Streets and Highways.
1.3 SUBMITTALS:
A. General: Submit product data, shop drawings and samples.
B. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Traffic Signage:
1. General: Signs manufactured by Safeway Sign Co.
2. Alternate Manufacturers: Comparable products manufactured by Western Highway Products, Inc., or accepted equal.
3. Plaque Signs: Provide manufacturer's standard silk-screened signs, baked-on enamel applied over reflectorized backing on .125 aluminum sheet.
4. Sign Text:
a. Traffic and Regular Parking Control:
1. General: Regulatory Signs as shown, in compliance with requirements of State of California, Department of Transportation (CalTrans) Standard Specifications and regulations of jurisdictional agencies.
2. Parking Lot Entrance Signs:
a.) General: 17 inches high x 22 inches long, to read:
"Unauthorized vehicles parked in designated accessible spaces, not displaying distinguishing placards or license plates issued for persons with disabilities may be towed away at owner's expense. Towed vehicles may be reclaimed at _____ or by telephoning _____."
b.) Do Not Block: As shown.
3. Stop Signs: Regulatory Signs as shown.
4. Reserved Parking:
a.) General: Identification as shown.
b.) Special Purpose: Motorcycle and electric vehicle recharging where shown.
b. Accessible Parking Control:
1. General: Parking Signs signs in compliance with (CBC), State of California, Department of Transportation (CalTrans) Standard Specifications and regulations of local authorities having jurisdiction.
2. Accessible Parking Signs:
a.) General: 12 inches high and 12 inches wide displaying the international symbol of accessibility; no text.
b.) Van Accessible: 12 inches wide x 18 inches high displaying the international symbol of accessibility; text below the symbol to read "RESERVED PARKING".
c.) Electric Vehicle Charging: 12 inches high and 18 inches wide displaying the international symbol to read "CHARGING POINT" and indicating charging capacity. .
5. Accessories: Provide welded galvanized steel fittings and galvanized or cadmium-plated steel bolts, nuts and washers.
6. Posts:
a. General: Size as shown.
b. Steel Pipe: ASTM A53, Grade B.
c. Galvanizing: Hot dip process per ASTM A153.

7. Fasteners:
   a. General: Tufnut Security Nuts tamper-proof galvanized steel fasteners manufactured by The Tufnut Works; size as shown.
   b. Alternate Manufacturers: Comparable products manufactured by Allegheny Bolt and Screw Corp., or accepted equal.

PART 3 - EXECUTION

3.1 PREPARATION:
   A. Examination: Examine conditions of work in place before beginning work; report defects.
   B. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:
   A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
   B. Site Traffic Signage:
      1. Locations: As shown, or as directed by the Architect.
      2. Post Mounted:
         a. General: Install post in 2,500 psi concrete as shown; refer to Section 03 30 10 - CONCRETE. Attach sign to post with galvanized steel carriage bolt with hex nut and washer; touch up bolt head with paint to match sign background color.
         b. Parking Space Signs: Center on post with bottom of sign 80 inches above paved surface; top of post shall not protrude above top of sign.
         c. Do Not Block: Install as shown.

* * *

Section 10 21 14
PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY: Provide Plastic Toilet Compartments, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM): Hardware standards for handicapped access and materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.

B. Americans with Disabilities Act (ADA):

1. General: Americans with Disabilities Act of 1990, ADA - 42 U.S. Code Chapter 126.
2. ADA Standards for Accessible Design: U.S. Department of Justice, 28 CFR Part 36.

1.3 SUBMITTALS:

A. General: Submit product data, shop drawings and samples.

B. Closeout: Submit maintenance data, extra stock and guarantee.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Manufacture:

1. General: Manufactured by Scranton Products, Inc.
2. Alternate Manufacturers: Comparable products manufactured by Bobrick Washroom Equipment, Inc.
3. Plastic Toilet Partitions: Aria Partitions floor mounted, overhead braced type.
4. Shower Partitions: Shower Stalls floor mounted, overhead braced type.
5. Size: As shown.
6. Fire Resistance: Per ASTM E 84; smoke developed not to exceed 450, flame spread not to exceed 75
7. Color: As selected By the Architect.

B. Panels:

1. General: Manufacturer's standard 1 inch solid plastic; sizes as shown. Prepare panels as required for grab bars and accessories specified under Section 10 28 13 - TOILET ACCESSORIES.
2. Pilasters: Manufacturer's standard.
3. Doors: 24 inches wide, unless otherwise shown; 36 inches wide, minimum, at accessible stalls.
4. Finishes: Manufacturer's standard; color as selected by Architect.

C. Fastenings: Manufacturer's standard; provide exposed fasteners with tamperproof heads.

D. Fittings and Hardware:

1. General: Manufacturer's standard.
2. Wall Brackets: Manufacturer's standard, full height of panel.
3. Hinges: Manufacturer's standard integral hinge system with self closer; hook/door stop mounted minimum 48 inches above finish floor.
4. Door Latch: Slide bolt type with u-shape or wire pulls both sides of door, below the latch. Mount pulls at 30 to 44 inches above finish floor. Refer to CBC Section 11B-604.1.
5. Finishes:
   a. Aluminum: Clear anodized high luster finish.
   b. Stainless Steel: Type 304; polished.

E. Anchors: As recommended by the manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Examination: Examine conditions of work in place before beginning work; report defects.

B. Measurements: Take field measurements; report variance between plan and field dimensions.

C. Protection: Protect partitions until final acceptance. Repair scratches and defects in original finish; replace work damaged beyond repair.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Wall Brackets: Locate wall brackets so holes for wall anchors occur in tile joints. Align brackets at pilasters with brackets at walls.

C. Pilasters: Erect in a rigid manner; straight and plumb, and with horizontal lines level. Conceal field drilling, cutting, and fitting into finished work. Anchor to structure; set floor anchors in full bed of mastic; 1 inch clearance at walls, maximum; conceal pilaster anchoring devices with a pilaster trim, as required.

D. Panels: Fasten to walls and pilasters at not less than 2 points; 1 inch clearance at walls and pilasters, maximum.

E. Fittings and Hardware: Install per manufacturer's instructions.

3.3 ADJUSTMENT: Prior to acceptance, adjust and lubricate moveable parts to assure smooth operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

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Section 10 26 00
WALL PROTECTION

PART 1 - GENERAL
1.1 SUMMARY: Provide Wall and Door Protection, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American National Standards Institute (ANSI)**:** ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People.
B. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
C. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.
1.3 SUBMITTALS:
A. General: Submit product data and samples.
B. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Wall Protection
1. General: Specified products are manufactured by Construction Specialties, Inc.
2. Alternate Manufacturers: Comparable products manufactured by the IPC Door and Wall Protection Systems Division of the InPro Corp., or accepted equal.
3. Corner Guard: Acrovyn Corner Guard, Model No. FS-20; height as shown.
4. Fire Rating: Class A, per UL-723; flame spread 10, smoke developed 350-450.
5. Colors: As selected by the Architect.
B. Fasteners: Manufacturer's standard, and as shown.
C. Adhesive: Manufacturer's standard.

PART 3 - EXECUTION
3.1 PREPARATION:
A. Scheduling: Coordinate the work with wall or partition sections for installation of concealed blocking or anchor devices.
B. Examination: Examine conditions of work in place before beginning work; report defects.
C. Measurements: Take field measurements; report variance between plan and field dimensions.
3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Wall Protection: Install components per manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members. Terminate rails 6 inches short of door openings and intersecting walls.

* * *

Section 10 28 13
TOILET ACCESSORIES

PART 1 - GENERAL
1.1 SUMMARY: Provide Toilet Room Accessories, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. American National Standards Institute (ANSI):
1. ANSI 117.1: Safety Standards for the Handicapped.
2. ANSI Z97.1: Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test.
C. Americans with Disabilities Act (ADA):
1. General: Americans with Disabilities Act of 1990, ADA - 42 U.S. Code Chapter 126.
2. ADA Standards for Accessible Design: U.S. Department of Justice, 28 CFR Part 36.
3. ADA Accessibility Guidelines for Buildings and Facilities (ADAAG):
a. General: Appendix A to Part 1191.
b. Checklist: ADAAG Checklist for Buildings and Facilities.
D. International Sanitary Supply (ISSA): Standards.
E. California Building Code (CBC): Section 1115B.8.
1.3 SUBMITTALS:
A. General: Submit product data and samples.
B. Closeout:
1. General: Submit maintenance data.
2. Guarantee:
a. General: Submit in required form for a period of one (1) year from date of final acceptance by Owner.
b. Welded Stainless Steel Framed Mirrors: Fifteen-year (15) year guarantee against silver spoilage.

PART 2 - PRODUCTS:
2.1 MATERIALS:
A. Manufacture:
1. General: Classic Series manufactured by Bobrick Washroom Equipment, Inc., unless otherwise indicated; key lockable accessories alike.
2. Alternate Manufacturers: Comparable products manufactured by American Specialties, Inc., or accepted equal.
3. Finishes: Type 304 stainless steel; No. 4 satin finish, unless otherwise specified.
4. Templates and Backplates: Furnish to applicable trades as required for each accessory together with location and mounting height.
B. Toilet Accessories:
1. Multi-purpose Units:
a. Paper Towel Dispenser/Waste Receptacle: Model No. B369, recessed.
b. Toilet Seat Cover/Toilet Tissue Dispenser:
1. Side Wall Mounted: Model No. B-3474, recessed.
2. Toilet Partition Mounted: Model No. B-3471.
c. Toilet Seat Cover/Toilet Tissue Dispenser/Sanitary Napkin Disposal:
1. Side Wall Mounted: Model No. B-3574, recessed.
2. Toilet Partition Mounted: Model No. B-3571.
2. Mirrors:
a. General: Mirror glass per ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality q1 mirror select, 1/4 inch thick; sizes as shown.
b. Safety Backing: Clear vinyl backing conforming to ANSI Z97.1-1975 and CPSC 16 CFR 1201 Category II.
3. Framed Mirrors:
a. General: Stainless steel, with countersunk "theftproof" screws.
b. Frame: Model No. B-290; size as shown.

c. Backs: Resilient filler and galvanized steel or hardboard backing plate, without filler; attach with "theftproof" concealed hangers. Corrugated cardboard or other moisture absorbent filler not acceptable.

4. Soap Dispensers: Lavatory mounted; Model No. B-8221; vandal-proof liquid dispenser.
5. Paper Towel Dispensers: Model No. B-262, surface mounted.
6. Grab Bars: Series No. B-5806; 18 gage 1-1/4 inch o.d. stainless steel tubing; size as shown.
7. Toilet Tissue Dispensers: Surface mounted; Model No. B-2888, 2 roll capacity.
8. Toilet Seat Cover Dispensers: Surface mounted; Model No. B-221.
9. Sanitary Napkin Dispenser: ADA compliant Model No. B-3706; semi-recessed, dispensing both feminine napkins and tampons, 50-cent coin operation.
10. Sanitary Napkin Receptacle: Surface mounted; Model No. B-254.
11. Shower Curtain Rod: Model No. B-6107; 1-1/4 inch diameter, length as required.
12. Folding Shower Seats: Model No. B-5191.
13. Soap Dish: Model No. B-4390 recessed.
14. Robe Hooks:
    a. Single: Model No. B-671.
    b. Double: Model No. B-672.
15. Mop and Broom Holder: Model No. B-223, size as shown

C. Fasteners: As recommended by manufacturer; non-corrosive, tamperproof type.

PART 3 - EXECUTION:

3.1 PREPARATION:

A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified. Conceal evidence of drilling, cutting, and fitting to room finish under accessory.
B. Toilet Room Accessories: Install at locations and heights shown, with concealed vandal-proof fasteners where mountings are made without back plates and where accessories are recessed or fastener is exposed to view. Where possible, mount accessories back-to-back. Attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each condition; adhesive installation not permitted.
C. Grab Bars:
    1. General: Anchor grab bars to withstand minimum downward pull of 500 lbs. Secure grab bars to preset mounting plates screwed to studs or backing plate, using brass or stainless steel vandal proof fastenings. Where mounted on toilet partitions, provide back-to-back sleeves per manufacturer's recommendations.
    2. At Toilets: Install per CBC 1115.7.1.3.; accessories shall not be located closer than 1-1/2 inch clear from the tangent point of the grab bar.
D. Mirrors: Install mirrors with concealed fasteners per manufacturers instructions.

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Section 10 44 13
FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.1 SUMMARY: Provide Fire Extinguishers and Cabinets, as shown and specified per Contract Documents.

1.2 REFERENCES:
- A. American National Standards Institute (ANSI):
  1. ANSI/NFPA 10: Portable Fire Extinguishers.
  2. ANSI/UL 711: Rating and Fire Testing of Fire Extinguishers.
- B. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
- C. Intertek Testing Services (ITS): Approval for type, rating and classification of extinguisher.
- D. National Fire Protection Association (NFPA): Fire Extinguisher Standards.
- E. Underwriters Laboratories, Inc. (UL): Listing for type, rating and classification of extinguisher.

1.3 SUBMITTALS:
- A. General: Submit product data.
- B. Certificates: Submit manufacturer's certificate stating that materials meet or exceed specified requirements.
- C. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience; manufacturer approved.

PART 2 - PRODUCTS

2.1 MATERIALS:
- A. Manufacture:
  1. General: Manufactured by the Potter-Roemer.
  2. Alternate Manufacturers: Comparable products manufactured by J.L. Industries Division of the Activar Construction Products Group, or accepted equal.
- B. Extinguishers:
  1. General: Fire fighting devices must be approved by Underwriters Laboratories, Inc., bear UL label, and approved by jurisdictional official.
  2. Wall Mounted:
     a. General: Model No. 2A-20BC.
     b. Wall Bracket: Manufacturer's standard.
- C. Fasteners: As recommended by manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION:
- A. Environmental Requirements: Do not install when temperatures may cause freezing of extinguisher ingredients.
- B. Examination: Examine conditions of work in place before beginning work; report defects.

3.2 INSTALLATION:
- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Cabinets: Where shown; anchor components firmly in place.
- C. Wall Brackets: Install as required by codes and regulations or as shown; anchor components firmly in place.
- D. Extinguishers:
  1. Cabinet: One (1) extinguisher for each cabinet.
  2. Wall Brackets: One (1) extinguisher (portable) for each wall bracket.

3.3 SERVICE: Inspect, charge and tag fire extinguishers not more than ten (10) days prior to occupancy of building by Owner.

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Section 10 51 13
METAL LOCKERS

PART 1 - GENERAL
1.1 SUMMARY: Provide Metal Lockers, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. Americans with Disabilities Act (ADA):
1. General: Americans with Disabilities Act of 1990, ADA - 42 U.S. Code Chapter 126.
2. ADA Standards for Accessible Design: U.S. Department of Justice, 28 CFR Part 36.
1.3 SUBMITTALS:
A. General: Submit roduct data, shop drawings and samples.
B. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.
1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Metal Lockers:
1. General: Manufactured by Salsbury Industries.
2. Alternate Manufacturers: Comparable products manufactured by Lyon Metal Products, Inc., or accepted equal.
3. Construction: Cold rolled steel for doors and door frames; galvanized bottom; cold rolled steel or annealed, specially treated steel for other parts. Provide end fillers as required.
4. Standard: Standard Metal Double Lockers, 12 inches deep x 60 inches high, with standard top and bottom louvered doors.
5. Bases: Legs with closed base, 6 inches high.
6. Finish: Baked enamel; color selected by the Architect.
7. Hardware:
a. General: Manufacturer's standard.
b. Handles: Standard handles for use with padlocks.
c. Hooks: Manufacturer's standard, unless otherwise noted with specific locker type.
d. Number Plates: Manufacturer's standard non-corrodible metal; etched or embossed 3/8 inch high numbers on each locker; sequence numbered as directed by the Architect.
B. Locker Room Bench:
1. General: Manufacturers standard Wood.
2. Bench Tops:
a. General: Manufacturer's standard 1-1/4 inch hardwood; light finish.
b. Size 1: 19-1/2 inch wide x 66 inchs long.
3. Pedestals: Manufacturer's standard; steel for 16-1/2 inch bench height.
C. Fasteners:
1. General: Cadmium plated steel; tamperproof at exposed bolt heads.
2. Washers: Provide lock washers for nuts on moving parts; prevent loosening of nuts.
3. Anchors: As recommended by manufacturer.

PART 3 - EXECUTION
3.1 PREPARATION:
A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.
3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Placement:
1. General: Install lockers plumb, level, secure, rigid and flush. Locate lockers by color as directed. Provide metal filler panels, factory finished to match lockers, as required.
2. Accessible Lockers: Locate where shown.

C. Anchorage:
   1. General: Install with concealed bolts, to solid anchorage; friction clips not acceptable. Secure lockers to walls and base as shown; bolt locker units together. Space fastenings 48 inches on center and anchor through reinforcing plates where required to prevent metal distortion; conceal connections.
   2. Locker Bench: As recommended by manufacturer.
D. Trim: Provide hairline joints flush against adjacent materials or locker components.
E. Ventilation: Provide perforations in backs, tops and shelves to permit ventilation through locker to space behind or above.

3.3 ADJUSTMENT: Prior to acceptance, adjust moveable parts to assure smooth operation.

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Division 11 - EQUIPMENT

Section 11 31 00
RESIDENTIAL APPLIANCES

PART 1 - GENERAL
1.1 SUMMARY: Provide Residential Appliances, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. Americans with Disabilities Act (ADA): Access to Buildings requirements.
C. Association of Home Appliance Manufacturers (AHAM): Standards.
D. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory, Building Material Directory and standards for electrical equipment.
1.3 SUBMITTALS:
A. General: Submit product data and shop drawings.
B. Samples: Submit manufacturer's standard colors.
C. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Residential Appliances:
1. General: Profile Appliances manufactured by the General Electric Co., unless otherwise indicated.
2. Alternate Manufacturers: Comparable products manufactured by the Maytag Co., or accepted equal.
B. Equipment:
1. Microwave Oven: Countertop; Profile Model No. PEM31DFWW, white color.
C. Finish: Colors selected by the Architect.

PART 3 - EXECUTION
3.1 PREPARATION:
A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.
3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Kitchen Equipment: Install as shown; coordinate service connection with Division 22 - PLUMBING and Division 26 - ELECTRICAL.
C. Owner Furnished Items: Verify type and location of items furnished by Owner; provide backing and attachment to structure and connection to services as shown.

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Division 12 - NOT USED

NOT USED

* End Division 12 *

Division 13 - SPECIAL CONSTRUCTION

Section 13 34 20
PRE-ENGINEERED METAL BUILDING

PART 1 - GENERAL
1.1 SUMMARY:
A. Description:
1. General: Provide labor, materials, equipment, appliances, services and supervision necessary to design, furnish, deliver, and install a Pre-engineered Building as shown and/or specified herein, complete and ready for occupancy and use by Owner.
2. Location: As shown.
3. Construction: Provide building constructed to dimensions and configuration shown.
B. Work by Others:
1. Prior Work:
a. General: Work executed prior to the start of the work of this Section, and excluded from this Contract, is as follows:
b. Site Work: Site preparation as shown.
c. Paving: Asphalt concrete, striping, bumpers and parking signage as shown.
d. Concrete: Foundation, floor slabs and walkways as shown.
e. Utilities: Service and final utility connections as shown.
2. Concurrent Work:
a. Plumbing: Refer to Division 22 - PLUMBING.
b. Heating, Ventilating and Air Conditioning (HVAC): Refer to 23 - HEATING, VENTILATING AND AIR CONDITIONING
c. Electrical: Refer to Division 26 - ELECTRICAL.
3. Subsequent Work:
a. General: Work to be executed after completion of the work of this Section, and excluded from this Contract, is as follows:
b. Landscaping: Planting and irrigation.
1.2 REFERENCES:
A. American Institute of Steel Construction (AISC): Steel Construction Manual.
B. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
C. American Welding Society (AWS): AWS D1.1 - Structural Welding Code - Steel.
D. Steel Structures Painting Council (SSPC): Painting Manual.
E. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.
1.3 SUBMITTALS:
A. General: Submit product data.
B. Submittal Drawings:
1. Design and Construction Documents: Refer to Section 01 34 23 - DEFERRED APPROVAL SUBMITTALS.
2. Fees and Permits: Obtain and pay for all permits and service required in installation of this work; arrange for required inspections.
C. Closeout: Submit maintenance data and guarantee in required form for a period of twenty-five (25) year from date of final acceptance by Owner.
1.4 QUALITY ASSURANCE:
A. Qualifications: Fabricator and installer specializing in the work of this Section with minimum five (5) years documented experience.
B. Design-Build Documents: Prepared by a structural engineer registered to practice in the State of California.
C. Preinstallation Meeting:
1. General: Convene preinstallation meeting two (2) weeks before start of installation of metal building system.
2. Attendance: Contractor, Architect, Engineer, installer, and metal building system manufacturer's representative.
3. Discussion: Review materials, installation, protection, and coordination with other work.

D. Testing: Per Section 01 45 23 - TESTING AND INSPECTION SERVICES.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. General: Pre-engineered Building as shown, manufactured by the Varco Pruden Buildings, Inc.
B. Alternate Manufacturers: Comparable products manufactured by Butler Manufacturing Co., or accepted equal.
C. Structural Steel:
   1. General: Widespan Structural System fabricated from steel members as shown per AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings".
   2. Welding: Per AWS "Structural Welding Code".
   3. Connectors and Anchors: Per CBC requirements.
D. Preformed Metal Roofing:
   1. General: Butlerib II Roof System.
   2. Finish: Factory applied fluoropolymer paint system; color as selected by Architect.
   3. Fasteners: Manufacturer's standard; exposed fasteners finished to match panel finish.
E. Preformed Metal Siding:
   1. General: Butlerib II Wall System.
   2. Finish: Factory applied fluoropolymer paint system; color as selected by Architect.
   3. Fasteners: Manufacturer's standard; exposed fasteners finished to match panel finish.
F. Insulation: TBS System with Z-Purlin; R-value per CBC requirements.

2.2 FABRICATION:

A. General: Fabricate per AISC specifications.
B. Exposed Structural Steel: Comply with AISC Architecturally Exposed Structural Steel fabrication requirements.
C. Sheet Metal: Fabricate and assemble sheet metal work in shop per SMACNA Standards and using products as shown in Section's 07 41 13 - METAL ROOF PANELS and 07 42 13 - METAL WALL PANELS; field fabricate only when required by restrictive field conditions.
D. Openings: Fabricate door, window and utility service openings to dimensions as shown, and specified in Section's 08 11 10 - STEEL DOORS AND FRAMES, 08 33 23 - OVERHEAD COILING DOORS, 08 62 00 - UNIT SKYLIGHTS and 08 51 13 - ALUMINUM WINDOWS.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.
C. Delivery: Transport in compliance with requirements for transportation on trailers used for conveyance on railways, public streets and highways.
D. Protection: Protect existing installations from damage. Take measures to prevent damage to existing turf, trees, paving, streets, curbs, walks, lawn sprinkler heads, and existing buildings during construction. Restore and repair any damage caused by work under this Contract to existing facilities without expense to Owner.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, as specified and manufacturers approved erection drawings.
B. Field Modifications:
   1. General: Require approval of metal building system manufacturer and are the responsibility of building erector.
   2. Field Modifications to Truss Purlins: Not allowed, unless indicated on erection drawings furnished by metal building system manufacturer.
C. Structural Steel:
   1. General: Allow for erection loads, and design and provide sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
   2. Fixed Column Bases: Grout flush with floor line after structural steel erection is complete.
D. Preformed Metal Roofing and Siding: Install weathertight; per specified manufacturer's instructions.

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Division 14 to 21 - UNASSIGNED

NOT USED

* End Division 20 *

Division 22 - PLUMBING

Section 22 05 17
SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Sleeves.
2. Sleeve-seal systems.
3. Grout.
1.2 SUBMITTALS
A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS
2.1 SLEEVES
A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.
C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
2.2 SLEEVE-SEAL SYSTEMS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Link Seal Inc.
2. Advance Products & Systems, Inc.
3. CALPICO, Inc.
4. Metraflex Company (The).
5. Pipeline Seal and Insulator, Inc.
6. Proco Products, Inc.
B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
1. Sealing Elements: EPDM-rubber or NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Pressure Plates: Stainless steel.
3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.
2.3 GROUT
A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
B. Characteristics: Nonshrink; recommended for interior and exterior applications.
C. Design Mix: 5000-psi, 28-day compressive strength.
D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION
3.1 SLEEVE INSTALLATION
A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.

1. Sleeves are not required for core-drilled holes.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
   1. Cut sleeves to length for mounting flush with both surfaces.
      a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
   2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.

D. Install sleeves for pipes passing through interior partitions.
   1. Cut sleeves to length for mounting flush with both surfaces.
   2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
   3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Division 07 Section "Joint Sealants."

E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Division 07 Section "Penetration Firestopping."

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.

B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.3 SLEEVE AND SLEEVE-SEAL SCHEDULE

A. Use sleeves and sleeve seals for the following piping-penetration applications:
   1. Exterior Concrete Walls above Grade:
      a. Piping Smaller Than NPS 6: Cast-iron wall sleeves or Galvanized-steel wall sleeves or Galvanized-steel-pipe sleeves.
      b. Piping NPS 6 and Larger: Cast-iron wall sleeves or Galvanized-steel wall sleeves or Galvanized-steel-pipe sleeves.
   2. Exterior Concrete Walls below Grade:
      a. Piping Smaller Than NPS 6: Cast-iron wall sleeves with sleeve-seal system or Galvanized-steel wall sleeves with sleeve-seal system or Galvanized-steel-pipe sleeves with sleeve-seal system.
         1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
      b. Piping NPS 6 and Larger: Cast-iron wall sleeves with sleeve-seal system of Galvanized-steel wall sleeves with sleeve-seal system or Galvanized-steel-pipe sleeves with sleeve-seal system.
         1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
   3. Concrete Slabs-on-Grade:
      a. Piping Smaller Than NPS 6: Cast-iron wall sleeves with sleeve-seal system or Galvanized-steel wall sleeves with sleeve-seal system or Galvanized-steel-pipe sleeves with sleeve-seal system. Cast iron or galvanized sleeve seal fittings allowed if scheduled on drawings.
         1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
      b. Piping NPS 6 and Larger: Cast-iron wall sleeves with sleeve-seal system or Galvanized-steel wall sleeves with sleeve-seal system or Galvanized-steel-pipe sleeves with sleeve-seal system or Galvanized-steel-pipe sleeves.
         1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.

4. Concrete Slabs above Grade:
   a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
   b. Piping NPS 6 and Larger: Galvanized-steel-pipe sleeves.
5. Interior Partitions:
   a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
   b. Piping NPS 6 and Larger: Galvanized-steel-sheet sleeves.

END OF SECTION 22 05 17

Section 220518
ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
1.2 SUMMARY
A. Section Includes:
1. Escutcheons.
2. Floor plates.
1.3 SUBMITTALS
A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS
2.1 ESCUTCHEONS
A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
D. Split-Casting Brass Type: With polished, chrome-plated finish and with concealed hinge and setscrew.
2.2 FLOOR PLATES
A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION
3.1 INSTALLATION
A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of insulated piping and with OD that completely covers opening.
1. Escutcheons for New Piping:
a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
b. Chrome-Plated Piping: One-piece, cast-brass type with polished, chrome-plated finish.
c. Insulated Piping: One-piece, stamped-steel type.
d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
e. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
f. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
g. Bare Piping in Equipment Rooms: One-piece, cast-brass type with polished, chrome-plated finish.
C. Install floor plates for piping penetrations of equipment-room floors.
D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
1. New Piping: One-piece, floor-plate type.
2. Existing Piping: Split-casting, floor-plate type.
3.2 FIELD QUALITY CONTROL
A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 22 05 18

Section 22 05 23
GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Brass ball valves.
   2. Bronze ball valves.
   3. Iron, single-flange butterfly valves.
   4. Bronze swing check valves.
   5. Iron swing check valves.
   6. Iron swing check valves with closure control.
   7. Bronze gate valves.
   8. Iron gate valves.

B. Related Sections:
   1. Division 22 plumbing piping Sections for specialty valves applicable to those Sections only.
   2. Division 22 Section "Identification for Plumbing Piping and Equipment" for valve tags and schedules.
   3. Division 33 water distribution piping Sections for general-duty and specialty valves for site construction piping.

1.2 SUBMITTALS

A. Product Data: For each type of valve indicated.

1.3 QUALITY ASSURANCE

A. ASME Compliance: ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

B. NSF Compliance: NSF 61 for valve materials for potable-water service.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

A. Refer to valve schedule articles for applications of valves.

B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

C. Valve Sizes: Same as upstream piping unless otherwise indicated.

D. Valve Actuator Types:
   1. Gear Actuator: For quarter-turn valves NPS 8 and larger.
   2. Handwheel: For valves other than quarter-turn types.
   3. Handlever: For quarter-turn valves NPS 6 and smaller.

E. Valves in Insulated Piping: With 2-inch stem extensions and the following features:
   1. Gate Valves: With rising stem.
   2. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
   3. Butterfly Valves: With extended neck.

F. Valve-End Connections:
   1. Flanged: With flanges according to ASME B16.1 for iron valves.
   2. Solder Joint: With sockets according to ASME B16.18.
   3. Threaded: With threads according to ASME B1.20.1.

2.2 BRASS BALL VALVES

A. Two-Piece, Full-Port, Brass Ball Valves with Brass Trim:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following.
      a. Crane Co.; Crane Valve Group; Crane Valves.
      b. Crane Co.; Crane Valve Group; Jenkins Valves.
      c. DynaQuip Controls.

d. Flow-Tek, Inc.; a subsidiary of Bray International, Inc.
e. Hammond Valve.
f. Jamesbury; a subsidiary of Metso Automation.
g. Jomar International, LTD.
h. Kitz Corporation.
i. Legend Valve.
j. Marwin Valve; a division of Richards Industries.
k. Milwaukee Valve Company.
l. NIBCO INC.
m. Red-White Valve Corporation.
n. RuB Inc.

2. Description:
a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Forged brass.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Brass.
i. Ball: Chrome-plated brass.
j. Port: Full.

2.3 BRONZE BALL VALVES

A. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. American Valve, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Crane Co.; Crane Valve Group; Crane Valves.
d. Hammond Valve.
e. Lance Valves; a division of Advanced Thermal Systems, Inc.
f. Legend Valve.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Red-White Valve Corporation.
j. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
2. Description:
a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Bronze.
i. Ball: Chrome-plated brass.
j. Port: Full.

2.4 IRON, SINGLE-FLANGE BUTTERFLY VALVES

A. 200 CWP, Iron, Single-Flange Butterfly Valves with EPDM Seat and Aluminum-Bronze Disc:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Cooper Cameron Valves; a division of Cooper Cameron Corporation.
d. Crane Co.; Crane Valve Group; Jenkins Valves.
e. Crane Co.; Crane Valve Group; Stockham Division.

f. DeZurik Water Controls.
g. Flo Fab Inc.
h. Hammond Valve.
i. Kitz Corporation.
j. Legend Valve.
k. Milwaukee Valve Company.
l. NIBCO INC.
m. Norriseal; a Dover Corporation company.
n. Red-White Valve Corporation.
o. Spence Strainers International; a division of CIRCOR International, Inc.
p. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:
a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Aluminum bronze.

B. 200 CWP, Iron, Single-Flange Butterfly Valves with NBR Seat and Aluminum-Bronze Disc:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Cooper Cameron Valves; a division of Cooper Cameron Corporation.
d. Crane Co.; Crane Valve Group; Jenkins Valves.
e. Crane Co.; Crane Valve Group; Stockham Division.
f. DeZurik Water Controls.
g. Flo Fab Inc.
h. Hammond Valve.
i. Kitz Corporation.
j. Legend Valve.
k. Milwaukee Valve Company.
l. NIBCO INC.
m. Norriseal; a Dover Corporation company.
n. Red-White Valve Corporation.
o. Spence Strainers International; a division of CIRCOR International, Inc.
p. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:
a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: NBR.
f. Stem: One- or two-piece stainless steel.
g. Disc: Aluminum bronze.

C. 200 CWP, Iron, Single-Flange Butterfly Valves with EPDM Seat and Ductile-Iron Disc:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. American Valve, Inc.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corporation.
e. Crane Co.; Crane Valve Group; Center Line.

f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Flo Fab Inc.
i. Hammond Valve.
j. Kitz Corporation.
k. Legend Valve.
l. Milwaukee Valve Company.
m. Mueller Steam Specialty; a division of SPX Corporation.
n. NIBCO INC.
o. Norriseal; a Dover Corporation company.
p. Spence Strainers International; a division of CIRCOR International, Inc.
q. Sure Flow Equipment Inc.
r. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:
a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Nickel-plated ductile iron.

D. 200 CWP, Iron, Single-Flange Butterfly Valves with NBR Seat and Ductile-Iron Disc:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. American Valve, Inc.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corporation.
e. Crane Co.; Crane Valve Group; Center Line.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Flo Fab Inc.
i. Hammond Valve.
j. Kitz Corporation.
k. Legend Valve.
l. Milwaukee Valve Company.
m. Mueller Steam Specialty; a division of SPX Corporation.
n. NIBCO INC.
o. Norriseal; a Dover Corporation company.
p. Spence Strainers International; a division of CIRCOR International, Inc.
q. Sure Flow Equipment Inc.
r. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:
a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: NBR.
f. Stem: One- or two-piece stainless steel.
g. Disc: Nickel-plated ductile iron.

2.5 BRONZE SWING CHECK VALVES

A. Class 125, Bronze Swing Check Valves with Bronze Disc:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Crane Co.; Crane Valve Group; Stockham Division.
e. Hammond Valve.
f. Kitz Corporation.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Powell Valves.
j. Red-White Valve Corporation.
k. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
l. Zy-Tech Global Industries, Inc.

2. Description:
a. Standard: MSS SP-80, Type 3.
b. CWP Rating: 200 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: Bronze.

2.6 IRON SWING CHECK VALVES

A. Class 125, Iron Swing Check Valves with Metal Seats:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Kitz Corporation.
f. Legend Valve.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Powell Valves.
j. Red-White Valve Corporation.
k. Sure Flow Equipment Inc.
l. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
m. Zy-Tech Global Industries, Inc.
2. Description:
a. Standard: MSS SP-71, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Clear or full waterway.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged.
f. Trim: Bronze.
g. Gasket: Asbestos free.

2.7 IRON SWING CHECK VALVES WITH CLOSURE CONTROL

A. Class 125, Iron Swing Check Valves with Lever- and Spring-Closure Control:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. NIBCO INC.
2. Description:
a. Standard: MSS SP-71, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Clear or full waterway.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged.
f. Trim: Bronze.

g. Gasket: Asbestos free.
h. Closure Control: Factory-installed, exterior lever and spring.

B. Class 125, Iron Swing Check Valves with Lever- and Weight-Closure Control:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
2. Description:
a. Standard: MSS SP-71, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Clear or full waterway.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged.
f. Trim: Bronze.
g. Gasket: Asbestos free.
h. Closure Control: Factory-installed, exterior lever and weight.

2.8 BRONZE GATE VALVES

A. Class 125, NRS Bronze Gate Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. American Valve, Inc.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Crane Co.; Crane Valve Group; Stockham Division.
e. Hammond Valve.
f. Kitz Corporation.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Powell Valves.
j. Red-White Valve Corporation.
k. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
l. Zy-Tech Global Industries, Inc.
2. Description:
a. Standard: MSS SP-80, Type 1.
b. CWP Rating: 200 psig.
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded or solder joint.
e. Stem: Bronze.
f. Disc: Solid wedge; bronze.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron, bronze, or aluminum.

B. Class 125, RS Bronze Gate Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. American Valve, Inc.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Crane Co.; Crane Valve Group; Stockham Division.
e. Hammond Valve.
f. Kitz Corporation.
g. Milwaukee Valve Company.

h. NIBCO INC.
i. Powell Valves.
j. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
k. Zy-Tech Global Industries, Inc.

2. Description:
a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 200 psig.
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded or solder joint.
e. Stem: Bronze.
f. Disc: Solid wedge; bronze.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron, bronze, or aluminum.

2.9 IRON GATE VALVES

A. Class 125, NRS, Iron Gate Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Flo Fab Inc.
e. Hammond Valve.
f. Kitz Corporation.
g. Legend Valve.
h. Milwaukee Valve Company.
i. NIBCO INC.
j. Powell Valves.
k. Red-White Valve Corporation.
l. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
m. Zy-Tech Global Industries, Inc.
2. Description:
a. Standard: MSS SP-70, Type I.
b. CWP Rating: 200 psig.
c. Body Material: ASTM A 126, gray iron with bolted bonnet.
d. Ends: Flanged.
e. Trim: Bronze.
f. Disc: Solid wedge.
g. Packing and Gasket: Asbestos free.

B. Class 125, OS&Y, Iron Gate Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Flo Fab Inc.
e. Hammond Valve.
f. Kitz Corporation.
g. Legend Valve.
h. Milwaukee Valve Company.
i. NIBCO INC.
j. Powell Valves.
k. Red-White Valve Corporation.
l. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
m. Zy-Tech Global Industries, Inc.
2. Description:
a. Standard: MSS SP-70, Type I.

b. CWP Rating: 200 psig.
c. Body Material: ASTM A 126, gray iron with bolted bonnet.
d. Ends: Flanged.
e. Trim: Bronze.
f. Disc: Solid wedge.
g. Packing and Gasket: Asbestos free.

PART 3 - EXECUTION

3.1 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
B. Locate valves for easy access and provide separate support where necessary.
C. Install valves in horizontal piping with stem at or above center of pipe.
D. Install valves in position to allow full stem movement.
E. Install chainwheels on operators for butterfly, gate and globe valves NPS 4 and larger and more than 96 inches above floor. Extend chains to 60 inches above finished floor.
1. Install swing check valves for proper direction of flow and in horizontal position with hinge pin level.

3.2 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:
1. Shutoff Service: Ball, butterfly, or gate valves.
2. Throttling Service: Globe, ball, or butterfly valves.
3. Pump-Discharge Check Valves:
a. NPS 2 and Smaller: Bronze swing check valves with bronze disc.
b. NPS 2-1/2 and Larger for Domestic Water: Iron swing check valves with lever and weight or with spring.
c. NPS 2-1/2 and Larger for Sanitary Waste and Storm Drainage: Iron swing check valves with lever and weight or spring.
B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.
C. Select valves, except wafer types, with the following end connections:
1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
4. For Steel Piping, NPS 2 and Smaller: Threaded ends.
5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
6. For Steel Piping, NPS 5 and Larger: Flanged ends.

3.4 LOW-PRESSURE, COMPRESSED-AIR VALVE SCHEDULE (150 PSIG OR LESS)

A. Pipe NPS 2 and Smaller:
1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
2. Ball Valves: Two piece, full port, brass or bronze with brass or bronze trim.
3. Bronze Swing Check Valves: Class 125, bronze disc.
4. Bronze Gate Valves: Class 125, NRS or RS.
B. Pipe NPS 2-1/2 and Larger:
1. Iron, Single-Flange Butterfly Valves: 200 CWP, NBR seat, aluminum-bronze or ductile-iron disc.
2. Iron Swing Check Valves: Class 125, metal seats.
3. Iron Gate Valves: Class 125, NRS or OS&Y.

3.5 HIGH-PRESSURE, COMPRESSED-AIR VALVE SCHEDULE (150 TO 200 PSIG)

A. Pipe NPS 2 and Smaller:
   1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
   2. Ball Valves: Two piece, full port, brass or bronze with brass or bronze trim.
   3. Bronze Swing Check Valves: Class 125, bronze disc.
   4. Bronze Gate Valves: Class 125, NRS or RS.

B. Pipe NPS 2-1/2 and Larger:
   1. Iron, Single-Flange Butterfly Valves: 200 CWP, NBR seat, aluminum-bronze or ductile-iron disc.
   2. Iron Swing Check Valves: Class 125, metal seats.
   3. Iron Gate Valves: Class 125, NRS or OS&Y.

3.6 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:
   1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
   2. Bronze Angle Valves: Class 125, bronze disc.
   3. Ball Valves: Two piece, full port, brass or bronze with brass or bronze trim.
   4. Bronze Swing Check Valves: Class 125, bronze disc.
   5. Bronze Gate Valves: Class 125, NRS or RS.
   6. Bronze Globe Valves: Class 125, bronze disc.

B. Pipe NPS 2-1/2 and Larger:
   1. Iron, Single-Flange Butterfly Valves: 200 CWP, EPDM or NBR seat, aluminum-bronze or ductile-iron disc.
   2. Iron Swing Check Valves: Class 125, metal seats.
   3. Iron Swing Check Valves with Closure Control: Class 125, lever and spring or weight.
   4. Iron Gate Valves: Class 125, NRS or OS&Y.
   5. Iron Globe Valves: Class 125.

END OF SECTION 220523

Section 22 05 29
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Metal pipe hangers and supports.
   2. Trapeze pipe hangers.
   3. Metal framing systems.
   4. Thermal-hanger shield inserts.
   5. Fastener systems.
   6. Pipe stands.
   7. Pipe positioning systems.
   8. Equipment supports.

B. Related Sections:
   1. Division 05 Section "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
   2. Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment" for vibration isolation devices.

1.3 DEFINITIONS

A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE 7 with all modifications incorporated in 2010 CBC.
   1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
   2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
   3. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:
   1. Trapeze pipe hangers.
   2. Metal framing systems.
   3. Pipe stands.
   4. Equipment supports.

C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
   1. Detail fabrication and assembly of trapeze hangers.
   2. Design Calculations: Calculate requirements for designing trapeze hangers.

D. Welding certificates.

1.6 QUALITY ASSURANCE

A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:
1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel or stainless steel.

B. Stainless-Steel Pipe Hangers and Supports:
1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:
1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel or stainless steel.

2.2 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Allied Tube & Conduit.
b. Cooper B-Line, Inc.
c. Flex-Strut Inc.
d. Unistrut Corporation; Tyco International, Ltd.
2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
3. Standard: MFMA-4.
4. Channels: Continuous slotted steel channel with inturned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of **carbon steel**.
7. Metallic Coating: Hot-dipped galvanized.

2.4 THERMAL-HANGER SHIELD INSERTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Carpenter & Paterson, Inc.
2. Clement Support Services.
3. ERICO International Corporation.
4. National Pipe Hanger Corporation.
5. PHS Industries, Inc.
6. Pipe Shields, Inc.; a subsidiary of Piping Technology & Products, Inc.
7. Piping Technology & Products, Inc.
8. Rilco Manufacturing Co., Inc.
9. Value Engineered Products, Inc.

B. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig (688-kPa) or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig (862-kPa) minimum compressive strength and vapor barrier.
C. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig (688-kPa) or ASTM C 552, Type II cellular glass with 100-psig (688-kPa) or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig (862-kPa) minimum compressive strength.
D. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
E. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
F. Insert Length: Extend 2 inches (50 mm) beyond sheet metal shield for piping operating below ambient air temperature.

2.5 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
B. Mechanical-Expansion Anchors: Insert-wedge-type, [**zinc-coated**] [**stainless-**] steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.6 PIPE STANDS

A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.
D. High-Type, Single-Pipe Stand:
    1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
    2. Base: Stainless steel.
    3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
    4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.
E. High-Type, Multiple-Pipe Stand:
    1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
    2. Bases: One or more; plastic.
    3. Vertical Members: Two or more protective-coated-steel channels.
    4. Horizontal Member: Protective-coated-steel channel.
    5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.
F. Curb-Mounting-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.7 PIPE POSITIONING SYSTEMS

A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.

2.8 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.9 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
    1. Properties: Nonstaining, noncorrosive, and nongaseous.
    2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
   1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
   2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Fiberglass Pipe-Hanger Installation: Comply with applicable portions of MSS SP-69 and MSS SP-89. Install hangers and attachments as required to properly support piping from building structure.

D. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

E. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

F. Fastener System Installation:
   1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches (100 mm) thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
   2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

G. Pipe Stand Installation:
   1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
   2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. See Division 07 Section "Roof Accessories" for curbs.

H. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture. See Division 22 plumbing fixture Sections for requirements for pipe positioning systems for plumbing fixtures.

I. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

J. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

K. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

L. Install lateral bracing with pipe hangers and supports to prevent swaying.

M. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

N. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

O. Insulated Piping:
   1. Attach clamps and spacers to piping.
      a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
      b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
      c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
   2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.

3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
   a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.
4. Shield Dimensions for Pipe: Not less than the following:
   a. NPS 1/4 to NPS 3-1/2 (DN 8 to DN 90): 12 inches (305 mm) long and 0.048 inch (1.22 mm) thick.
   b. NPS 4 (DN 100): 12 inches (305 mm) long and 0.06 inch (1.52 mm) thick.
5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
   1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils (0.05 mm).
B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 09 painting Sections.
C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
E. Use carbon-steel pipe hangers and supports or metal trapeze pipe hangers and metal framing systems and attachments for general service applications.
F. Use stainless-steel pipe hangers attachments for hostile environment applications.

G. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.
H. Use padded hangers for piping that is subject to scratching.
I. Use thermal-hanger shield inserts for insulated piping and tubing.
J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).
   2. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36 (DN 20 to DN 900), requiring clamp flexibility and up to 4 inches (100 mm) of insulation.
   3. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 (DN 15 to DN 600) if little or no insulation is required.
   4. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4 (DN 15 to DN 100), to allow off-center closure for hanger installation before pipe erection.
   5. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8 (DN 20 to DN 200).
   6. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
   7. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
   8. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
   9. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8 (DN 10 to DN 200).
K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24 (DN 24 to DN 600).
   2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 (DN 20 to DN 600) if longer ends are required for riser clamps.
L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
   2. Steel Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.
   3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
   4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
   5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F (49 to 232 deg C) piping installations.
M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
   2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
   3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
   4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
   5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
   6. C-Clamps (MSS Type 23): For structural shapes.
   7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
   8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.

9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
12. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.

N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

O. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

P. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

Q. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

R. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION 22 05 29

Section 22 05 53
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.

1.2 SUBMITTAL

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:
1. Material and Thickness: Brass, 0.032-inch or Stainless steel, 0.025-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
4. Fasteners: Stainless-steel rivets or self-tapping screws.
5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch or 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: Black or Red.
3. Background Color: White.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless-steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch or 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Black.

C. Background Color: Red.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
G. Fasteners: Stainless-steel rivets or self-tapping screws.
H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.
C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
    1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
    2. Lettering Size: At least 1-1/2 inches high.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.
B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
    1. Near each valve and control device.
    2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
    3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
    4. At access doors, manholes, and similar access points that permit view of concealed piping.
    5. Near major equipment items and other points of origination and termination.
    6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
    7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
B. Pipe Label Color Schedule:
    1. Low-Pressure, Compressed-Air Piping:
        a. Background Color: Yellow.
        b. Letter Color: Black.
    2. Medium-Pressure, Compressed-Air Piping:
        a. Background Color: Yellow.
        b. Letter Color: Black.
    3. Domestic Cold Water Piping:
        a. Background Color: Blue.
        b. Letter Color: White.
    4. Domestic Hot Water Piping:
        a. Background Color: Red.

b. Letter Color: White.

5. Sanitary Waste and Storm Drainage Piping:
   a. Background Color: Yellow.
   b. Letter Color: Black.
6. Laboratory Bell Prover apparatus water piping (downstream of backflow preventer):
   a. Background Color: Light Blue.
   b. Letter Color: Black.
7. Laboratory Water Meter Testing apparatus water piping (downstream of backflow preventer):
   a. Background Color: Light Blue.
   b. Letter Color: Black

END OF SECTION 22 05 53

Section 22 11 16
DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Under-building slab and aboveground domestic water pipes, tubes, fittings, and specialties inside the building.
   2. Specialty valves.
   3. Flexible connectors.
   4. Water meters furnished by utility company for installation by Contractor.
   5. Water meters.

1.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Domestic water piping and support and installation shall withstand effects of earthquake motions determined according to ASCE 7 with all modifications incorporated in 2019 CBC.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
B. Comply with NSF 61 for potable domestic water piping and components.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Type L or Type K.
   1. Cast-Copper Solder-Joint Fittings: ASME B16.18, pressure fittings.
   2. Wrought-Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
   3. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
   4. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
B. Soft Copper Tube: ASTM B 88, Type K water tube, annealed temper.
   1. Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.

2.3 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free, unless otherwise indicated; full-face or ring type unless otherwise indicated.
B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
D. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

2.4 SPECIALTY VALVES

A. Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping" for general-duty metal valves.
B. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for balancing valves, drain valves, backflow preventers, and vacuum breakers.

2.5 TRANSITION FITTINGS

A. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
B. Sleeve-Type Transition Coupling: AWWA C219.

2.6 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.

B. Dielectric Unions:
1. Description:
a. Pressure Rating: 150 psig minimum at 180 deg F.
b. End Connections: Solder-joint copper alloy and threaded ferrous.

C. Dielectric Flanges:
1. Description:
a. Factory-fabricated, bolted, companion-flange assembly.
b. Pressure Rating: 175 psig minimum.
c. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

D. Dielectric-Flange Kits:
1. Description:
a. Nonconducting materials for field assembly of companion flanges.
b. Pressure Rating: 150 psig.
c. Gasket: Neoprene or phenolic.
d. Bolt Sleeves: Phenolic or polyethylene.
e. Washers: Phenolic with steel backing washers.

E. Dielectric Couplings:
1. Description:
a. Galvanized-steel coupling.
b. Pressure Rating: 300 psig at 225 deg F.
c. End Connections: Female threaded.
d. Lining: Inert and noncorrosive, thermoplastic.

F. Dielectric Nipples:
1. Description:
a. Electroplated steel nipple complying with ASTM F 1545.
b. Pressure Rating: 300 psig at 225 deg F.
c. End Connections: Male threaded or grooved.
d. Lining: Inert and noncorrosive, propylene.

2.7 FLEXIBLE CONNECTORS

A. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.
1. Working-Pressure Rating: Minimum 200 psig.
2. End Connections NPS 2 and Smaller: Threaded copper pipe or plain-end copper tube.
3. End Connections NPS 2-1/2 and Larger: Flanged copper alloy.

B. Stainless-Steel-Hose Flexible Connectors: Corrugated-stainless-steel tubing with stainless-steel wire-braid covering and ends welded to inner tubing.
1. Working-Pressure Rating: Minimum 200 psig.
2. End Connections NPS 2 and Smaller: Threaded steel-pipe nipple.
3. End Connections NPS 2-1/2 and Larger: Flanged steel nipple.

2.8 WATER METERS

A. Displacement-Type Water Meters:
1. Description:
a. Standard: AWWA C700.
b. Pressure Rating: 150-psig working pressure.
c. Body Design: Nutating disc; totalization meter.
d. Registration: In gallons or cubic feet as required by utility.
e. Case: Bronze.
f. End Connections: Threaded.

B. Compound-Type Water Meters:
1. Description:
a. Standard: AWWA C702.

b. Pressure Rating: 150-psig working pressure.
c. Body Design: With integral mainline and bypass meters; totalization meter.
d. Registration: In gallons or cubic feet as required by utility company.
e. Case: Bronze.
f. Pipe Connections: Flanged.

C. Remote Registration System: Direct-reading type complying with AWWA C706 or Encoder type complying with AWWA C707; modified with signal transmitting assembly, low-voltage connecting wiring, and remote register assembly as required by utility company.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Comply with requirements in Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

3.2 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."
C. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside the building at each domestic water service entrance. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for drain valves and strainers.
D. Install shutoff valve immediately upstream of each dielectric fitting.
E. Install water-pressure-reducing valves downstream from shutoff valves. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for pressure-reducing valves.
F. Install domestic water piping level and plumb.
G. Rough-in domestic water piping for water-meter installation according to utility company's requirements.
H. Install seismic restraints on piping. Comply with requirements in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment" for seismic-restraint devices.
I. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
J. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
K. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
L. Install piping adjacent to equipment and specialties to allow service and maintenance.
M. Install piping to permit valve servicing.
N. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than system pressure rating used in applications below unless otherwise indicated.
O. Install piping free of sags and bends.
P. Install fittings for changes in direction and branch connections.
Q. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
R. Install pressure gages on suction and discharge piping from each plumbing pump and packaged booster pump. Retain first paragraph below if hot-water circulation pumps are controlled by thermostats.
S. Install thermostats in hot-water circulation piping and at circulating hot water return pump.
T. Install thermometers on inlet and outlet piping from each water heater.
U. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."
V. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."

W. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 22 Section "Escutcheons for Plumbing Piping."

3.3 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

D. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Brazed Joints" Chapter.

E. Soldered Joints: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

F. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.

G. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.4 VALVE INSTALLATION

A. General-Duty Valves: Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping" for valve installations.

B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball valves for piping NPS 2 and smaller. Use butterfly valves for piping NPS 2-1/2 and larger.

C. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping. Drain valves are specified in Division 22 Section "Domestic Water Piping Specialties."
   1. Hose-End Drain Valves: At low points in water mains, risers, and branches.
   2. Stop-and-Waste Drain Valves: Instead of hose-end drain valves where indicated.

D. Install balancing valve in each hot-water circulation return branch and discharge side of each pump and circulator. Set balancing valves partly open to restrict but not stop flow. Use ball valves for piping NPS 2 and smaller and butterfly valves for piping NPS 2-1/2 and larger. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for balancing valves.

3.5 TRANSITION FITTING INSTALLATION

A. Install transition couplings at joints of dissimilar piping.

B. Transition Fittings in Underground Domestic Water Piping:
   1. NPS 1-1/2 and Smaller: Fitting-type coupling.
   2. NPS 2 and Larger: Sleeve-type coupling.

C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition fittings or unions.

3.6 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric unions.

C. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges.

D. Dielectric Fittings for NPS 5 to NPS : Use dielectric flange kits.

3.7 FLEXIBLE CONNECTOR INSTALLATION

A. Install flexible connectors in suction and discharge piping connections to each domestic water pump and in suction and discharge manifold connections to each domestic water booster pump.

B. Install bronze-hose flexible connectors in copper domestic water tubing.

3.8 WATER METER INSTALLATION

A. Rough-in domestic water piping for water meter installation, and install water meters according to utility company's requirements.
B. Water meters may be furnished and installed by utility company, field coordinate.
C. Install water meters according to AWWA M6, utility company's requirements, and the following:
D. Install displacement-type water meters with shutoff valve on water-meter inlet. Install valve on water-meter outlet and valved bypass around meter unless prohibited by authorities having jurisdiction.
E. Install compound-type water meters with shutoff valves on water-meter inlet and outlet and on valved bypass around meter. Support meters, valves, and piping on brick or concrete piers.
F. Install remote registration system according to standards of utility company and of authorities having jurisdiction.

3.9 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment" for seismic-restraint devices.
B. Comply with requirements in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support products and installation.
    1. Vertical Piping: MSS Type 8 or 42, clamps.
    2. Individual, Straight, Horizontal Piping Runs:
        a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
        b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
    3. Base of Vertical Piping: MSS Type 52, spring hangers.
C. Support vertical piping and tubing at base and at each floor.
D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
    1. NPS 3/4 and smaller: 60 inches with 3/8-inch rod.
    2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
    3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
    4. NPS 2-1/2: 108 inches with 1/2-inch rod.
    5. NPS 3 to NPS 4: 10 feet with 1/2-inch rod.
F. Install supports for vertical copper tubing every 10 feet.
G. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.10 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.
B. Install piping adjacent to equipment and machines to allow service and maintenance.
C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
    1. Domestic Water Booster Pumps: Cold-water suction and discharge piping.
    2. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
    3. Plumbing Fixtures: Cold- and hot-water supply piping in sizes indicated, but not smaller than required by plumbing code. Comply with requirements in Division 22 plumbing fixture Sections for connection sizes.
    4. Equipment: Cold- and hot-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.11 IDENTIFICATION

A. Identify system components. Comply with requirements in Division 22 Section "Identification for Plumbing Piping and Equipment" for identification materials and installation.
B. Label pressure piping with system operating pressure.

3.12 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Piping Inspections:
   1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
   2. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
      a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
      b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
   3. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
   4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

C. Piping Tests:
   1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
   2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
   3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
   4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
   5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
   6. Prepare reports for tests and for corrective action required.

D. Domestic water piping will be considered defective if it does not pass tests and inspections. See Division 01 Section "Quality Requirements" for retesting and reinspecting requirements. See Division 01 Section "Execution" for requirements for correcting the Work.

E. Prepare test and inspection reports.

3.13 CLEANING

A. Clean and disinfect potable and non-potable domestic water piping per 2019 CPC and as follows:
   1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
   2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
      a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
      b. Fill and isolate system according to either of the following:
         1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 48 hours.
         2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for six (6) hours.
      c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
      d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

B. Prepare and submit reports of purging and disinfecting activities.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.14 PIPING SCHEDULE

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.

C. Under-building-slab, domestic water, building service piping, NPS 4 and smaller, shall be the following:

1. Soft copper tube, ASTM B 88, Type K wrought-copper solder-joint fittings; and brazed joints.

D. Aboveground domestic water piping, NPS 4 and smaller, shall be the following:

1. Hard copper tube, ASTM B 88, Type L; cast- or wrought- copper solder-joint fittings; and brazed or soldered joints.

E. Aboveground domestic water piping, NPS 5 to NPS 6, shall be one of the following:

1. Hard copper tube, ASTM B 88, Type L or Type K; cast- or wrought- copper solder-joint fittings; and brazed or soldered joints.

3.15 VALVE SCHEDULE

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use ball or gate valves for piping NPS 3 and smaller.
2. Throttling Duty: Use ball or globe valves for piping NPS 2 and smaller. Use ball valves with flanged ends for piping NPS 2-1/2 and larger.
3. Hot-Water Circulation Piping, Balancing Duty: Memory-stop balancing valves or ball valves as specified on drawings.
4. Drain Duty: Hose-end drain valves.

B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

C. Iron grooved-end valves may be used with grooved-end piping.

END OF SECTION 22 11 16

Section 22 11 19
DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following domestic water piping specialties:
   1. Vacuum breakers.
   2. Backflow preventers.
   3. Water pressure-reducing valves.
   4. Balancing valves.
   5. Temperature-actuated water mixing valves.
   6. Strainers.
   7. Hose bibbs.
   8. Wall hydrants.
   9. Drain valves.
   10. Water hammer arresters.
   11. Trap-seal primer valves.

B. See Division 22 Section "Domestic Water Piping" for water meters.

1.2 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig, unless otherwise indicated.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

C. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. NSF Compliance:
   1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
   2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

PART 2 - PRODUCTS

2.1 VACUUM BREAKERS

A. Pipe-Applied, Atmospheric-Type Vacuum Breakers:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Ames Co.
      b. FEBCO; SPX Valves & Controls.
      c. Watts Industries, Inc.; Water Products Div.
      d. Zurn Plumbing Products Group; Wilkins Div.
   2. Standard: ASSE 1001.
   3. Size: NPS 1/4 to NPS 3, as required to match connected piping.
   4. Body: Bronze.
   5. Inlet and Outlet Connections: Threaded.
   6. Finish: Rough bronze or Chrome plated.

2.2 BACKFLOW PREVENTERS

A. Reduced-Pressure-Principle Backflow Preventers:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Ames Co.
      b. FEBCO; SPX Valves & Controls.
      c. Watts Industries, Inc.; Water Products Div.
      d. Zurn Plumbing Products Group; Wilkins Div.
   2. Standard: ASSE 1013.
   3. Operation: Continuous-pressure applications.

4. Pressure Loss: 12 psig maximum, through middle 1/3 of flow range.
5. Size: See drawings
6. Design Flow Rate: See drawings.
7. Selected Unit Flow Range Limits: See drawings.
8. Pressure Loss at Design Flow Rate: See drawings.
9. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or stainless steel for NPS 2-1/2 and larger.
10. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
11. Configuration: See drawings.
12. Accessories:
    a. Valves: Ball type with threaded ends on inlet and outlet of NPS 2 and smaller; outside screw and yoke gate-type with flanged ends on inlet and outlet of NPS 2-1/2 and larger.
    b. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.

B. Double-Check Backflow-Prevention Assemblies:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Ames Co.
    b. FEBCO; SPX Valves & Controls.
    c. Watts Industries, Inc.; Water Products Div.
    d. Zurn Plumbing Products Group; Wilkins Div.
2. Standard: ASSE 1015.
3. Operation: Continuous-pressure applications, unless otherwise indicated.
4. Pressure Loss: 5 psig maximum, through middle 1/3 of flow range.
5. Size: See drawings.
6. Design Flow Rate: See drawings.
7. Selected Unit Flow Range Limits: See drawings.
8. Pressure Loss at Design Flow Rate: See drawings.
9. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved or stainless steel for NPS 2-1/2 and larger.
10. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
11. Configuration: See drawings.
12. Accessories:
    a. Valves: Ball type with threaded ends on inlet and outlet of NPS 2 and smaller; outside screw and yoke gate-type with flanged ends on inlet and outlet of NPS 2-1/2 and larger.

C. Backflow-Preventer Test Kits:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Conbraco Industries, Inc.
    b. FEBCO; SPX Valves & Controls.
    c. Flomatic Corporation.
    d. Watts Industries, Inc.; Water Products Div.
    e. Zurn Plumbing Products Group; Wilkins Div.
2. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

2.3 WATER PRESSURE-REDUCING VALVES

A. Water Regulators:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Watts Industries, Inc.; Water Products Div.
    b. Zurn Plumbing Products Group; Wilkins Div.
2. Standard: ASSE 1003.
3. Pressure Rating: Initial working pressure of 150 psig.
4. Size: See drawings.
5. Design Flow Rate: See drawings.

6. Design Inlet Pressure: See drawings.
7. Design Outlet Pressure Setting: See drawings.
8. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved for NPS 2-1/2 and NPS 3.
9. Valves for Booster Heater Water Supply: Include integral bypass.
10. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and NPS 3.

2.4 BALANCING VALVES

A. Memory-Stop Balancing Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Div.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Bell and Gossett
2. Standard: MSS SP-110 for two-piece, copper-alloy ball valves.
3. Pressure Rating: 400-psig minimum CWP.
4. Size: NPS 2 or smaller.
5. Body: Copper alloy.
6. Port: Standard or full port.
7. Ball: Chrome-plated brass.
8. Seats and Seals: Replaceable.
9. End Connections: Solder joint or threaded.
10. Handle: Vinyl-covered steel with memory-setting device.

2.5 TEMPERATURE-ACTUATED WATER MIXING VALVES

A. Water-Temperature Limiting Devices:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following (see drawings for fixture schedule with model numbers):
a. Leonard Valve Company.
b. Powers; a Watts Industries Co.
c. Symmons Industries, Inc.
d. Taco, Inc.
e. Watts Industries, Inc.; Water Products Div.
f. Zurn Plumbing Products Group; Wilkins Div.
2. Standard: ASSE 1017.
3. Pressure Rating: 125 psig.
4. Type: Thermostatically controlled water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
6. Connections: Threaded with unions on inlets and outlet.
7. Accessories: Check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
8. Tempered-Water Setting: 100 deg F. Setting shall be adjustable, see drawings.
9. Valve Finish: Chrome plated or Rough bronze.

B. Primary, Thermostatic, Water Mixing Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following (see drawings for fixture schedule with model numbers):
a. Leonard Valve Company.
b. Powers; a Watts Industries Co.
c. Symmons Industries, Inc.
2. Standard: ASSE 1017.
3. Pressure Rating: 125 psig.
4. Type: Exposed-mounting or Cabinet-type, thermostatically controlled water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
6. Connections: Threaded with unions on inlets and outlet.

7. Accessories: Manual temperature control, check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
8. Valve Pressure Rating: 125 psig minimum, unless otherwise indicated.
9. Tempered-Water Setting: 100 deg F. Setting shall be adjustable, see drawings.
10. Valve Finish: Polished, chrome plated or Rough bronze.
11. Piping Finish: Chrome plated or Copper.
12. Cabinet: Factory-fabricated, stainless steel, for recessed or surface mounting and with hinged, stainless-steel door.

2.6 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers:
1. Pressure Rating: 125 psig minimum, unless otherwise indicated.
2. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or FDA-approved, epoxy coating for NPS 2-1/2 and larger.
3. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
4. Screen: Stainless steel with round perforations, unless otherwise indicated.
5. Perforation Size:
   a. Strainers NPS 2 and Smaller: 0.020 inch.
   b. Strainers NPS 2-1/2 to NPS 4: 0.045 inch.
   c. Strainers NPS 5 and Larger: 0.125 inch.
6. Drain: Factory-installed, hose-end drain valve.

2.7 HOSE BIBBS

A. Hose Bibbs (see drawings for fixture schedule with model numbers):
1. Standard: ASME A112.18.1 for sediment faucets.
2. Body Material: Bronze.
3. Seat: Bronze, replaceable.
4. Supply Connections: NPS 1/2 or NPS 3/4 threaded or solder-joint inlet.
5. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
6. Pressure Rating: 125 psig.
7. Vacuum Breaker: Integral or field-installation, nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
8. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
9. Finish for Service Areas: Chrome or nickel plated.
10. Finish for Finished Rooms: Chrome or nickel plated.
11. Operation for Equipment Rooms: Wheel handle or Operating key.
12. Operation for Service Areas: Wheel handle or Operating key.
13. Operation for Finished Rooms: Wheel handle or Operating key.
14. Include operating key with each operating-key hose bibb.
15. Include wall flange with each chrome- or nickel-plated hose bibb.

2.8 WALL HYDRANTS

A. Nonfreeze Wall Hydrants:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following (see drawings for fixture schedule with model numbers):
   a. Josam Company.
   b. MIFAB, Inc.
   c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   d. Tyler Pipe; Wade Div.
   e. Watts Drainage Products Inc.
   f. Zurn Plumbing Products Group.
2. Standard: ASME A112.21.3M for concealed or exposed-outlet, self-draining wall hydrants as specified on drawings.
3. Pressure Rating: 125 psig.
4. Operation: Loose key.
5. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
6. Inlet: NPS 3/4 or NPS 1.

7. Outlet: Concealed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
8. Box: Deep, flush mounting with cover.
9. Box and Cover Finish: Polished nickel bronze or Chrome plated.
10. Outlet: Exposed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
11. Nozzle and Wall-Plate Finish: Polished nickel bronze or Rough bronze.
12. Operating Keys(s): Two with each wall hydrant.

B. Vacuum Breaker Wall Hydrants:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following (see drawings for fixture schedule with model numbers):
a. Smith, Jay. R. Mfg. Co.; Division of Smith Industries, Inc.
b. Watts Industries, Inc.; Water Products Div.
c. Woodford Manufacturing Company.
d. Zurn Plumbing Products Group; Light Commercial Operation.
2. Standard: ASSE 1019, Type A or Type B.
3. Type: Freeze-resistant, automatic draining with integral air-inlet valve.
4. Classification: Type B, for automatic draining with hose removed or with hose attached and nozzle closed.
5. Pressure Rating: 125 psig.
6. Operation: Loose key or wheel handle.
7. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
8. Inlet: NPS 1/2 or NPS 3/4.
9. Outlet: Exposed with garden-hose thread complying with ASME B1.20.7.

2.9 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:
1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: 400-psig minimum CWP.
3. Size: NPS 3/4.
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded or solder joint.
9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

2.10 WATER HAMMER ARRESTERS

A. Water Hammer Arresters :
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following (see drawings for fixture schedule with model numbers):
a. Josam Company.
b. MIFAB, Inc.
c. PPP Inc.
d. Sioux Chief Manufacturing Company, Inc.
e. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
f. Tyler Pipe; Wade Div.
g. Watts Drainage Products Inc.
h. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Metal bellows or Copper tube with piston.
4. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

2.11 TRAP-SEAL PRIMER VALVES

A. Supply-Type, Trap-Seal Primer Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following (see drawings for fixture schedule with model numbers):

a. MIFAB, Inc.
b. PPP Inc.
c. Sioux Chief Manufacturing Company, Inc.
d. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
e. Watts Industries, Inc.; Water Products Div.

2. Standard: ASSE 1018.
3. Pressure Rating: 125 psig minimum.
4. Body: Bronze.
5. Inlet and Outlet Connections: NPS 1/2 threaded, union, or solder joint.
6. Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.
7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished. Chrome plated if exposed.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install backflow preventers in each water supply to mechanical or laboratory equipment and systems and to other equipment and water systems that may be sources of contamination to the building domestic water system. Comply with authorities having jurisdiction.
   1. Locate backflow preventers in same room as connected equipment or system.
   2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.
   3. Do not install bypass piping around backflow preventers.

B. Install water regulators with inlet and outlet shutoff valves and bypass with memory-stop balancing valve. Install pressure gages on inlet and outlet.

C. Install balancing valves in locations where they can easily be adjusted.

D. Install temperature-actuated water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
   1. Install thermometers and water regulators if specified.
   2. Install cabinet-type units recessed in or surface mounted on wall as specified.

E. Install Y-pattern strainers for water on supply side of each control valve, or water pressure-reducing valve, or solenoid valve, and pump.

F. Install water hammer arresters in water piping according to PDI-WH 201.

G. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

H. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping and specialties.

I. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
   1. Intermediate atmospheric-vent backflow preventers.
   2. Reduced-pressure-principle backflow preventers.
   3. Double-check backflow-prevention assemblies.
   4. Water pressure-reducing valves.
   5. Primary, thermostatic, water mixing valves.
   6. Supply-type, trap-seal primer valves.

J. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and prepare test reports:
   1. Test each reduced-pressure-principle backflow preventer and double-check backflow-prevention assembly according to authorities having jurisdiction and the device's reference standard.

B. Remove and replace malfunctioning domestic water piping specialties and retest as specified above.

3.3 ADJUSTING

A. Set field-adjustable pressure set points of water pressure-reducing valves.
B. Set field-adjustable flow of balancing valves.
C. Set field-adjustable temperature set points of temperature-actuated water mixing valves.

END OF SECTION 22 11 19

Section 22 13 16
SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Pipe, tube, and fittings.
   2. Specialty pipe fittings.

1.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Soil, waste, and vent piping and support and installation shall withstand the effects of earthquake motions determined according to ASCE 7 with all modifications incorporated in 2019 CBC.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Seismic Qualification Certificates: For waste and vent piping, accessories, and components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Detailed description of piping anchorage devices on which the certification is based and their installation requirements.
C. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
B. Comply with NSF/ANSI 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 74, Service class.
B. Gaskets: ASTM C 564, rubber.

2.3 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301.
B. CISPI, Hubless-Piping Couplings:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. ANACO-Husky.
      b. Dallas Specialty & Mfg. Co.
      c. Fernco Inc.
      d. Matco-Norca, Inc.
      e. MIFAB, Inc.
      f. Mission Rubber Company; a division of MCP Industries, Inc.
      g. Stant.
      h. Tyler Pipe.
   2. Standards: ASTM C 1277 and CISPI 310.
   3. Description: Stainless-steel corrugated shield with minimum four stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
C. Heavy-Duty, Hubless-Piping Couplings:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. ANACO-Husky.
      b. Clamp-All Corp.
      c. Dallas Specialty & Mfg. Co.

d. MIFAB, Inc.
e. Mission Rubber Company; a division of MCP Industries, Inc.
f. Stant.
g. Tyler Pipe.

2. Standards: ASTM C 1277 and ASTM C 1540.
3. Description: Stainless-steel shield with minimum four stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.4 COPPER TUBE AND FITTINGS

A. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.
B. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.
C. Copper Flanges: ASME B16.24, Class 150, cast copper with solder-joint end.
1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
D. Solder: ASTM B 32, lead free with ASTM B 813, water-flushable flux.

2.5 SPECIALTY PIPE FITTINGS

A. Transition Couplings:
1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
3. Unshielded, Nonpressure Transition Couplings:
a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1) Dallas Specialty & Mfg. Co.
2) Fernco Inc.
3) Mission Rubber Company; a division of MCP Industries, Inc.
4) Plastic Oddities; a division of Diverse Corporate Technologies, Inc.
b. Standard: ASTM C 1173.
c. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
d. Sleeve Materials:
1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
2) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
3) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
4. Shielded, Nonpressure Transition Couplings:
a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1) Cascade Waterworks Mfg. Co.
2) Mission Rubber Company; a division of MCP Industries, Inc.
b. Standard: ASTM C 1460.
c. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

PART 3 - EXECUTION

3.1 EARTH MOVING

A. Comply with requirements for excavating, trenching, and backfilling specified in Division 31 Section "Earth Moving."

3.2 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction

loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping at indicated slopes.

F. Install piping free of sags and bends.

G. Install fittings for changes in direction and branch connections.

H. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."

I. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

J. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

K. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
   1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 2 percent downward in direction of flow for piping NPS 4 and larger.
   2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
   3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

L. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

M. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."

N. Install aboveground ABS piping according to ASTM D 2661.

O. Install aboveground PVC piping according to ASTM D 2665.

P. Install underground ABS and PVC piping according to ASTM D 2321.

Q. Plumbing Specialties:
   1. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping. Comply with requirements for cleanouts specified in Division 22 Section "Sanitary Waste Piping Specialties."
   2. Install drains in sanitary drainage gravity-flow piping. Comply with requirements for drains specified in Division 22 Section "Sanitary Waste Piping Specialties."

R. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

S. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."

T. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."

U. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 22 Section "Escutcheons for Plumbing Piping."

3.3 JOINT CONSTRUCTION

A. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.

B. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.

C. Join copper tube and fittings with soldered joints according to ASTM B 828. Use ASTM B 813, water-flushable, lead-free flux and ASTM B 32, lead-free-alloy solder.

D. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.

E. Plastic, Nonpressure-Piping, Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
3. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 Appendixes.

3.4 SPECIALTY PIPE FITTING INSTALLATION

A. Transition Couplings:

1. Install transition couplings at joints of piping with small differences in OD's.
2. In Drainage Piping: Unshielded or Shielded, nonpressure transition couplings.

3.5 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for seismic-restraint devices specified in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."

B. Comply with requirements for pipe hanger and support devices and installation specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."

1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
2. Install stainless-steel pipe hangers for horizontal piping in corrosive environments.
3. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
4. Install stainless-steel pipe support clamps for vertical piping in corrosive environments.
5. Vertical Piping: MSS Type 8 or Type 42, clamps.
6. Install individual, straight, horizontal piping runs:
   a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
   b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
   c. Longer Than 100 Feet if Indicated on drawings: MSS Type 49, spring cushion rolls.
7. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
8. Base of Vertical Piping: MSS Type 52, spring hangers.

C. Support horizontal piping and tubing within 12 inches of each fitting, valve, and coupling.

D. Support vertical piping and tubing at base and at each floor.

E. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.

F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
2. NPS 3: 60 inches with 1/2-inch rod.
3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
4. NPS 6 and NPS 8: 60 inches with 3/4-inch rod.
5. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.

G. Install supports for vertical cast-iron soil piping every 15 feet.

H. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4: 72 inches with 3/8-inch rod.
2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
3. NPS 2-1/2: 108 inches with 1/2-inch rod.
4. NPS 3 and NPS 5: 10 feet with 1/2-inch rod.

5. NPS 6: 10 feet with 5/8-inch rod.
6. NPS 8: 10 feet with 3/4-inch rod.

I. Install supports for vertical copper tubing every 10 feet.

J. Install hangers for ABS and PVC piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS : 48 inches with 3/8-inch rod.
2. NPS 3: 48 inches with 1/2-inch rod.
3. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
4. NPS 6 and NPS 8: 48 inches with 3/4-inch rod.

K. Install supports for vertical ABS and PVC piping every 48 inches.

L. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.6 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.

C. Connect drainage and vent piping to the following:
1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
5. Equipment: Connect drainage piping as indicated. Provide shutoff valve if indicated and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.

D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

E. Make connections according to the following unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.7 IDENTIFICATION

A. Identify exposed sanitary waste and vent piping. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.8 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.

3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.9 CLEANING AND PROTECTION

A. Clean interior of piping. Remove dirt and debris as work progresses.
B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.10 PIPING SCHEDULE

A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
B. Aboveground, soil and waste piping NPS 4 and smaller shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; CISPI or heavy-duty hubless-piping couplings; and coupled joints.
3. Copper DWV tube, copper drainage fittings, and soldered joints.
4. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.
C. Aboveground, soil and waste piping NPS 5 and larger shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; CISPI heavy-duty hubless-piping couplings; and coupled joints.
3. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.
D. Aboveground, vent piping NPS 4 and smaller shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; CISPI or heavy-duty hubless-piping couplings; and coupled joints.
3. Copper DWV tube, copper drainage fittings, and soldered joints.
4. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.
E. Aboveground, vent piping NPS 5 and larger shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; CISPI or heavy-duty hubless-piping couplings; and coupled joints.
3. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.
F. Underground, soil, waste, and vent piping NPS 4 and smaller shall be any of the following:
1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; CISPI or heavy-duty or cast-iron hubless-piping couplings; and coupled joints.
3. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.
G. Underground, soil and waste piping NPS 5 and larger shall be any of the following:
1. Service class, cast-iron soil piping; gaskets; and gasketed joints.

2. Hubless, cast-iron soil pipe and fittings; CISPI or heavy-duty or cast-iron hubless-piping couplings; coupled joints.
3. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.

H. Underground outside of building, soil, waste, and vent piping NPS 4 and smaller shall be any of the following:
1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; CISPI or heavy-duty or cast-iron hubless-piping couplings; and coupled joints.
3. Solid wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
4. Solid wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
5. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.

I. Underground outside of building, soil and waste piping NPS 5 and larger shall be any of the following:
1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; CISPI or heavy-duty or cast-iron hubless-piping couplings; coupled joints.
3. Solid-wall PVC pipe; PVC socket fittings; and solvent-cemented joints.
4. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.

END OF SECTION 22 13 16

Section 22 13 19
SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following sanitary drainage piping specialties:
   1. Cleanouts.
   2. Floor drains.
   3. Roof flashing assemblies.
   4. Miscellaneous sanitary drainage piping specialties.
   5. Flashing materials.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and accessories for grease interceptors.

1.3 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Exposed Cast-Iron Cleanouts:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Josam Company; Josam Div.
      b. MIFAB, Inc.
      c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
      d. Tyler Pipe; Wade Div.
      e. Watts Drainage Products Inc.
      f. Zurn Plumbing Products Group; Specification Drainage Operation.
   2. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
   3. Size: Same as connected drainage piping
   4. Body Material: Hub-and-spigot, cast-iron soil pipe T-branch of Hubless, cast-iron soil pipe test tee as required to match connected piping.
   5. Closure: Countersunk or raised-head, brass or cast-iron plug.
   6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

B. Cast-Iron Floor Cleanouts:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Josam Company; Josam Div.
      b. Sioux Chief Manufacturing Company, Inc.
      c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
      d. Tyler Pipe; Wade Div.
      e. Watts Drainage Products Inc.
      f. Zurn Plumbing Products Group.
   2. Standard: ASME A112.36.2M for threaded, adjustable housing cleanout.
   3. Size: Same as connected branch.
   4. Type: Adjustable housing.
   5. Body or Ferrule: Cast iron.
   6. Clamping Device: Required, coordinate with model specified in fixture schedule.
   7. Outlet Connection: coordinate with model specified in fixture schedule.
   8. Closure: Brass plug with straight threads and gasket or Brass plug with tapered threads.
   9. Adjustable Housing Material: Cast iron with threads.
   10. Frame and Cover Material and Finish: Nickel-bronze, copper alloy or Polished bronze or Rough bronze.
   11. Frame and Cover Shape: Round as standard or Square for tile floor application.
   12. Top Loading Classification: Heavy or Medium Duty.

13. Riser: ASTM A 74, Extra-Heavy or Service class, cast-iron drainage pipe fitting and riser to cleanout.

C. Cast-Iron Wall Cleanouts:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Josam Company; Josam Div.
b. MIFAB, Inc.
c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
d. Tyler Pipe; Wade Div.
e. Watts Drainage Products Inc.
f. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hub-and-spigot, cast-iron soil pipe T-branch or Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: Countersunk or raised-head, drilled-and-threaded brass or cast-iron plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Wall Access: Round, flat, chrome-plated brass or stainless-steel cover plate with screw.
8. Wall Access: Round stainless-steel wall-installation frame and cover.

2.2 FLOOR DRAINS

A. Cast-Iron Floor Drains:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Josam Company; Josam Div.
b. MIFAB, Inc.
c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
d. Tyler Pipe; Wade Div.
e. Watts Drainage Products Inc.
f. Zurn Plumbing Products Group.
2. Standard: ASME A112.6.3.
3. Pattern: Floor drain.
4. Body Material: Gray iron.
5. Seepage Flange: Required.
6. Anchor Flange: Required.
7. Clamping Device: Required.
8. Outlet: Bottom.
9. Backwater Valve: Not required.
10. Coating on Interior and Exposed Exterior Surfaces: Acid-resistant enamel.
11. Sediment Bucket: Required for floor sinks.
12. Top or Strainer Material: Nickel bronze or Polished bronze for floor drain and acid-resistant enamel coated steel for floor sink.
13. Top of Body and Strainer Finish: Nickel bronze or Polished bronze for floor drain and acid-resistant enamel coated steel for floor sink.
14. Top Shape: Round or Square for floor drain and square for floor sink.
15. Dimensions of Top or Strainer: See drawings for fixture schedule, full of half grate for floor sink.
16. Top Loading Classification: Heavy Duty or Medium Duty.
17. Funnel: Not required.
18. Inlet Fitting: Gray iron, with threaded inlet (see fixture schedule) and threaded or spigot outlet, and trap-seal primer valve connection.
19. Trap Material: Cast iron.
20. Trap Pattern: Deep-seal P-trap in mechanical spaces, otherwise Standard P-trap.
21. Trap Features: Trap-seal primer valve drain connection.

2.3 ROOF FLASHING ASSEMBLIES

A. Roof Flashing Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Acorn Engineering Company; Elmdor/Stoneman Div.
   b. Thaler Metal Industries Ltd.

B. Description: Manufactured assembly made of 6.0-lb/sq. ft., 0.0938-inch- thick, lead flashing collar and skirt extending at least 8 inches from pipe, with galvanized-steel boot reinforcement and counterflashing fitting.
1. Open-Top Vent Cap: Without cap.
2. Low-Silhouette Vent Cap: With vandal-proof vent cap.
3. Extended Vent Cap: With field-installed, vandal-proof vent cap.

2.4 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Open Drains:
1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron, soil-pipe fittings. Include P-trap, hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564, rubber gaskets.
2. Size: Same as connected waste piping with increaser fitting of size indicated.

B. Deep-Seal Traps:
1. Description: Cast-iron or bronze casting, with inlet and outlet matching connected piping and cleanout trap-seal primer valve connection.
2. Size: Same as connected waste piping.
   a. NPS 2: 4-inch- minimum water seal.
   b. NPS 2-1/2 and Larger: 5-inch- minimum water seal.

C. Floor-Drain, Trap-Seal Primer Fittings:
1. Description: Cast iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
2. Size: Same as floor drain outlet with NPS 1/2 side inlet.

D. Air-Gap Fittings:
1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Body: Bronze or cast iron.
3. Inlet: Opening in top of body.
4. Outlet: Larger than inlet.
5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

E. Sleeve Flashing Device:
1. Description: Manufactured, cast-iron fitting, with clamping device, that forms sleeve for pipe floor penetrations of floor membrane. Include galvanized-steel pipe extension in top of fitting that will extend 2 inches above finished floor and galvanized-steel pipe extension in bottom of fitting that will extend through floor slab.
2. Size: As required for close fit to riser or stack piping.

F. Stack Flashing Fittings :
1. Description: Counterflashing-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.
2. Size: Same as connected stack vent or vent stack.

G. Vent Caps:
1. Description: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and setscrews to secure to vent pipe.
2. Size: Same as connected stack vent or vent stack.

2.5 FLASHING MATERIALS

A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:
1. General Use: 4.0-lb/sq. ft, 0.0625-inch thickness.
2. Vent Pipe Flashing: 3.0-lb/sq. ft., 0.0469-inch thickness.
3. Burning: 6-lb/sq. ft., 0.0938-inch thickness.

B. Fasteners: Metal compatible with material and substrate being fastened.

C. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.
D. Solder: ASTM B 32, lead-free alloy.
E. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
   1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
   2. Locate at each change in direction of piping greater than 45 degrees.
   3. Locate at minimum intervals of 100 feet for piping unless shown at closer intervals on drawings, see drawings.
   4. Locate at base of each vertical soil and waste stack.
B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
D. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
   1. Position floor drains for easy access and maintenance.
   2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
      a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression, coordinate with architectural plans for floor slopes.
      b. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression, coordinate with architectural plans for floor slopes.
   3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
   4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
E. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.
F. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.
G. Assemble open drain fittings and install with top of hub 2 inches above floor.
H. Install deep-seal traps on floor drains and other waste outlets, if indicated. Deep seal traps required in mechanical rooms.
I. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
   1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
   2. Size: Same as floor drain inlet.
J. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.
K. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.
L. Install vent caps on each vent pipe passing through roof.
M. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
B. Install piping adjacent to equipment to allow service and maintenance.

3.3 FLASHING INSTALLATION

A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:

1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft, 0.0938-inch thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft., 0.0625-inch thickness or thinner.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
   1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
   2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
   3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

C. Set flashing on floors and roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Division 07 Section "Sheet Metal Flashing and Trim."

F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess if not covered in Division 7 Section.

3.4 LABELING AND IDENTIFYING

A. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.5 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221319

Section 22 15 13
GENERAL-SERVICE COMPRESSED-AIR PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes piping and related specialties for general-service compressed-air systems operating at 200 psig or less.

1.3 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic. PIPING NOT USED
B. CR: Chlorosulfonated polyethylene synthetic rubber.
C. EPDM: Ethylene-propylene-diene terpolymer rubber.
D. HDPE: High-density polyethylene plastic. PIPING NOT USED
E. NBR: Acrylonitrile-butadiene rubber.
F. PE: Polyethylene plastic. PIPING NOT USED
G. PVC: Polyvinyl chloride plastic. PIPING NOT USED
H. High-Pressure Compressed-Air Piping: System of compressed-air piping and specialties operating at pressures between 150 and 200 psig.
I. Low-Pressure Compressed-Air Piping: System of compressed-air piping and specialties operating at pressures of 150 psig or less.

1.4 PERFORMANCE REQUIREMENTS

A. Seismic Performance: None

1.5 SUBMITTALS

A. Product Data: For the following:
   1. Pipes, fittings, and valves.
   2. Dielectric fittings.
   3. Flexible pipe connectors.
   4. Safety valves.
   5. Pressure regulators. Include rated capacities and operating characteristics.
   6. Automatic drain valves.
   7. Filters. Include rated capacities and operating characteristics.
   8. Lubricators. Include rated capacities and operating characteristics.
   9. Quick couplings.
   10. Hose assemblies.
B. Brazing and welding certificates.
C. Qualification Data: For Installers.
D. Field quality-control test reports.
E. Operation and Maintenance Data: For general-service compressed-air piping specialties to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Extruded-Tee Outlet Procedure: Qualify operators according to training provided by T-DRILL Industries Inc., for making branch outlets.
   2. Pressure-Seal Joining Procedure for Copper Tubing: Qualify operators according to training provided by Viega; Plumbing and Heating Systems.
   3. Pressure-Seal Joining Procedure for Steel Piping. Qualify operators according to training provided by Victaulic Company.
B. Brazing: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications," or to AWS B2.2, "Standard for Brazing Procedure and Performance Qualification."
C. Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
D. ASME Compliance:
   1. Comply with ASME B31.1, "Power Piping," for high-pressure compressed-air piping.

2. Comply with ASME B31.9, "Building Services Piping," for low-pressure compressed-air piping.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. Schedule 40, Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B, black or hot-dip zinc coated with ends threaded according to ASME B1.20.1.
   1. Steel Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106, Schedule 40, galvanized seamless steel pipe. Include ends matching joining method.
   2. Malleable-Iron Fittings: ASME B16.3, Class 150 or 300, threaded.
   3. Malleable-Iron Unions: ASME B16.39, Class 150 or 300, threaded.
   4. Steel Flanges: ASME B16.5, Class 150 or 300, carbon steel, threaded.
   5. Wrought-Steel Butt-Welding Fittings: ASME B16.9, Schedule 40.
   6. Steel Flanges: ASME B16.5, Class 150 or 300, carbon steel.
   7. Grooved-End Fittings and Couplings:
      a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
         1) Anvil International, Inc.
         2) Star Pipe Products; Star Fittings Div.
         3) Victaulic Company.
         4) Ward Manufacturing, Inc.
      b. Grooved-End Fittings: ASTM A 47/A 47M, malleable-iron castings or ASTM A 536, ductile-iron casting; with grooves according to AWWA C606 and dimensions matching steel pipe.
      c. Couplings: AWWA C606 or UL 213, for steel-pipe dimensions and rated for 300-psig (2070-kPa) minimum working pressure. Include ferrous housing sections, gasket suitable for compressed air, and bolts and nuts. Provide EDPM gaskets for oil-free compressed air. Provide NBR gaskets if compressed air contains oil or oil vapor.

B. Copper Tube: ASTM B 88, Type K or L (ASTM B 88M, Type A or B) seamless, drawn-temper, water tube.
   1. Wrought-Copper Fittings: ASME B16.22, solder-joint pressure type or MSS SP-73, wrought copper with dimensions for brazed joints.
   2. Cast-Copper-Alloy Flanges: ASME B16.24, Class 150 or 300.
   3. Copper Unions: ASME B16.22 or MSS SP-123.
   4. Grooved-End Fittings and Couplings:
      a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
         1) Anvil International, Inc.
         2) Victaulic Company.
      b. Grooved-End Fittings: ASTM B 75 (ASTM B 75M), copper tube or ASTM B 584, bronze castings.
      c. Couplings: Copper-tube dimensions and design similar to AWWA C606. Include ferrous housing sections, gasket suitable for compressed air, and bolts and nuts. Provide EDPM gasket for oil-free compressed air. Provide NBR gasket if compressed air contains oil or oil vapor.

C. Transition Couplings for Metal Piping: Metal coupling or other manufactured fitting same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

2.2 JOINING MATERIALS

A. Pipe-Flange Gasket Materials: Suitable for compressed-air piping system contents.
   1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.
      a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
      b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
D. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated.
E. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.3 VALVES

A. Metal Ball, Butterfly, Check, Gate, and Globe Valves: Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping."

2.4 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
B. Dielectric Unions:
    1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        a. Capitol Manufacturing Company.
        b. Central Plastics Company.
        c. Hart Industries International, Inc.
        d. Jomar International Ltd.
        e. Matco-Norca, Inc.
        f. McDonald, A. Y. Mfg. Co.
        g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
        h. Wilkins; a Zurn company.
    2. Description:
        a. Standard: ASSE 1079.
        b. Pressure Rating: 250 psig (1725 kPa).
        c. End Connections: Solder-joint copper alloy and threaded ferrous.
C. Dielectric Flanges:
    1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        a. Capitol Manufacturing Company.
        b. Central Plastics Company.
        c. Matco-Norca, Inc.
        d. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
        e. Wilkins; a Zurn company.
    2. Description:
        a. Standard: ASSE 1079.
        b. Factory-fabricated, bolted, companion-flange assembly.
        c. Pressure Rating: 300 psig (2070 kPa).
        d. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
D. Dielectric-Flange Insulating Kits:
    1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        a. Advance Products & Systems, Inc.
        b. Calpico, Inc.
        c. Central Plastics Company.
        d. Pipeline Seal and Insulator, Inc.
    2. Description:
        a. Nonconducting materials for field assembly of companion flanges.
        b. Pressure Rating: 150 psig (1035 kPa).
        c. Gasket: Neoprene or phenolic.

d. Bolt Sleeves: Phenolic or polyethylene.
e. Washers: Phenolic with steel backing washers.

2.5 FLEXIBLE PIPE CONNECTORS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Flex-Hose Co., Inc.
2. Flexicraft Industries.
3. Hyspan Precision Products, Inc.
4. Mercer Rubber Co.
5. Metraflex, Inc.
6. Proco Products, Inc.
7. Unaflex, Inc.
8. Universal Metal Hose; a Hyspan Company

C. Bronze-Hose Flexible Pipe Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.
1. Working-Pressure Rating: 250 psig (1725 kPa) minimum.
2. End Connections, NPS 2 (DN 50) and Smaller: Threaded copper pipe or plain-end copper tube.
3. End Connections, NPS 2-1/2 (DN 65) and Larger: Flanged copper alloy.

D. Stainless-Steel-Hose Flexible Pipe Connectors: Corrugated-stainless-steel tubing with stainless-steel wire-braid covering and ends welded to inner tubing.
1. Working-Pressure Rating: 250 psig (1725 kPa) minimum.
2. End Connections, NPS 2 (DN 50) and Smaller: Threaded steel pipe nipple.
3. End Connections, NPS 2-1/2 (DN 65) and Larger: Flanged steel nipple.

2.6 SPECIALTIES

A. Safety Valves: ASME Boiler and Pressure Vessel Code: Section VIII, "Pressure Vessels," construction; National Board certified, labeled, and factory sealed; constructed of bronze body with poppet-type safety valve for compressed-air service.
1. Pressure Settings: Higher than discharge pressure and same or lower than receiver pressure rating.

B. Air-Main Pressure Regulators: Bronze body, direct acting, spring-loaded manual pressure-setting adjustment, and rated for 250-psig (1725-kPa) inlet pressure, unless otherwise indicated.
1. Type: Pilot operated.

C. Air-Line Pressure Regulators: Diaphragm or pilot operated, bronze body, direct acting, spring-loaded manual pressure-setting adjustment, and rated for 200-psig (1380-kPa) minimum inlet pressure, unless otherwise indicated.

D. Air-Line Pressure Regulators: Diaphragm operated, aluminum alloy or plastic body, direct acting, spring-loaded manual pressure-setting adjustment, and rated for 200-psig (1380-kPa) minimum inlet pressure, unless otherwise indicated.

E. Automatic Drain Valves: Stainless-steel body and internal parts, rated for 200-psig (1380-kPa) minimum working pressure, capable of automatic discharge of collected condensate. Include mounting bracket if wall mounting is indicated.

F. Coalescing Filters: Coalescing type with activated carbon capable of removing water and oil aerosols; with color-change dye to indicate when carbon is saturated and warning light to indicate when selected maximum pressure drop has been exceeded. Include mounting bracket if wall mounting is indicated.

G. Mechanical Filters: Two-stage, mechanical-separation-type, air-line filters. Equip with deflector plates, resin-impregnated-ribbon-type filters with edge filtration, and drain cock. Include mounting bracket if wall mounting is indicated.

H. Air-Line Lubricators: With drip chamber and sight dome for observing oil drop entering air stream; with oil-feed adjustment screw and quick-release collar for easy bowl removal. Include mounting bracket if wall mounting is indicated.
1. Provide with automatic feed device for supplying oil to lubricator.

2.7 QUICK COUPLINGS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Aeroquip Corporation; Eaton Corp.
   2. Bowes Manufacturing Inc.
   3. Foster Manufacturing, Inc.
   4. Milton Industries, Inc.
   5. Parker Hannifin Corp.; Fluid Connectors Group; Quick Coupling Div.
   6. Rectus Corp.
   7. Schrader-Bridgeport; Amflo Div.
   8. Schrader-Bridgeport/Standard Thomson.
   9. Snap-Tite, Inc.; Quick Disconnect & Valve Division.
   10. TOMCO Products Inc.
   11. Tuthill Corporation; Hansen Coupling Div.

B. General Requirements for Quick Couplings: Assembly with locking-mechanism feature for quick connection and disconnection of compressed-air hose.

C. Automatic-Shutoff Quick Couplings: Straight-through brass body with O-ring or gasket seal and stainless-steel or nickel-plated-steel operating parts.
   1. Socket End: With one-way valve and threaded inlet for connection to piping or threaded hose fitting.
   2. Plug End: Flow-sensor-bleeder, check-valve type with barbed outlet for attaching hose.

D. Valveless Quick Couplings: Straight-through brass body with stainless-steel or nickel-plated-steel operating parts.
   1. Socket End: With O-ring or gasket seal, without valve, and with barbed inlet for attaching hose.
   2. Plug End: With barbed outlet for attaching hose.

2.8 HOSE ASSEMBLIES

A. Description: Compatible hose, clamps, couplings, and splicers suitable for compressed-air service, of nominal diameter indicated, and rated for 300-psig (2070-kPa) minimum working pressure, unless otherwise indicated.
   1. Hose: Reinforced double-wire-braid, CR-covered hose for compressed-air service.
   2. Hose Clamps: Stainless-steel clamps or bands.
   3. Hose Couplings: Two-piece, straight-through, threaded brass or stainless-steel O-ring or gasket-seal swivel coupling with barbed ends for connecting two sections of hose.
   4. Hose Splicers: One-piece, straight-through brass or stainless-steel fitting with barbed ends for connecting two sections of hose.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. High or Low-Pressure Compressed-Air Distribution Piping: Use one of the following piping materials for each size range:
   1. NPS 2 and Smaller: Schedule 40, black or galvanized-steel pipe; threaded, malleable-iron fittings; and threaded joints.
   2. NPS 2 and Smaller: Type K or L, copper tube; wrought-copper fittings; and brazed or soldered joints.
   3. NPS 2-1/2 to NPS 4: Schedule 40, black or galvanized-steel pipe; threaded, malleable-iron fittings; and threaded joints.
   4. NPS 2-1/2 to NPS 4: Schedule 40, black or galvanized-steel pipe; grooved-end fittings; couplings; and grooved joints.
   5. NPS 2-1/2 to NPS 4: Type K or L, copper tube; wrought-copper fittings; and brazed or soldered joints.
   6. NPS 2-1/2 to NPS 4: Type K or L, copper tube; grooved-end copper fittings; couplings; and grooved joints.
   7. NPS 5 and NPS 6: Schedule 40, black or galvanized-steel pipe; threaded, malleable-iron fittings; and threaded joints.

8. NPS 5 and Larger: Schedule 40, black or galvanized-steel pipe; grooved-end fittings; couplings; and grooved joints.
9. NPS 5 to NPS 8: Type K or L, copper tube; grooved-end copper fittings; couplings; and grooved joints.

B. Drain Piping: Use one of the following piping materials:
1. NPS 2 and Smaller: Type M copper tube; wrought-copper fittings; and brazed or soldered joints.

3.2 VALVE APPLICATIONS

A. General-Duty Valves: Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping" for metal general-duty valves. Use metal valves, unless otherwise indicated.
1. Metal General-Duty Valves: Use valve types specified in "Valve Applications" Article in Division 22 Section "General-Duty Valves for Plumbing Piping" according to the following:
a. Low-Pressure Compressed Air: Valve types specified for low-pressure compressed air.
b. High-Pressure Compressed Air: Valve types specified for medium-pressure compressed air.
c. Equipment Isolation NPS 2 and Smaller: Safety-exhaust, copper-alloy ball valve with exhaust vent and pressure rating at least as great as piping system operating pressure.
d. Grooved-end valves may be used with grooved-end piping and grooved joints.

3.3 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of compressed-air piping. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, air-compressor sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
B. Install piping concealed from view and protected from physical contact by building occupants, unless otherwise indicated and except in equipment rooms and service areas.
C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited, unless otherwise indicated.
D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal and to coordinate with other services occupying that space.
E. Install piping adjacent to equipment and machines to allow service and maintenance.
F. Install air and drain piping with 1 percent slope downward in direction of flow.
G. Install nipples, flanges, unions, transition and special fittings, and valves with pressure ratings same as or higher than system pressure rating, unless otherwise indicated.
H. Equipment and Specialty Flanged Connections:
1. Use steel companion flange with gasket for connection to steel pipe.
2. Use cast-copper-alloy companion flange with gasket and brazed[**or soldered**] joint for connection to copper tube. Do not use soldered joints for connection to air compressors or to equipment or machines producing shock or vibration.
I. Flanged joints may be used instead of specified joint for any piping or tubing system.
J. Extended-tee outlets with brazed branch connection may be used for copper tubing, within extruded-tee connection diameter to run tube diameter ratio for tube type, according to Extruded Tee Connections Sizes and Wall Thickness for Copper Tube (Inches) Table in ASTM F 2014.
K. Install eccentric reducers where compressed-air piping is reduced in direction of flow, with bottoms of both pipes and reducer fitting flush.
L. Install branch connections to compressed-air mains from top of main. Provide drain leg and drain trap at end of each main and branch and at low points.
M. Install thermometer and pressure gage on discharge piping from each air compressor and on each receiver. Comply with requirements in Division 22 Section "Meters and Gages for Plumbing Piping."
N. Install piping to permit valve servicing.
O. Install piping free of sags and bends.
P. Install fittings for changes in direction and branch connections.

Q. Install seismic restraints on piping. Seismic-restraint devices are specified in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."
R. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."
S. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."
T. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 22 Section "Escutcheons for Plumbing Piping."

3.4 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
    1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
    2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
D. Welded Joints for Steel Piping: Join according to AWS D10.12/D10.12M.
E. Brazed Joints for Copper Tubing: Join according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter.
F. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Join according to ASTM B 828 or CDA's "Copper Tube Handbook."
G. Flanged Joints: Use asbestos-free, nonmetallic gasket suitable for compressed air. Join flanges with gasket and bolts according to ASME B31.9 for bolting procedure.
H. Grooved Joints: Assemble couplings with housing, gasket, lubricant, and bolts. Join according to AWWA C606 for grooved joints. Do not apply lubricant to prelubricated gaskets.
I. Dissimilar Metal Piping Material Joints: Use dielectric fittings.

3.5 VALVE INSTALLATION

A. General-Duty Valves: Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping."
B. Install shutoff valves and unions or flanged joints at compressed-air piping to air compressors.
C. Install shutoff valve at inlet to each automatic drain valve, filter, lubricator, and pressure regulator.
D. Install check valves to maintain correct direction of compressed-air flow to and from compressed-air piping specialties and equipment.

3.6 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
B. NPS 2 and Smaller: Use dielectric unions.
C. NPS 2-1/2 to NPS 4: Use dielectric flanges.
D. NPS 5 and Larger: Use dielectric flange kits.

3.7 FLEXIBLE PIPE CONNECTOR INSTALLATION

A. Install flexible pipe connectors in discharge piping and in inlet air piping from remote air-inlet filter of each air compressor.
B. Install bronze-hose flexible pipe connectors in copper compressed-air tubing.
C. Install stainless-steel-hose flexible pipe connectors in steel compressed-air piping.

3.8 SPECIALTY INSTALLATION

A. Install safety valves on receivers in quantity and size to relieve at least the capacity of connected air compressors.
B. Install air-main pressure regulators in compressed-air piping at or near air compressors.
C. Install air-line pressure regulators in branch piping to equipment and tools.
D. Install automatic drain valves on aftercoolers, receivers, and dryers. Discharge condensate onto nearest floor drain.

E. Install coalescing filters in compressed-air piping at or near air compressors and upstream from mechanical filters. Mount on wall at locations indicated.
F. Install mechanical filters in compressed-air piping at or near air compressors and downstream from coalescing filters. Mount on wall at locations indicated.
G. Install air-line lubricators in branch piping to machine tools. Mount on wall at locations indicated.
H. Install quick couplings at piping terminals for hose connections.
I. Install hose assemblies at hose connections.

3.9 CONNECTIONS

A. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment and machine.
B. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment and machine.

3.10 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support devices.
B. Vertical Piping: MSS Type 8 or 42, clamps.
C. Individual, Straight, Horizontal Piping Runs:
   1. 100 Feet or Less: MSS Type 1, adjustable, steel clevis hangers.
   2. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
D. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
E. Base of Vertical Piping: MSS Type 52, spring hangers.
F. Support horizontal piping within 12 inches of each fitting and coupling.
G. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.
H. Install hangers for Schedule 40, steel piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1/4 to NPS 1/2: 96 inches with 3/8-inch rod.
   2. NPS 3/4 to NPS 1-1/4: 84 inches with 3/8-inch rod.
   3. NPS 1-1/2: 12 feet with 3/8-inch rod.
   4. NPS 2: 13 feet with 3/8-inch rod.
   5. NPS 2-1/2: 14 feet with 1/2-inch rod.
   6. NPS 3: 15 feet with 1/2-inch rod.
I. Install supports for vertical, Schedule 40, steel piping every 15 feet.
J. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1/4: 60 inches with 3/8-inch rod.
   2. NPS 3/8 and NPS 1/2: 72 inches with 3/8-inch rod.
   3. NPS 3/4: 84 inches with 3/8-inch rod.
   4. NPS 1: 96 inches with 3/8-inch rod.
   5. NPS 1-1/4: 108 inches with 3/8-inch rod.
   6. NPS 1-1/2: 10 feet with 3/8-inch rod.
   7. NPS 2: 11 feet with 3/8-inch rod.
   8. NPS 2-1/2: 13 feet with 1/2-inch rod.
   9. NPS 3: 14 feet with 1/2-inch rod.
K. Install supports for vertical copper tubing every 10 feet.

3.11 LABELING AND IDENTIFICATION

A. Install identifying labels and devices for general-service compressed-air piping, valves, and specialties. Comply with requirements in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.12 FIELD QUALITY CONTROL

A. Perform field tests and inspections.
B. Tests and Inspections:
   1. Piping Leak Tests for Metal Compressed-Air Piping: Test new and modified parts of existing piping. Cap and fill general-service compressed-air piping with oil-free dry air or gaseous nitrogen to pressure of 50 psig above system operating pressure, but not less

than 150 psig. Isolate test source and let stand for four hours to equalize temperature. Refill system, if required, to test pressure; hold for two hours with no drop in pressure.

2. Repair leaks and retest until no leaks exist.
3. Inspect filters and lubricators and pressure regulators for proper operation.

C. Prepare test reports.

END OF SECTION 22 15 13

Division 23 - HEATING, VENTILATING & AIR CONDITIONING

Section 23 05 13
COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.3 COORDINATION

A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
   1. Motor controllers.
   2. Torque, speed, and horsepower requirements of the load.
   3. Ratings and characteristics of supply circuit and required control sequence.
   4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

A. Comply with requirements in this Section except when stricter requirements are specified in HVAC equipment schedules or Sections.
B. Comply with NEMA MG 1 unless otherwise indicated.
C. Comply with IEEE 841 for severe-duty motors.

2.2 MOTOR CHARACTERISTICS

A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

A. Description: NEMA MG 1, Design B, medium induction motor.
B. Efficiency: Energy efficient, as defined in NEMA MG 1.
C. Service Factor: 1.15.
D. Multispeed Motors: Variable torque.
   1. For motors with 2:1 speed ratio, consequent pole, single winding.
   2. For motors with other than 2:1 speed ratio, separate winding for each speed.
E. Multispeed Motors: Separate winding for each speed.
F. Rotor: Random-wound, squirrel cage.
G. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
H. Temperature Rise: Match insulation rating or provide class B temperature rise.
I. Insulation: Class F.
J. Code Letter Designation:
   1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
   2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.
K. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

A. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
   1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
   2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
   3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
   4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

2.5 SINGLE-PHASE MOTORS

A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
   1. Permanent-split capacitor.
   2. Split phase.
   3. Capacitor start, inductor run.
   4. Capacitor start, capacitor run.

B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.

C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.

D. Motors 1/20 HP and Smaller: Shaded-pole type.

E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 23 05 13

Section 23 05 53
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Equipment labels.
   2. Warning signs and labels.
   3. Pipe labels.
   4. Duct labels.
   5. Valve tags.
   6. Warning tags.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For color, letter style, and graphic representation required for each identification material and device.

C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

D. Valve numbering scheme.

E. Valve Schedules: For each piping system to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:
   1. Material and Thickness: Brass, 0.032-inch or Stainless steel, 0.025-inch or Aluminum, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
   2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
   3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   4. Fasteners: Stainless-steel rivets or self-tapping screws.
   5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:
   1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
   2. Letter Color: Black.
   3. Background Color: White.
   4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
   5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
   6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering

for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

7. Fasteners: Stainless-steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's Drawing designation or unique equipment number.

D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Black.

C. Background Color: Red.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover or cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: At least 1-1/2 inches high.

2.4 DUCT LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Black.

C. Background Color: White.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.

2. Lettering Size: At least 1-1/2 inches high.

2.5 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
   1. Tag Material: Brass, 0.032-inch or Stainless steel, 0.025-inch or Aluminum, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
   2. Fasteners: Brass wire-link or beaded chain; or S-hook.

B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
   1. Valve-tag schedule shall be included in operation and maintenance data.

2.6 WARNING TAGS

A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.
   1. Size: Approximately 4 by 7 inches.
   2. Fasteners: Brass grommet and wire.
   3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," “HIGH TEMPERATURE AND PRESSURE” or "DO NOT OPERATE."
   4. Color: Yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.
B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

A. Piping Color-Coding: Painting of piping is specified in Division 09 Section "Interior Painting or High-Performance Coatings."
B. Stenciled Pipe Label for underground pipe utility chase: Stenciled labels may be provided instead of manufactured labels at the utility chase, at Installer's option. Install stenciled pipe labels with painted, color-coded bands or rectangles on each pipe utility chase.
   1. Identification Paint: Use for contrasting background.
   2. Stencil Paint: Use for pipe utility chase marking on top of utility chase.
C. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
   1. Near each valve and control device.
   2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
   3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
   4. At access doors, manholes, and similar access points that permit view of concealed piping.
   5. Near major equipment items and other points of origination and termination.
   6. Spaced at maximum intervals of 30 feet along each run. Reduce intervals to 15 feet in areas of congested piping and equipment.
   7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
D. Pipe Label Color Schedule:
   1. Refrigerant Piping:
      a. Background Color: Blue.
      b. Letter Color: Black.

3.4 DUCT LABEL INSTALLATION

A. Install plastic-laminated duct labels with permanent adhesive on air ducts in the following color codes:
   1. Blue: For cold-air supply ducts.
   2. Yellow: For return ducts.
   3. Green: For exhaust-, outside-air-, relief-, and mixed-air ducts.
   4. ASME A13.1 Colors and Designs: For hazardous material exhaust.

B. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 30 feet in each space where ducts are exposed or concealed by removable ceiling system.

3.5 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
   1. Valve-Tag Size and Shape:
      a. Chilled Water: 1-1/2 inches round or square.
      b. Condenser Water: 1-1/2 inches round or square.
      c. Refrigerant: 1-1/2 inches round or square.
      d. Hot Water: 1-1/2 inches round or square.
      e. Gas: 1-1/2 inches round or square.
      f. Low-Pressure Steam: 1-1/2 inches round or square.
      g. High-Pressure Steam: 1-1/2 inches round or square.
      h. Steam Condensate: 1-1/2 inches, round or square.
   2. Valve-Tag Color:
      a. Refrigerant: Blue.
   3. Letter Color:
      a. Refrigerant: Black.

3.6 WARNING-TAG INSTALLATION

A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 23 05 53

Section 23 05 93
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Balancing Air Systems:
      a. Constant-volume air systems.
   2. Balancing Hydronic Laboratory Piping Systems (coordinate with Owner for Bell Prover and Meter Test Apparatus):
      a. Constant-flow hydronic lab systems for Meter Test Apparatus and Bell Prover, coordinate with Owner for this Owner provided system.

1.2 DEFINITIONS

A. AABC: Associated Air Balance Council.
B. NEBB: National Environmental Balancing Bureau.
C. TAB: Testing, adjusting, and balancing.
D. TABB: Testing, Adjusting, and Balancing Bureau.
E. TAB Specialist: An entity engaged to perform TAB Work.

1.3 SUBMITTALS

A. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.
B. Certified TAB reports.

1.4 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC NEBB or TABB.
   1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC NEBB or TABB.
   2. TAB Technician: Employee of the TAB contractor and who is certified by AABC NEBB or TABB as a TAB technician.
B. Certify TAB field data reports and perform the following:
   1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
   2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.
C. TAB Report Forms: Use standard TAB contractor's forms approved by Architect, Engineer or Owner.
D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.
B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.
C. Examine the approved submittals for HVAC systems and equipment.
D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in "Metal Ducts" – Section 233113 and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.
F. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
H. Examine test reports specified in individual system and equipment Sections.
I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
J. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.
K. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.
L. Examine three-way valves for proper installation for their intended function of diverting or mixing fluid flows.
M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.
N. Examine lab piping system pumps (examine lab pumps and piping provided by Owner for Bell Prover and Meter Test Apparatus) to ensure absence of entrained air in the suction piping.
O. Examine operating safety interlocks and controls on HVAC equipment.
P. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.
B. Complete system-readiness checks and prepare reports. Verify the following:
   1. Permanent electrical-power wiring is complete.
   2. Hydronic lab systems are filled, clean, and free of air.
   3. Automatic temperature-control systems are operational.
   4. Equipment and duct access doors are securely closed.
   5. Balance, smoke, and fire dampers are open.
   6. Isolating and balancing valves are open and control valves are operational.
   7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
   8. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" and ASHRAE 111 and NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.
   1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."
B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
   1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
   2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to "HVAC Piping Insulation – Section 230719 and “Duct Insulation" – Section 230713.
C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
B. Prepare schematic diagrams of systems' "as-built" duct layouts.
C. For variable-air-volume systems, develop a plan to simulate diversity.
D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
E. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.
F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
G. Verify that motor starters are equipped with properly sized thermal protection.
H. Check dampers for proper position to achieve desired airflow path.
I. Check for airflow blockages.
J. Check condensate drains for proper connections and functioning.
K. Check for proper sealing of air-handling-unit components.
L. Verify that air duct system is sealed as specified in "Metal Ducts" – Section 233113.

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
    1. Measure total airflow.
        a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.
    2. Measure fan static pressures as follows to determine actual static pressure:
        a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
        b. Measure static pressure directly at the fan outlet or through the flexible connection.
        c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
        d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.
    3. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.
        a. Report the cleanliness status of filters and the time static pressures are measured.
    4. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.
    5. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
    6. Obtain approval from Architect or Engineer or Owner or Commissioning Authority for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in Division 23 Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
    7. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.
    1. Measure airflow of submain and branch ducts.

a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.

2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
3. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

C. Measure air outlets and inlets without making adjustments.
1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

D. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.
1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.6 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

A. Prepare test reports with pertinent design data, and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against the approved pump flow rate. Correct variations that exceed plus or minus 5 percent.

B. Prepare schematic diagrams of systems' "as-built" piping layouts.

C. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:
1. Open all manual valves for maximum flow.
2. Check liquid level in expansion tank.
3. Check makeup water-station pressure gage for adequate pressure for highest vent.
4. Check flow-control valves for specified sequence of operation, and set at indicated flow.
5. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type unless several terminal valves are kept open.
6. Set system controls so automatic valves are wide open to heat exchangers.
7. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.
8. Check air vents for a forceful liquid flow exiting from vents when manually operated.

3.7 PROCEDURES FOR CONSTANT-FLOW HYDRONIC SYSTEMS

A. Measure water flow at pumps. Use the following procedures except for positive-displacement pumps:
1. Verify impeller size by operating the pump with the discharge valve closed. Read pressure differential across the pump. Convert pressure to head and correct for differences in gage heights. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
a. If impeller sizes must be adjusted to achieve pump performance, obtain approval from Architect or Engineer or Owner or Commissioning Authority.
2. Check system resistance. With all valves open, read pressure differential across the pump and mark pump manufacturer's head-capacity curve. Adjust pump discharge valve until indicated water flow is achieved.
a. Monitor motor performance during procedures and do not operate motors in overload conditions.
3. Verify pump-motor brake horsepower. Calculate the intended brake horsepower for the system based on pump manufacturer's performance data. Compare calculated brake horsepower with nameplate data on the pump motor. Report conditions where actual amperage exceeds motor nameplate amperage.
4. Report flow rates that are not within plus or minus 10 percent of design.

B. Measure flow at all automatic flow control valves to verify that valves are functioning as designed.
C. Measure flow at all pressure-independent characterized control valves, with valves in fully open position, to verify that valves are functioning as designed.
D. Set calibrated balancing valves, if installed, at calculated presettings.
E. Measure flow at all stations and adjust, where necessary, to obtain first balance.
   1. System components that have Cv rating or an accurately cataloged flow-pressure-drop relationship may be used as a flow-indicating device.
F. Measure flow at main balancing station and set main balancing device to achieve flow that is 5 percent greater than indicated flow.
G. Adjust balancing stations to within specified tolerances of indicated flow rate as follows:
   1. Determine the balancing station with the highest percentage over indicated flow.
   2. Adjust each station in turn, beginning with the station with the highest percentage over indicated flow and proceeding to the station with the lowest percentage over indicated flow.
   3. Record settings and mark balancing devices.
H. Measure pump flow rate and make final measurements of pump amperage, voltage, rpm, pump heads, and systems' pressures and temperatures including outdoor-air temperature.
I. Measure the differential-pressure-control-valve settings existing at the conclusion of balancing.
J. Check settings and operation of each safety valve. Record settings.

3.8 PROCEDURES FOR MOTORS

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:
   1. Manufacturer's name, model number, and serial number.
   2. Motor horsepower rating.
   3. Motor rpm.
   4. Efficiency rating.
   5. Nameplate and measured voltage, each phase.
   6. Nameplate and measured amperage, each phase.
   7. Starter thermal-protection-element rating.
B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.

3.9 PROCEDURES FOR CONDENSING UNITS

A. Verify proper rotation of fans.
B. Measure entering- and leaving-air temperatures.
C. Record compressor data.

3.10 PROCEDURES FOR HEAT-TRANSFER COILS

A. Measure, adjust, and record the following data for each water coil:
   1. Entering- and leaving-water temperature.
   2. Water flow rate.
   3. Water pressure drop.
   4. Dry-bulb temperature of entering and leaving air.
   5. Wet-bulb temperature of entering and leaving air for cooling coils.
   6. Airflow.
   7. Air pressure drop.
B. Measure, adjust, and record the following data for each electric heating coil:
   1. Nameplate data.
   2. Airflow.
   3. Entering- and leaving-air temperature at full load.
   4. Voltage and amperage input of each phase at full load and at each incremental stage.
   5. Calculated kilowatt at full load.
   6. Fuse or circuit-breaker rating for overload protection.
C. Measure, adjust, and record the following data for each steam coil:
   1. Dry-bulb temperature of entering and leaving air.

2. Airflow.
3. Air pressure drop.
4. Inlet steam pressure.

D. Measure, adjust, and record the following data for each refrigerant coil:
1. Dry-bulb temperature of entering and leaving air.
2. Wet-bulb temperature of entering and leaving air.
3. Airflow.
4. Air pressure drop.
5. Refrigerant suction pressure and temperature.

3.11 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:
1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 5 percent.
2. Air Outlets and Inlets: Plus or minus 5 percent.
3. Owner provided Lab piping systems Flow Rate: Plus or minus 5 percent.

3.12 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: Prepare monthly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.13 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:
1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:
1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:
a. Indicated versus final performance.
b. Notable characteristics of systems.
c. Description of system operation sequence if it varies from the Contract Documents.

12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer's name, type, size, and fittings.
14. Notes to explain why certain final data in the body of reports vary from indicated values.
15. Test conditions for fans and pump performance forms including the following:
    a. Settings for outdoor-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Face and bypass damper settings at coils.
    e. Fan drive settings including settings and percentage of maximum pitch diameter.
    f. Inlet vane settings for variable-air-volume systems.
    g. Settings for supply-air, static-pressure controller.
    h. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
1. Quantities of outdoor, supply, return, and exhaust airflows.
2. Water and steam flow rates.
3. Duct, outlet, and inlet sizes.
4. Pipe and valve sizes and locations.
5. Terminal units.
6. Balancing stations.
7. Position of balancing devices.

3.14 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 23 05 93

Section 23 07 13
DUCT INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes insulating the following duct services:
   1. Indoor, concealed supply and outdoor air.
   2. Indoor, exposed supply and outdoor air.
   3. Indoor, concealed return located in unconditioned space.
   4. Indoor, exposed return located in unconditioned space.
   5. Indoor, concealed exhaust between isolation damper and penetration of building exterior.
   6. Indoor, exposed exhaust between isolation damper and penetration of building exterior.
   7. Outdoor, concealed supply and return.
   8. Outdoor, exposed supply and return.

B. Related Sections:
   1. Division 23 Section "HVAC Equipment Insulation."
   2. Division 23 Section "HVAC Piping Insulation."

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
   2. Detail insulation application at elbows, fittings, dampers, specialties and flanges for each type of insulation.
   3. Detail application of field-applied jackets.
   4. Detail application at linkages of control devices.

C. Field quality-control reports.

1.3 QUALITY ASSURANCE

A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
   2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in "Duct Insulation Schedule, General," "Indoor Duct and Plenum Insulation Schedule," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. CertainTeed Corp.; SoftTouch Duct Wrap.
      b. Johns Manville; Microlite.
      c. Knauf Insulation; Friendly Feel Duct Wrap.
      d. Owens Corning; SOFTR All-Service Duct Wrap.

F. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied ASJ or with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. CertainTeed Corp.; Commercial Board.
      b. Fibrex Insulations Inc.; FBX.
      c. Johns Manville; 800 Series Spin-Glas.
      d. Knauf Insulation; Insulation Board.
      e. Owens Corning; Fiberglas 700 Series.

2.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.
      b. Eagle Bridges - Marathon Industries; 225.
      c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.
      d. Mon-Eco Industries, Inc.; 22-25.
   2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   3. Use adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

C. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.
      b. Eagle Bridges - Marathon Industries; 225.
      c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-50.
      d. Mon-Eco Industries, Inc.; 22-25.
   2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   3. Use adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

2.3 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
   1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below ambient services.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-80/30-90.
      b. Vimasco Corporation; 749.
   2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
   3. Service Temperature Range: Minus 20 to plus 180 deg F.

4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
5. Color: White.

C. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-10.
b. Eagle Bridges - Marathon Industries; 550.
c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 46-50.
d. Mon-Eco Industries, Inc.; 55-50.
e. Vimasco Corporation; WC-1/WC-5.
2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F.
4. Solids Content: 60 percent by volume and 66 percent by weight.
5. Color: White.

2.4 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:
1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
b. Eagle Bridges - Marathon Industries; 405.
c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 95-44.
d. Mon-Eco Industries, Inc.; 44-05.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.
6. For indoor applications, use sealants that have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Use sealants that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

B. ASJ Flashing Sealants Flashing Sealants:
1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.
6. For indoor applications, use sealants that have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Use sealants that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

2.5 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.

3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.
4. FSP Jacket: Aluminum-foil, fiberglass-reinforced scrim with polyethylene backing; complying with ASTM C 1136, Type II.

2.6 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Polyester Fabric: Approximately 1 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. in., in a Leno weave, for ducts.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Mast-A-Fab.
b. Vimasco Corporation; Elastafab 894.

2.7 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
B. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.
C. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Metal Jacketing Systems.
b. ITW Insulation Systems; Aluminum and Stainless Steel Jacketing.
c. RPR Products, Inc.; Insul-Mate.
2. Sheet and roll stock ready for shop or field sizing.
3. Finish and thickness are indicated in field-applied jacket schedules.
4. Moisture Barrier for Indoor Applications: 1-mil- thick, heat-bonded polyethylene and kraft paper or 2.5-mil- thick polysurlyn.
5. Moisture Barrier for Outdoor Applications with Outdoor Aluminum Jacket: 60-mil- thick, laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a crosslaminated polyethylene film covered with aluminum-foil facing with field applied aluminum jacket over the entire exterior.
a. Products: Subject to compliance with requirements, provide one of the following:
1) Polyguard Products, Inc.; Alumaguard 60.

2.8 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
1. Products: Subject to compliance with requirements, provide one of the following:
a. ABI, Ideal Tape Division; 428 AWF ASJ.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
c. Compac Corporation; 104 and 105.
d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
1. Products: Subject to compliance with requirements, provide one of the following:
a. ABI, Ideal Tape Division; 491 AWF FSK.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
c. Compac Corporation; 110 and 111.
d. Venture Tape; 1525 CW NT, 1528 CW, and 1528 CW/SQ.
2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.

5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

C. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
1. Products: Subject to compliance with requirements, provide one of the following:
a. ABI, Ideal Tape Division; 488 AWF.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0800.
c. Compac Corporation; 120.
d. Venture Tape; 3520 CW.
2. Width: 2 inches.
3. Thickness: 3.7 mils.
4. Adhesion: 100 ounces force/inch in width.
5. Elongation: 5 percent.
6. Tensile Strength: 34 lbf/inch in width.

2.9 SECUREMENTS

A. Aluminum Bands: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 3/4 inch wide with wing seal or closed seal.
1. Products: Subject to compliance with requirements, provide one of the following:
a. ITW Insulation Systems; Gerrard Strapping and Seals.
b. RPR Products, Inc.; Insul-Mate Strapping, Seals, and Springs.

B. Insulation Pins and Hangers:
1. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
a. Products: Subject to compliance with requirements, provide one of the following:
1) AGM Industries, Inc.; Tactoo Perforated Base Insul-Hangers.
2) GEMCO; Perforated Base.
3) Midwest Fasteners, Inc.; Spindle.
b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
c. Spindle: Copper- or zinc-coated, low-carbon steel or Aluminum or Stainless steel, fully annealed, 0.106-inch- diameter shank, length to suit depth of insulation indicated.
d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
2. Nonmetal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate fastened to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
a. Products: Subject to compliance with requirements, provide one of the following:
1) GEMCO; Nylon Hangers.
2) Midwest Fasteners, Inc.; Nylon Insulation Hangers.
b. Baseplate: Perforated, nylon sheet, 0.030 inch thick by 1-1/2 inches in diameter.
c. Spindle: Nylon, 0.106-inch- diameter shank, length to suit depth of insulation indicated, up to 2-1/2 inches.
d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
3. Self-Sticking-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
a. Products: Subject to compliance with requirements, provide one of the following:
1) AGM Industries, Inc.; Tactoo Self-Adhering Insul-Hangers.

2) GEMCO; Peel & Press.
3) Midwest Fasteners, Inc.; Self Stick.

b. Baseplate: Galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.

c. Spindle: Copper- or zinc-coated, low-carbon steel or Aluminum or Stainless steel, fully annealed, 0.106-inch- diameter shank, length to suit depth of insulation indicated.

d. Adhesive-backed base with a peel-off protective cover.

4. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick, galvanized-steel or aluminum or stainless-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

a. Products: Subject to compliance with requirements, provide one of the following:
1) AGM Industries, Inc.; RC-150.
2) GEMCO; R-150.
3) Midwest Fasteners, Inc.; WA-150.
4) Nelson Stud Welding; Speed Clips.

b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.

5. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1) GEMCO.
2) Midwest Fasteners, Inc.

C. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

D. Wire: 0.080-inch nickel-copper alloy or 0.062-inch soft-annealed, stainless steel or 0.062-inch soft-annealed, galvanized steel.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. C & F Wire.

2.10 CORNER ANGLES

A. Aluminum Corner Angles: 0.040 inch thick, minimum 1 by 1 inch, aluminum according to ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Keep insulation materials dry during application and finishing.

G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

H. Install insulation with least number of joints practical.

I. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.

J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

K. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
   a. For below ambient services, apply vapor-barrier mastic over staples.
4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.

L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

O. Field applied metal jackets at ductwork located outdoors shall be waterproof without the existence of depressions that could gather water. Only rigid board type insulation may be installed to provide a firm surface for the application of the metal jacket.
1. The metal jacket joints shall be factory fabricated with locking type joints for a aesthetically pleasing appearance.
2. The joints shall be sealed and water proof to keep the insulation dry.
3. The top surface of the metal jacket on horizontal ductwork shall be sloped to provide for water runoff to the edge of the duct from the top of the field installed metal jacket. Depressions which are found to hold standing water on top of ducts located outdoors will be considered a defective installation and shall be replaced.
4. A vapor barrier shall be provided at the exterior of the insulation immediately below the metal jacket. Repair any damage to the vapor barrier before applying the metal jacket.
5. The insulation and vapor barrier must be inspected by the site inspector and pictures of the installation must be submitted to the architect and engineer for review prior to the installation any of the field applied metal jacket.
6. DO NOT FIELD APPLY METAL JACKET until inspection and submittal review of duct insulation is complete and found to be acceptable.
7. Provide corner angles at outside of insulation at corners of duct insulation for firm, straight and uniform edges of field applied metal jackets.

3.3 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations within roof or equipment curbs.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.

3. Extend jacket of outdoor insulation outside roof flashing at least 4 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation up to wall penetrations for a water tight wall penetration assembly with flashing and counterflashing.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 4 inches.
4. Seal jacket to wall flashing with flashing sealant.

C. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

D. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.
1. Comply with requirements in Division 07 Section "Penetration Firestopping" for firestopping and fire-resistive joint sealers.

E. Insulation Installation at Floor Penetrations:
1. Duct: For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
2. Seal penetrations through fire-rated assemblies. Comply with requirements in Division 07 Section "Penetration Firestopping."

3.4 INSTALLATION OF MINERAL-FIBER INSULATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 75 percent coverage of duct and plenum surfaces. Adhesive may be eliminated on top surface of horizontal rectangular ducts if adhesive manufacturer literature submittal provides written exception that allows for this installation.
2. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
   a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
   b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
   c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
   d. Do not overcompress insulation during installation.
   e. Impale insulation over pins and attach speed washers.
   f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
3. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.

4. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

B. Rigid Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 75 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions. Adhesive may be eliminated on top surface of horizontal rectangular ducts if adhesive manufacturer literature submittal provides written exception that allows for this installation.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
   a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
   b. On duct sides with dimensions larger than 18 inches, space pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
   c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
   d. Do not overcompress insulation during installation.
   e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
   a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
   b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
5. For ducts and plenums located outdoors, install a continuous unbroken vapor barrier at the exterior of the insualtion. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch

o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions. Provide waterproof metal jacket.

a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.

b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.

6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.

7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.5 FIELD-APPLIED JACKET INSTALLATION

A. Where FSK jackets are indicated, install as follows:

1. Draw jacket material smooth and tight.
2. Install lap or joint strips with same material as jacket.
3. Secure jacket to insulation with manufacturer's recommended adhesive.
4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch- wide joint strips at end joints.
5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

B. Where metal jackets are indicated, install with locking type factory fabricated joints (same manufacturer as the jacket) at longitudinal seams and locking type factory fabricated jacket end joints. Seal with sealant locking type factory fabricated longitudinal seams arranged to shed water. Seal locking type factory fabricated end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 18 inches o.c. and at locking type end joints.

3.6 FINISHES

A. Insulation with ASJ or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Division 09 painting Sections.

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

C. Do not field paint aluminum or stainless-steel jackets.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to two locations for each duct system defined in the "Duct Insulation Schedule, General" Article.

C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.8 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:

1. Indoor, concealed supply air located in an indirectly conditioned space such as ceilings or chases.

2. Indoor, concealed supply air located in an unconditioned space such as ceilings, attics, crawlspaces or chases.
3. Indoor, exposed supply air located in an unconditioned space.
4. Indoor, concealed or exposed return located in unconditioned space.
5. Indoor, concealed or exposed outside ventilation air located in conditioned space or indirectly conditioned space.
6. Indoor, concealed exhaust between isolation damper and penetration of building exterior.
7. Indoor, exposed exhaust between isolation damper and penetration of building exterior.
8. Outdoor, concealed supply and return.
9. Outdoor, exposed supply and return.

B. Items Not Insulated:
1. Supply air and return air ducts exposed within the conditioned space.
2. Return air ducts within an indirectly conditioned space.
3. Factory-insulated flexible ducts.
4. Factory-insulated plenums and casings.
5. Flexible connectors.
6. Vibration-control devices.
7. Factory-insulated access panels and doors.

3.9 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Concealed in indirectly conditioned space such as ceilings with insulation at the roof or chases within the insulation barrier, Supply-Air Duct and Plenum Insulation: Mineral-fiber blanket or board, 1-1/2 inches thick and 0.75-lb/cu. ft. nominal density, minimum installed R-Value 4.2 with 25% compression of blanket insulation.

B. Concealed in unconditioned space such as ceilings with insulation at the ceiling, chases, attics, or crawlspaces, Supply-Air and Return Air Duct and Plenum Insulation: Mineral-fiber blanket or board, 3 inches thick and 0.75-lb/cu. ft. nominal density, minimum installed R-Value 8.0 with 25% compression of blanket insulation

C. Concealed, Outside Ventilation-Air Duct and Plenum Insulation within indirectly conditioned space: Mineral-fiber blanket or board, 3 inches thick and 0.75-lb/cu. ft. nominal density, minimum installed R-Value 8.0 with 25% compression of blanket insulation.

D. Exposed, Outside Ventilation-Air Duct and Plenum Insulation within conditioned space, indirectly conditioned space or supply air plenum or return air plenum: Mineral-fiber rigid board insulation, 2 inches thick and 3-lb/cu. ft. nominal density, minimum installed R-Value 8.0 with 25% compression of blanket insulation.

3.10 ABOVEGROUND, OUTDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Insulation materials and thicknesses are identified below. If more than one material is listed for a duct system, selection from materials listed is Contractor's option.

B. Concealed in chase or other building construction, Supply-Air Duct and Plenum Insulation: Mineral-fiber board rigid high density board type insulation, 2 inches thick and minimum 3-lb/cu. ft. nominal density, minimum installed R-Value 8.0 with 25% compression of insulation, apply vapor barrier at exterior of insulation.

C. Concealed in chase or other building construction, Return-Air Duct and Plenum Insulation: Mineral-fiber board rigid high density board type insulation, 2 inches thick and minimum 3-lb/cu. ft. nominal density, minimum installed R-Value 8.0 with 25% compression of insulation, apply vapor barrier at exterior of insulation.

D. Concealed, Outdoor-Air Duct and Plenum Insulation (Within outdoor air handler or plenum with sides exposed to conditioned air or similar application): Mineral-fiber board rigid high density board type insulation, 2 inches thick and minimum 3-lb/cu. ft. nominal density, minimum installed R-Value 8.0 with 25% compression of insulation.

E. Exposed, Supply-Air Duct and Plenum Insulation: Mineral-fiber board rigid high density board type insulation, 2 inches thick and minimum 3-lb/cu. ft. nominal density, minimum installed R-Value 8.0 with 25% compression of insulation, apply vapor barrier at exterior of insulation, apply water proof exterior metal jacket over vapor barrier and insulation, see outdoor field applied jacket schedule.

F. Exposed, Return-Air Duct and Plenum Insulation: Mineral-fiber board rigid high density board type insulation, 2 inches thick and minimum 3-lb/cu. ft. nominal density, minimum installed R-Value 8.0 with 25% compression of insulation, apply vapor barrier at exterior of insulation, apply water proof exterior metal jacket over vapor barrier and insulation, see outdoor field applied jacket schedule.

3.11 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Ducts and Plenums, Concealed in conditioned spaces or indirectly conditioned spaces:
   1. None.

D. Ducts and Plenums, Exposed in conditioned spaces or indirectly conditioned spaces:
   1. None.

E. Supply and Return Ducts and Plenums, Exposed in unconditioned, ventilated attic spaces (Insulted metal ducts only: Provide additional aluminum jacket over factory applied FSK or FSP insulation jacket.

   1. Aluminum, Smooth: 0.016 inch thick jacket.

3.12 OUTDOOR, FIELD-APPLIED METAL JACKET SCHEDULE

A. Install metal jacket over insulation material. For insulation with factory-applied jacket with vapor barrier, install the field-applied metal jacket over the factory-applied jacket. Provide vapor barrier at exterior of insulation covered by the water proof metal jacket. Metal jacket seams shall be waterproof. Metal jacket seams shall be joined by metal locking type continuous joints that match the metal jacket and shall be factory fabricated by the metal jacket supplier.
   1. Provide laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a cross-laminated polyethylene film covered with aluminum-foil facing.
   2. No dips allowed on jacket on top of ductwork that will allow pooling of water. Slope top of jacket to one side to drain water from top of jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Ducts and Plenums, Concealed:

   1. Aluminum, Smooth: 0.016 inch thick jacket.

D. Ducts and Plenums, Exposed, up to 48 Inches in Diameter or with Flat Surfaces up to 72 Inches:
   1. Aluminum, Stucco Embossed with 2-1/2-Inch-Deep Corrugations or 4-by-1-Inch Box Ribs: 0.024 inch thick jacket or 0.032 inch thick jacket.

E. Ducts and Plenums, Exposed, Larger Than 48 Inches in Diameter or with Flat Surfaces Larger Than 72 Inches:
   1. Aluminum, Stucco Embossed with 2-1/2-Inch-Deep Corrugations or 4-by-1-Inch Box Ribs: 0.032 inch thick jacket.

END OF SECTION 23 07 13

Section 23 07 19
HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes insulating the following HVAC piping systems:
   1. Refrigerant suction and hot-gas piping, indoors and outdoors.

B. Related Sections:
   1. Division 23 Section "HVAC Equipment Insulation."
   2. Division 23 Section "Duct Insulation."

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
   2. Detail attachment and covering of heat tracing inside insulation.
   3. Detail insulation application at pipe expansion joints for each type of insulation.
   4. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
   5. Detail removable insulation at piping specialties.
   6. Detail application of field-applied jackets.
   7. Detail application at linkages of control devices.
   8. Detail application of leak detection wire with insulation.

C. Qualification Data: For qualified Installer.

D. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

E. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
   2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Field oordinate sizes and locations of supports, hangers, and insulation shields with installed conditions.

B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

C. Coordinate installation and testing of heat tracing.
D. Coordinate installation and testing of leak detection wire.

1.7 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing or leak detection wire. Insulation application may begin on segments that have satisfactory test results.
B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
F. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
    1. Products: Subject to compliance with requirements, provide the following:
        a. Pittsburgh Corning Corporation; Foamglas.
    2. Block Insulation: ASTM C 552, Type I.
    3. Special-Shaped Insulation: ASTM C 552, Type III.
    4. Board Insulation: ASTM C 552, Type IV.
    5. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
    6. Preformed Pipe Insulation with Factory-Applied ASJ: Comply with ASTM C 552, Type II, Class 2.
    7. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.
G. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
    1. Products: Subject to compliance with requirements, provide one of the following:
        a. Aeroflex USA, Inc.; Aerocel.
        b. Armacell LLC; AP Armaflex.
        c. K-Flex USA; Insul-Lock, Insul-Tube, and K-FLEX LS.

2.2 INSULATING CEMENTS

A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.
    1. Products: Subject to compliance with requirements, provide the following:
        a. Ramco Insulation, Inc.; Super-Stik.
B. Expanded or Exfoliated Vermiculite Insulating Cement: Comply with ASTM C 196.
    1. Products: Subject to compliance with requirements, provide the following:
        a. Ramco Insulation, Inc.; Thermokote V.
C. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449.
    1. Products: Subject to compliance with requirements, provide the following:
        a. Ramco Insulation, Inc.; Ramcote 1200 and Quik-Cote.

2.3 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
    1. Chambers," including 2004 Addenda.
B. Cellular-Glass Adhesive: Two-component, thermosetting urethane adhesive containing no flammable solvents, with a service temperature range of minus 100 to plus 200 deg F.
    1. Products: Subject to compliance with requirements, provide the following:

a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 81-84.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3. Use adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

C. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Aeroflex USA, Inc.; Aeroseal.
   b. Armacell LLC; Armaflex 520 Adhesive.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-75.
   d. K-Flex USA; R-373 Contact Adhesive.
2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Use adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

D. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.
   b. Eagle Bridges - Marathon Industries; 225.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-50.
   d. Mon-Eco Industries, Inc.; 22-25.
2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Use adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

2.4 SEALANTS

A. Joint Sealants:

1. Joint Sealants for Cellular-Glass and Polyisocyanurate Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
   b. Eagle Bridges - Marathon Industries; 405.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-45.
   d. Mon-Eco Industries, Inc.; 44-05.
   e. Pittsburgh Corning Corporation; Pittseal 444.
2. Joint Sealants for Polystyrene Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-70.
   b. Eagle Bridges - Marathon Industries; 405.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-45.
   d. Mon-Eco Industries, Inc.; 44-05.
3. Materials shall be compatible with insulation materials, jackets, and substrates.

4. Permanently flexible, elastomeric sealant.
5. Service Temperature Range: Minus 100 to plus 300 deg F.
6. Color: White or gray.
7. For indoor applications, use sealants that have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
8. Use sealants that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

B. FSK and Metal Jacket Flashing Sealants:
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
   b. Eagle Bridges - Marathon Industries; 405.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 95-44.
   d. Mon-Eco Industries, Inc.; 44-05.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.
6. For indoor applications, use sealants that have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Use sealants that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:
1. Products: Subject to compliance with requirements, provide the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.
6. For indoor applications, use sealants that have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Use sealants that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

2.5 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Glass-Fiber Fabric: Approximately 2 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. in. for covering pipe and pipe fittings.
1. Products: Subject to compliance with requirements, provide the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Chil-Glas Number 10.

B. Woven Polyester Fabric: Approximately 1 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. in., in a Leno weave, for pipe.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Mast-A-Fab.
   b. Vimasco Corporation; Elastafab 894.

2.6 FIELD-APPLIED CLOTHS

A. Woven Glass-Fiber Fabric: Comply with MIL-C-20079H, Type I, plain weave, and presized a minimum of 8 oz./sq. yd.

1. Products: Subject to compliance with requirements, provide the following:
   a. Alpha Associates, Inc.; Alpha-Maritex 84215 and 84217/9485RW, Luben 59.

2.7 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.

C. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Johns Manville; Zeston.
      b. P.I.C. Plastics, Inc.; FG Series.
      c. Proto Corporation; LoSmoke.
      d. Speedline Corporation; SmokeSafe.
   2. Adhesive: As recommended by jacket material manufacturer.
   3. Color: White or Color-code jackets based on system..
   4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
      a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

D. Metal Jacket:
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Metal Jacketing Systems.
      b. ITW Insulation Systems; Aluminum and Stainless Steel Jacketing.
      c. RPR Products, Inc.; Insul-Mate.
   2. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
      a. Sheet and roll stock ready for shop or field sizing or Factory cut and rolled to size.
      b. Finish and thickness are indicated in field-applied jacket schedules.
      c. Moisture Barrier for Indoor Applications: 1-mil- thick, heat-bonded polyethylene and kraft paper or 3-mil- thick, heat-bonded polyethylene and kraft paper or 2.5-mil- thick polysurlyn.
      d. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper or 2.5-mil- thick polysurlyn.
      e. Factory-Fabricated Fitting Covers:
         1) Same material, finish, and thickness as jacket.
         2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
         3) Tee covers.
         4) Flange and union covers.
         5) End caps.
         6) Beveled collars.
         7) Valve covers.
         8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

E. Underground Direct-Buried Jacket: 125-mil- thick vapor barrier and waterproofing membrane consisting of a rubberized bituminous resin reinforced with a woven-glass fiber or polyester scrim and laminated aluminum foil.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Pittsburgh Corning Corporation; Pittwrap.
      b. Polyguard Products, Inc.; Insulrap No Torch 125.

2.8 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. ABI, Ideal Tape Division; 428 AWF ASJ.

b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
c. Compac Corporation; 104 and 105.
d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
1. Products: Subject to compliance with requirements, provide one of the following:
a. ABI, Ideal Tape Division; 491 AWF FSK.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
c. Compac Corporation; 110 and 111.
d. Venture Tape; 1525 CW NT, 1528 CW, and 1528 CW/SQ.
2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
1. Products: Subject to compliance with requirements, provide one of the following:
a. ABI, Ideal Tape Division; 370 White PVC tape.
b. Compac Corporation; 130.
c. Venture Tape; 1506 CW NS.
2. Width: 2 inches.
3. Thickness: 6 mils.
4. Adhesion: 64 ounces force/inch in width.
5. Elongation: 500 percent.
6. Tensile Strength: 18 lbf/inch in width.

D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
1. Products: Subject to compliance with requirements, provide one of the following:
a. ABI, Ideal Tape Division; 488 AWF.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0800.
c. Compac Corporation; 120.
d. Venture Tape; 3520 CW.
2. Width: 2 inches.
3. Thickness: 3.7 mils.
4. Adhesion: 100 ounces force/inch in width.
5. Elongation: 5 percent.
6. Tensile Strength: 34 lbf/inch in width.

E. PVDC Tape for Outdoor Applications: White vapor-retarder PVDC tape with acrylic adhesive.
1. Products: Subject to compliance with requirements, provide the following:
a. Dow Chemical Company (The); Saran 560 Vapor Retarder Tape.
2. Width: 3 inches.
3. Film Thickness: 6 mils.
4. Adhesive Thickness: 1.5 mils.
5. Elongation at Break: 145 percent.
6. Tensile Strength: 55 lbf/inch in width.

2.9 SECUREMENTS

A. Bands:
1. Products: Subject to compliance with requirements, provide one of the following:
a. ITW Insulation Systems; Gerrard Strapping and Seals.

b. RPR Products, Inc.; Insul-Mate Strapping, Seals, and Springs.

2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 1/2 inch or 3/4 inch wide with wing seal.
3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 3/4 inch wide with wing seal.

B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

C. Wire: 0.080-inch nickel-copper alloy or 0.062-inch soft-annealed, stainless steel.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. C & F Wire.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

D. Coordinate insulation installation with the trade installing leak detection. Comply with requirements for leak detection that apply to insulation

E. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
1. Install insulation continuously through hangers and around anchor attachments.

2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
   a. For below-ambient services, apply vapor-barrier mastic over staples.
4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above-ambient services, do not install insulation to the following:
1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Manholes.
5. Handholes.
6. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation,

install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.

3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
1. Comply with requirements in Division 07 Section "Penetration Firestopping" for firestopping and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:
1. Pipe: Install insulation continuously through floor penetrations.
2. Seal penetrations through fire-rated assemblies. Comply with requirements in Division 07 Section "Penetration Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.

9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF CELLULAR-GLASS INSULATION

A. Insulation Installation on Straight Pipes and Tubes:
1. Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient services, secure laps with outward-clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:
1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of cellular-glass block insulation of same thickness as pipe insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When preformed sections of insulation are not available, install mitered sections of cellular-glass insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed sections of cellular-glass insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.7 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:
   1. Install pipe insulation to outer diameter of pipe flange.
   2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
   3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
   4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:
   1. Install mitered sections of pipe insulation.
   2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:
   1. Install preformed valve covers manufactured of same material as pipe insulation when available.
   2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
   3. Install insulation to flanges as specified for flange insulation application.
   4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 FIELD-APPLIED JACKET INSTALLATION

A. Where glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.
   1. Draw jacket smooth and tight to surface with 2-inch overlap at seams and joints.
   2. Embed glass cloth between two 0.062-inch- thick coats of lagging adhesive.
   3. Completely encapsulate insulation with coating, leaving no exposed insulation.

B. Where FSK jackets are indicated, install as follows:
   1. Draw jacket material smooth and tight.
   2. Install lap or joint strips with same material as jacket.
   3. Secure jacket to insulation with manufacturer's recommended adhesive.
   4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch- wide joint strips at end joints.
   5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

C. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications. Seal with manufacturer's recommended adhesive.
   1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

D. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

E. Where PVDC jackets are indicated, install as follows:
   1. Apply three separate wraps of filament tape per insulation section to secure pipe insulation to pipe prior to installation of PVDC jacket.
   2. Wrap factory-presized jackets around individual pipe insulation sections with one end overlapping the previously installed sheet. Install presized jacket with an approximate overlap at butt joint of 2 inches over the previous section. Adhere lap seal using adhesive or SSL, and then apply 1-1/4 circumferences of appropriate PVDC tape around overlapped butt joint.

3. Continuous jacket can be spiral-wrapped around a length of pipe insulation. Apply adhesive or PVDC tape at overlapped spiral edge. When electing to use adhesives, refer to manufacturer's written instructions for application of adhesives along this spiral edge to maintain a permanent bond.
4. Jacket can be wrapped in cigarette fashion along length of roll for insulation systems with an outer circumference of 33-1/2 inches or less. The 33-1/2-inch- circumference limit allows for 2-inch- overlap seal. Using the length of roll allows for longer sections of jacket to be installed at one time. Use adhesive on the lap seal. Visually inspect lap seal for "fishmouthing," and use PVDC tape along lap seal to secure joint.
5. Repair holes or tears in PVDC jacket by placing PVDC tape over the hole or tear and wrapping a minimum of 1-1/4 circumferences to avoid damage to tape edges.

3.9 FINISHES

A. Pipe Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Division 09 painting Sections.
1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:
1. Inspect pipe, fittings, strainers, and valves, randomly selected by Prime Consultant, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.11 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
1. Drainage piping located in crawl spaces.
2. Underground piping condenser water piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury such as exposed ADA plumbing fixtures.

3.12 INDOOR PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping:
1. All Pipe Sizes: Insulation shall be one of the following:
a. Cellular Glass: 1-1/2 inches thick.
b. Flexible Elastomeric: 1 inch thick.

3.13 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping:
1. All Pipe Sizes: Insulation shall be one of the following:
a. Cellular Glass: 2 inches thick.
b. Flexible Elastomeric: 2 inches thick.

3.14 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Concealed:

1. Aluminum, Smooth or Stucco Embossed: 0.024 inch thick.

D. Piping, Exposed:

1. Aluminum, Smooth or Stucco Embossed: 0.024 inch thick.

END OF SECTION 23 07 19

Section 23 09 00
INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes control equipment for HVAC systems and components, including control components for terminal heating and cooling units not supplied with factory-wired controls.

1.2 SUBMITTALS

A. Product Data: For each control device indicated.

B. Shop Drawings if central DDC system with remote monitoring is provided:

1. Schematic flow diagrams.
2. Power, signal, and control wiring diagrams.
3. Details of control panel faces.
4. Damper schedule.
5. Valve schedule.
6. DDC System Hardware: Wiring diagrams, schematic floor plans, and schematic control diagrams.
7. Control System Software: Schematic diagrams, written descriptions, and points list.

C. Software and firmware operational documentation.

D. Field quality-control test reports.

E. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer specified or equal.

2.2 CONTROL SYSTEM

A. Manufacturers:

1. Alerton Inc.
2. Johnson Controls, Inc.; Controls Group.
3. Siemens Building Technologies, Inc.
4. Stand-alone equipment manufacturer controls as package systems with specified equipment.

B. Control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, and accessories to control mechanical systems.

C. Control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, accessories, and software connected to distributed controllers operating in multiuser, multitasking environment on token-passing network and programmed to control mechanical systems. An operator workstation permits interface with the network via dynamic color graphics with each mechanical system, building floor plan, and control device depicted by point-and-click graphics.

2.3 DDC EQUIPMENT

A. Operator Workstation: PC-based microcomputer with minimum configuration as follows:

1. Motherboard: With 8 integrated USB 2.0 ports, integrated Intel Pro 10/100 (Ethernet), integrated audio, bios, and hardware monitoring.
2. Processor: AMD Quad core 3.4 MHz.
3. Random-Access Memory: 6 GB.
4. Graphics: Video adapter, minimum 1280 x 1024 pixels, 64-MB video memory, with TV out.

5. Monitor: 19 inches, LCD color.
6. Keyboard: QWERTY, 105 keys in ergonomic shape.
7. USB ports Three minimum.
8. Hard-Disk Drive: 500 GB.
9. CD-ROM Read/Write Drive: high speed.
10. Mouse: Three button, optical.
11. Uninterruptible Power Supply: 2 kVa.
12. Operating System: Windows 7 with high-speed Internet access.

B. Control Units: Modular, comprising processor board with programmable, nonvolatile, random-access memory; local operator access and display panel; integral interface equipment; and backup power source.
   1. Units monitor or control each I/O point; process information; execute commands from other control units, devices, and operator stations; and download from or upload to operator workstation.
   2. Stand-alone mode control functions operate regardless of network status. Functions include the following:
      a. Global communications.
      b. Discrete/digital, analog, and pulse I/O.
      c. Monitoring, controlling, or addressing data points.
      d. Software applications, scheduling, and alarm processing.
      e. Testing and developing control algorithms without disrupting field hardware and controlled environment.

C. Local Control Units: Modular, comprising processor board with electronically programmable, nonvolatile, read-only memory; and backup power source.
   1. Units monitor or control each I/O point, process information, and download from or upload to operator workstation or diagnostic terminal unit.
   2. Stand-alone mode control functions operate regardless of network status. Functions include the following:
      a. Global communications.
      b. Discrete/digital, analog, and pulse I/O.
      c. Monitoring, controlling, or addressing data points.
   3. Local operator interface provides for download from or upload to operator workstation.

D. I/O Interface: Hardwired inputs and outputs may tie into system through controllers. Protect points so that shorting will cause no damage to controllers.
   1. Binary Inputs: Allow monitoring of on-off signals without external power.
   2. Pulse Accumulation Inputs: Accept up to 10 pulses per second.
   3. Analog Inputs: Allow monitoring of low-voltage (0- to 10-V dc), current (4 to 20 mA), or resistance signals.
   4. Binary Outputs: Provide on-off or pulsed low-voltage signal, selectable for normally open or normally closed operation with three-position (on-off-auto) override switches and status lights.
   5. Analog Outputs: Provide modulating signal, either low voltage (0- to 10-V dc) or current (4 to 20 mA) with status lights, two-position (auto-manual) switch, and manually adjustable potentiometer.
   6. Tri-State Outputs: Provide two coordinated binary outputs for control of three-point, floating-type electronic actuators.
   7. Universal I/Os: Provide software selectable binary or analog outputs.

E. Power Supplies: Transformers with Class 2 current-limiting type or overcurrent protection; limit connected loads to 80 percent of rated capacity. DC power supply shall match output current and voltage requirements and be full-wave rectifier type with the following:
   1. Output ripple of 5.0 mV maximum peak to peak.
   2. Combined 1 percent line and load regulation with 100-mic.sec. response time for 50 percent load changes.
   3. Built-in overvoltage and overcurrent protection and be able to withstand 150 percent overload for at least 3 seconds without failure.

F. Power Line Filtering: Internal or external transient voltage and surge suppression for workstations or controllers with the following:
1. Minimum dielectric strength of 1000 V.
2. Maximum response time of 10 nanoseconds.
3. Minimum transverse-mode noise attenuation of 65 dB.
4. Minimum common-mode noise attenuation of 150 dB at 40 to 100 Hz.

2.4 UNITARY CONTROLLERS

A. Unitized, capable of stand-alone operation with sufficient memory to support its operating system, database, and programming requirements, and with sufficient I/O capacity for the application.
1. Configuration: Local keypad and display; diagnostic LEDs for power, communication, and processor; wiring termination to terminal strip or card connected with ribbon cable; memory with bios; and 72-hour battery backup.
2. Operating System: Manage I/O communication to allow distributed controllers to share real and virtual object information and allow central monitoring and alarms. Perform scheduling with real-time clock. Perform automatic system diagnostics; monitor system and report failures.
3. Enclosure: Dustproof rated for operation at 32 to 120 deg F.

2.5 ANALOG CONTROLLERS

A. Step Controllers: 6- or 10-stage type, with heavy-duty switching rated to handle loads and operated by electric motor.

B. Electric, Outdoor-Reset Controllers: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range, adjustable set point, scale range minus 10 to plus 70 deg F, and single- or double-pole contacts.

C. Electronic Controllers: Wheatstone-bridge-amplifier type, in steel enclosure with provision for remote-resistance readjustment. Identify adjustments on controllers, including proportional band and authority.
1. Single controllers can be integral with control motor if provided with accessible control readjustment potentiometer.

D. Fan-Speed Controllers: Solid-state model providing field-adjustable proportional control of motor speed from maximum to minimum of 55 percent and on-off action below minimum fan speed. Controller shall briefly apply full voltage, when motor is started, to rapidly bring motor up to minimum speed. Equip with filtered circuit to eliminate radio interference.

2.6 TIME CLOCKS

A. Manufacturers:

1. Paragon Electric Co., Inc.
2. Precision Multiple Controls, Inc.
3. SSAC Inc.; ABB USA.
4. Time Mark Corporation.

B. Seven-day, programming-switch timer with synchronous-timing motor and seven-day dial; continuously charged, nickel-cadmium-battery-driven, eight-hour, power-failure carryover; multiple-switch trippers; minimum of two and maximum of eight signals per day with two normally open and two normally closed output contacts.

C. Solid-state, programmable time control with 8 separate programs each with up to 100 on-off operations; 1-second resolution; lithium battery backup; keyboard interface and manual override; individual on-off-auto switches for each program; 365-day calendar with 20 programmable holidays; choice of fail-safe operation for each program; system fault alarm; and communications package allowing networking of time controls and programming from PC.

2.7 ELECTRONIC SENSORS

A. Description: Vibration and corrosion resistant; for wall, immersion, or duct mounting as required.

B. Thermistor Temperature Sensors and Transmitters:
1. Available Manufacturers:
a. BEC Controls Corporation.
b. Ebtron, Inc.

c. Heat-Timer Corporation.
d. I.T.M. Instruments Inc.
e. MAMAC Systems, Inc.
f. RDF Corporation.

2. Accuracy: Plus or minus 0.5 deg F at calibration point.
3. Wire: Twisted, shielded-pair cable.
4. Insertion Elements in Ducts: Single point, 8 inches long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft.
5. Averaging Elements in Ducts: 72 inches long, flexible; use where prone to temperature stratification or where ducts are larger than 10 sq. ft.
6. Insertion Elements for Liquids: Brass or stainless-steel socket with minimum insertion length of 2-1/2 inches.
7. Room Sensor Cover Construction: Manufacturer's standard locking covers.
   a. Set-Point Adjustment: Concealed or Exposed.
   b. Set-Point Indication: Concealed or Keyed or Exposed.
   c. Thermometer: Concealed or Exposed.
   d. Color: White.
   e. Orientation: Vertical or Horizontal.
8. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
9. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

C. RTDs and Transmitters:
1. Available Manufacturers:
   a. BEC Controls Corporation.
   b. MAMAC Systems, Inc.
   c. RDF Corporation.
2. Accuracy: Plus or minus 0.2 percent at calibration point.
3. Wire: Twisted, shielded-pair cable.
4. Insertion Elements in Ducts: Single point, 8 inches long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft.
5. Averaging Elements in Ducts: 72 inches long, flexible; use where prone to temperature stratification or where ducts are larger than 9 sq. ft.; length as required.
6. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches.
7. Room Sensor Cover Construction: Manufacturer's standard locking covers.
   a. Set-Point Adjustment: Concealed or Exposed.
   b. Set-Point Indication: Concealed or Keyed or Exposed.
   c. Thermometer: Concealed or Exposed.
   d. Color: White.
   e. Orientation: Vertical or Horizontal.
8. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
9. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

D. Humidity Sensors: Bulk polymer sensor element.
1. Available Manufacturers:
   a. BEC Controls Corporation.
   b. General Eastern Instruments.
   c. MAMAC Systems, Inc.
   d. ROTRONIC Instrument Corp.
   e. TCS/Basys Controls.
   f. Vaisala.
2. Accuracy: 2 percent full range with linear output.
3. Room Sensor Range: 20 to 80 percent relative humidity.
4. Room Sensor Cover Construction: Manufacturer's standard locking covers.
   a. Set-Point Adjustment: Concealed or Exposed.
   b. Set-Point Indication: Concealed or Keyed or Exposed.

c. Thermometer: Concealed or Exposed.
d. Color: White.
e. Orientation: Vertical or Horizontal.

5. Duct Sensor: 20 to 80 percent relative humidity range with element guard and mounting plate.
6. Outside-Air Sensor: 20 to 80 percent relative humidity range with mounting enclosure, suitable for operation at outdoor temperatures of 32 to 120 deg F.
7. Duct and Sensors: With element guard and mounting plate, range of 0 to 100 percent relative humidity.

E. Pressure Transmitters/Transducers:
1. Available Manufacturers:
a. BEC Controls Corporation.
b. General Eastern Instruments.
c. MAMAC Systems, Inc.
d. ROTRONIC Instrument Corp.
e. TCS/Basys Controls.
f. Vaisala.
2. Static-Pressure Transmitter: Nondirectional sensor with suitable range for expected input, and temperature compensated.
a. Accuracy: 2 percent of full scale with repeatability of 0.5 percent.
b. Output: 4 to 20 mA.
c. Building Static-Pressure Range: 0- to 0.25-inch wg.
d. Duct Static-Pressure Range: 0- to 5-inch wg.
3. Water Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig operating pressure; linear output 4 to 20 mA.
4. Water Differential-Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig operating pressure and tested to 300-psig; linear output 4 to 20 mA.
5. Differential-Pressure Switch (Air or Water): Snap acting, with pilot-duty rating and with suitable scale range and differential.
6. Pressure Transmitters: Direct acting for gas or liquid service; range suitable for system; linear output 4 to 20 mA.
7. Room Sensor Cover Construction: Manufacturer's standard locking covers.
a. Set-Point Adjustment: Concealed or Exposed.
b. Set-Point Indication: Concealed or Keyed or Exposed.
c. Thermometer: Concealed or Exposed.
d. Color: White.
e. Orientation: Vertical or Horizontal.

F. Room sensor accessories include the following:
1. Insulating Bases: For sensors located on exterior walls.
2. Guards: Locking; heavy-duty, transparent plastic; mounted on separate base
3. Adjusting Key: As required for calibration and cover screws.

2.8 STATUS SENSORS

A. Status Inputs for Fans: Differential-pressure switch with pilot-duty rating and with adjustable range of 0- to 5-inch wg.
B. Status Inputs for Pumps: Differential-pressure switch with pilot-duty rating and with adjustable pressure-differential range of 8 to 60 psig, piped across pump.
C. Status Inputs for Electric Motors: Comply with ISA 50.00.01, current-sensing fixed- or split-core transformers with self-powered transmitter, adjustable and suitable for 175 percent of rated motor current.
D. Voltage Transmitter (100- to 600-V ac): Comply with ISA 50.00.01, single-loop, self-powered transmitter, adjustable, with suitable range and 1 percent full-scale accuracy.
E. Power Monitor: 3-phase type with disconnect/shorting switch assembly, listed voltage and current transformers, with pulse kilowatt hour output and 4- to 20-mA kW output, with maximum 2 percent error at 1.0 power factor and 2.5 percent error at 0.5 power factor.

F. Current Switches: Self-powered, solid-state with adjustable trip current, selected to match current and system output requirements.
G. Electronic Valve/Damper Position Indicator: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.
H. Water-Flow Switches: Bellows-actuated mercury or snap-acting type with pilot-duty rating, stainless-steel or bronze paddle, with appropriate range and differential adjustment, in NEMA 250, Type 1 enclosure.
1. Available Manufacturers:
a. BEC Controls Corporation.
b. I.T.M. Instruments Inc.

2.9 GAS DETECTION EQUIPMENT

A. Available Manufacturers:
1. B. W. Technologies.
2. CEA Instruments, Inc.
3. Ebtron, Inc.
4. Gems Sensors Inc.
5. Honeywell International Inc.; Home & Building Control.
6. INTEC Controls, Inc.
7. I.T.M. Instruments Inc.
8. Sauter Controls Corporation.
9. Sensidyne, Inc.
10. TSI Incorporated.
11. Vaisala.

B. Carbon Monoxide Detectors: Single or multichannel, dual-level detectors using solid-state plug-in sensors with a 3-year minimum life; suitable over a temperature range of 32 to 104 deg F; with 2 factory-calibrated alarm levels at 50 and 100 ppm.
C. Carbon Dioxide Sensor and Transmitter: Single detectors using solid-state infrared sensors; suitable over a temperature range of 23 to 130 deg F and calibrated for 0 to 2 percent, with continuous or averaged reading, 4- to 20-mA output;, for wall mounting.
D. Occupancy Sensor: Passive infrared, with time delay, daylight sensor lockout, sensitivity control, and 180-degree field of view with vertical sensing adjustment; for flush mounting.

2.10 THERMOSTATS

A. Available Manufacturers:
1. Alerton Inc.
2. Honeywell International Inc.; Home & Building Control.
3. Invensys Building Systems.
4. Johnson Controls, Inc.; Controls Group.
5. Siemens Building Technologies, Inc.

B. Electric, solid-state, microcomputer-based room thermostat with remote sensor.
1. Automatic switching from heating to cooling.
2. Preferential rate control to minimize overshoot and deviation from set point.
3. Set up for four separate temperatures per day.
4. Meets California Title 24 Energy requirements.
5. Instant override of set point for continuous or timed period from 1 hour to 31 days.
6. Short-cycle protection.
7. Programming based on weekday, Saturday, and Sunday.
8. Selection features include degree F or degree C display, 12- or 24-hour clock, keyboard disable, remote sensor, and fan on-auto.
9. Battery replacement without program loss.
10. Thermostat display features include the following:
a. Time of day.
b. Actual room temperature.
c. Programmed temperature.
d. Programmed time.
e. Duration of timed override.
f. Day of week.

g. System mode indications include "heating," "off," "fan auto," and "fan on."

C. Low-Voltage, On-Off Thermostats: NEMA DC 3, 24-V, bimetal-operated, mercury-switch type, with adjustable or fixed anticipation heater, concealed set-point adjustment, 55 to 85 deg F set-point range, and 2 deg F maximum differential.

D. Line-Voltage, On-Off Thermostats: Bimetal-actuated, open contact or bellows-actuated, enclosed, snap-switch or equivalent solid-state type, with heat anticipator; listed for electrical rating; with concealed set-point adjustment, 55 to 85 deg F set-point range, and 2 deg F maximum differential.
1. Electric Heating Thermostats: Equip with off position on dial wired to break ungrounded conductors.
2. Selector Switch: Integral, manual on-off-auto.

E. Remote-Bulb Thermostats: On-off or modulating type, liquid filled to compensate for changes in ambient temperature; with copper capillary and bulb, unless otherwise indicated.
1. Bulbs in water lines with separate wells of same material as bulb.
2. Bulbs in air ducts with flanges and shields.
3. Averaging Elements: Copper tubing with either single- or multiple-unit elements, extended to cover full width of duct or unit; adequately supported.
4. Scale settings and differential settings are clearly visible and adjustable from front of instrument.
5. On-Off Thermostat: With precision snap switches and with electrical ratings required by application.
6. Modulating Thermostats: Construct so complete potentiometer coil and wiper assembly is removable for inspection or replacement without disturbing calibration of instrument.

F. Room Thermostat Cover Construction: Manufacturer's standard locking covers.
1. Set-Point Adjustment: Concealed or Exposed.
2. Set-Point Indication: Concealed or Keyed or Exposed.
3. Thermometer: Concealed or Exposed.
4. Color: White.
5. Orientation: Vertical or Horizontal.

G. Room thermostat accessories include the following:
1. Insulating Bases: For thermostats located on exterior walls.
2. Thermostat Guards: Locking; heavy-duty, transparent plastic; mounted on separate base.
3. Adjusting Key: As required for calibration and cover screws.
4. Set-Point Adjustment: 1/2-inch- diameter, adjustment knob.

H. Immersion Thermostat: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range and adjustable set point.

I. Airstream Thermostats: Two-pipe, fully proportional, single-temperature type; with adjustable set point in middle of range, adjustable throttling range, plug-in test fitting or permanent pressure gage, remote bulb, bimetal rod and tube, or averaging element.

J. Electric, Low-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual- or automatic- reset switch that trips if temperature sensed across any 12 inches of bulb length is equal to or below set point.
1. Bulb Length: Minimum 20 feet.
2. Quantity: One thermostat for every 20 sq. ft. of coil surface.

K. Electric, High-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual- or automatic- reset switch that trips if temperature sensed across any 12 inches of bulb length is equal to or above set point.
1. Bulb Length: Minimum 20 feet.
2. Quantity: One thermostat for every 20 sq. ft. of coil surface.

L. Heating/Cooling Valve-Top Thermostats: Proportional acting for proportional flow, with molded-rubber diaphragm, remote-bulb liquid-filled element, direct and reverse acting at minimum shutoff pressure of 25 psig, and cast housing with position indicator and adjusting knob.

2.11 HUMIDISTATS

A. Available Manufacturers:
1. MAMAC Systems, Inc.

2. ROTRONIC Instrument Corp.

B. Duct-Mounting Humidistats: Electric insertion, 2-position type with adjustable, 2 percent throttling range, 20 to 80 percent operating range, and single- or double-pole contacts.

2.12 ACTUATORS

A. Electric Motors: Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.
1. Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."
2. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.
3. Nonspring-Return Motors for Valves Larger Than NPS 2-1/2: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
4. Spring-Return Motors for Valves Larger Than NPS 2-1/2: Size for running and breakaway torque of 150 in. x lbf.
5. Nonspring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
6. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running and breakaway torque of 150 in. x lbf.

B. Electronic Actuators: Direct-coupled type designed for minimum 60,000 full-stroke cycles at rated torque.
1. Available Manufacturers:
a. Belimo Aircontrols (USA), Inc.
b. Honeywell International Inc.; Home & Building Control.
c. Johnson Controls, Inc.; Controls Group.
d. Siemens Building Technologies, Inc.
2. Valves: Size for torque required for valve close off at maximum pump differential pressure.
3. Dampers: Size for running torque calculated as follows:
a. Parallel-Blade Damper with Edge Seals: 7 inch-lb/sq. ft. of damper.
b. Opposed-Blade Damper with Edge Seals: 5 inch-lb/sq. ft. of damper.
c. Parallel-Blade Damper without Edge Seals: 4 inch-lb/sq. ft of damper.
d. Opposed-Blade Damper without Edge Seals: 3 inch-lb/sq. ft. of damper.
e. Dampers with 2- to 3-Inch wg of Pressure Drop or Face Velocities of 1000 to 2500 fpm: Increase running torque by 1.5.
f. Dampers with 3- to 4-Inch wg of Pressure Drop or Face Velocities of 2500 to 3000 fpm: Increase running torque by 2.0.
4. Coupling: V-bolt and V-shaped, toothed cradle.
5. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
6. Fail-Safe Operation: Mechanical, spring-return mechanism. Provide external, manual gear release on nonspring-return actuators.
7. Power Requirements (Two-Position Spring Return): 24-V ac.
8. Power Requirements (Modulating): Maximum 10 VA at 24-V ac or 8 W at 24-V dc.
9. Proportional Signal: 2- to 10-V dc or 4 to 20 mA, and 2- to 10-V dc position feedback signal.
10. Temperature Rating: Minus 22 to plus 122 deg F.
11. Temperature Rating (Smoke Dampers): Minus 22 to plus 250 deg F.
12. Run Time: 12 seconds open, 5 seconds closed.

2.13 CONTROL VALVES

A. Available Manufacturers:
1. Danfoss Inc.; Air Conditioning & Refrigeration Div.
2. Erie Controls.
3. Hayward Industrial Products, Inc.
4. Magnatrol Valve Corporation.
5. Neles-Jamesbury.

6. Parker Hannifin Corporation; Skinner Valve Division.
7. Pneuline Controls.
8. Sauter Controls Corporation.
9. Honeywell International Inc.; Home & Building Control.
10. Johnson Controls, Inc.; Controls Group.
11. Siemens Building Technologies, Inc.

B. Control Valves: Factory fabricated, of type, body material, and pressure class based on maximum pressure and temperature rating of piping system, unless otherwise indicated.

C. Hydronic system globe valves shall have the following characteristics:
1. NPS 2 and Smaller: Class 125 or 250 bronze body, bronze trim, rising stem, renewable composition disc, and screwed ends with backseating capacity repackable under pressure.
2. NPS 2-1/2 and Larger: Class 125 iron body, bronze trim, rising stem, plug-type disc, flanged ends, and renewable seat and disc.
3. Internal Construction: Replaceable plugs and stainless-steel or brass seats.
   a. Single-Seated Valves: Cage trim provides seating and guiding surfaces for plug on top and bottom.
   b. Double-Seated Valves: Balanced plug; cage trim provides seating and guiding surfaces for plugs on top and bottom.
4. Sizing: 4-psig maximum pressure drop at design flow rate or the following:
   a. Two Position: Line size.
   b. Two-Way Modulating: Twice the load pressure drop, but not more than value specified above.
   c. Three-Way Modulating: Twice the load pressure drop, but not more than value specified above.
5. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics.
6. Close-Off (Differential) Pressure Rating: Combination of actuator and trim shall provide minimum close-off pressure rating of 150 percent of total system (pump) head for two-way valves and 100 percent of pressure differential across valve or 100 percent of total system (pump) head.

D. Butterfly Valves: 200-psig, 150-psig maximum pressure differential, ASTM A 126 cast-iron or ASTM A 536 ductile-iron body and bonnet, extended neck, stainless-steel stem, field-replaceable EPDM or Buna N sleeve and stem seals.
1. Body Style: Wafer or Lug or Grooved.
2. Disc Type: Nickel-plated ductile iron or Aluminum bronze or Elastomer-coated ductile iron.
3. Sizing: 2-psig maximum pressure drop at design flow rate.

E. Terminal Unit Control Valves: Bronze body, bronze trim, two or three ports as indicated, replaceable plugs and seats, and union and threaded ends.
1. Rating: Class 125 for service at 125 psig and 250 deg F operating conditions.
2. Sizing: 4-psig maximum pressure drop at design flow rate, to close against pump shutoff head.
3. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics.

F. Self-Contained Control Valves: Bronze body, bronze trim, two or three ports as indicated, replaceable plugs and seats, and union and threaded ends.
1. Rating: Class 125 for service at 125 psig and 250 deg F operating conditions.
2. Thermostatic Operator: Wax or Liquid-filled [integral or remote sensor with integral or remote adjustable dial.

2.14 DAMPERS

A. Available Manufacturers:
1. Air Balance Inc.
2. Ruskin Inc.
3. Vent Products Company, Inc.
4. Dowco Inc.

B. Dampers: AMCA-rated, parallel blade design for two position control and opposed-blade design for modulating control; 0.108-inch- minimum thick, galvanized-steel or 0.125-inch- minimum thick, extruded-aluminum frames with holes for duct mounting; damper blades shall not be less than 0.064-inch- thick galvanized steel with maximum blade width of 8 inches and length of 48 inches.
   1. Secure blades to 1/2-inch- diameter, zinc-plated axles using zinc-plated hardware, with oil-impregnated sintered bronze blade bearings, blade-linkage hardware of zinc-plated steel and brass, ends sealed against spring-stainless-steel blade bearings, and thrust bearings at each end of every blade.
   2. Operating Temperature Range: From minus 40 to plus 200 deg F.
   3. Operating Pressure Range: At least 2 inches of water above the maximum duct or plenum operating pressure developed by the fans at shut-off, consult fan curves.
   4. Edge Seals, Standard Pressure Applications: Closed-cell neoprene.
   5. Edge Seals, Low-Leakage Applications: Use inflatable blade edging or replaceable rubber blade seals and spring-loaded stainless-steel side seals, rated for leakage at less than 10 cfm per sq. ft. of damper area, at differential pressure of 4-inch wg when damper is held by torque of 50 in. times lbf; when tested according to AMCA 500D.

2.15 CONTROL CABLE

A. Electronic and fiber-optic cables for control wiring are specified in Division 27 Section "Communications Horizontal Cabling."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify location of thermostats, humidistats, and other exposed control sensors with Drawings and room details before installation. Install devices 48 inches above the floor.
   1. Install averaging elements in ducts and plenums in crossing or zigzag pattern.

B. Install guards on thermostats in the following locations:
   1. Entrances.
   2. Public areas.
   3. Where indicated.

C. Install automatic dampers according to Division 23 Section "Air Duct Accessories."

D. Install damper motors on outside of duct in warm areas, not in locations exposed to outdoor temperatures.

E. Install labels and nameplates to identify control components according to Division 23 Section "Identification for HVAC Piping and Equipment."

F. Install hydronic instrument wells, valves, and other accessories according to Division 23 Section "Hydronic Piping."

G. Install refrigerant instrument wells, valves, and other accessories according to Division 23 Section "Refrigerant Piping."

H. Install duct volume-control dampers according to Division 23 Sections specifying air ducts.

I. Install electronic and fiber-optic cables according to Division 27 Section "Communications Horizontal Cabling."

3.2 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. Install raceways, boxes, and cabinets according to Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Install building wire and cable according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

C. Install signal and communication cable according to Division 27 Section "Communications Horizontal Cabling."
   1. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.
   2. Install exposed cable in raceway.
   3. Install concealed cable in raceway.
   4. Bundle and harness multiconductor instrument cable in place of single cables where several cables follow a common path.

5. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
6. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
7. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.

D. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.

E. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:
1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
2. Test and adjust controls and safeties.
3. Test calibration of controllers by disconnecting input sensors and stimulating operation with compatible signal generator.
4. Test each point through its full operating range to verify that safety and operating control set points are as required.
5. Test each control loop to verify stable mode of operation and compliance with sequence of operation. Adjust PID actions.
6. Test each system for compliance with sequence of operation.
7. Test software and hardware interlocks.

C. DDC Verification:
1. Verify that instruments are installed before calibration, testing, and loop or leak checks.
2. Check instruments for proper location and accessibility.
3. Check instrument installation for direction of flow, elevation, orientation, insertion depth, and other applicable considerations.
4. Check instrument tubing for proper fittings, slope, material, and support.
5. Check pressure instruments, piping slope, installation of valve manifold, and self-contained pressure regulators.
6. Check temperature instruments and material and length of sensing elements.
7. Check control valves. Verify that they are in correct direction.
8. Check air-operated dampers. Verify that pressure gages are provided and that proper blade alignment, either parallel or opposed, has been provided.
9. Check DDC system as follows:
a. Verify that DDC controller power supply is from emergency power supply, if applicable.
b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
c. Verify that spare I/O capacity has been provided.
d. Verify that DDC controllers are protected from power supply surges.

D. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC instrumentation and controls. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 23 09 00

Section 232300
REFRIGERANT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes refrigerant piping used for air-conditioning applications.

1.2 PERFORMANCE REQUIREMENTS

A. Line Test Pressure for Refrigerant R-22:
   1. Suction Lines for Air-Conditioning Applications: 185 psig.
   2. Suction Lines for Heat-Pump Applications: 325 psig.
   3. Hot-Gas and Liquid Lines: 325 psig.

1.3 SUBMITTALS

A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop based on manufacturer's test data.

B. Shop Drawings: Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, oil traps, double risers, wall and floor penetrations, and equipment connection details. Show interface and spatial relationships between piping and equipment.
   1. Refrigerant piping indicated on Drawings is schematic only as minimum sizes, enlarge as necessary per description below. Size piping and design actual piping layout, including oil traps, double risers, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.

C. Field quality-control test reports.

D. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

B. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.5 PRODUCT STORAGE AND HANDLING

A. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior are clean when installed.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Copper Tube: ASTM B 88, Type K or L or ASTM B 280, Type ACR.

B. Wrought-Copper Fittings: ASME B16.22.

C. Wrought-Copper Unions: ASME B16.22.

D. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.

E. Brazing Filler Metals: AWS A5.8.

F. Flexible Connectors:
   1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
   2. End Connections: Socket ends, union, threaded or flanged.
   3. Offset Performance: Capable of minimum 3/4-inch misalignment in minimum 7-inch- long assembly.
   4. Pressure Rating: Factory test at minimum 500 psig.
   5. Maximum Operating Temperature: 250 deg F.

2.2 VALVES AND SPECIALTIES

A. Diaphragm Packless Valves:
   1. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.
   2. Diaphragm: Phosphor bronze and stainless steel with stainless-steel spring.
   3. Operator: Rising stem and hand wheel.

4. Seat: Nylon.
5. End Connections: Socket, union, threaded or flanged.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 275 deg F.

B. Packed-Angle Valves:
1. Body and Bonnet: Forged brass or cast bronze.
2. Packing: Molded stem, back seating, and replaceable under pressure.
3. Operator: Rising stem.
4. Seat: Nonrotating, self-aligning polytetrafluoroethylene.
5. Seal Cap: Forged-brass or valox hex cap.
6. End Connections: Socket, union, threaded, or flanged.
7. Working Pressure Rating: 500 psig.
8. Maximum Operating Temperature: 275 deg F.

C. Check Valves:
1. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
2. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
3. Piston: Removable polytetrafluoroethylene seat.
4. Closing Spring: Stainless steel.
5. Manual Opening Stem (optional): Seal cap, plated-steel stem, and graphite seal.
6. End Connections: Socket, union, threaded, or flanged.
7. Maximum Opening Pressure: 0.50 psig.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 275 deg F.

D. Service Valves:
1. Body: Forged brass with brass cap including key end to remove core.
2. Core: Removable ball-type check valve with stainless-steel spring.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Copper spring.
5. Working Pressure Rating: 500 psig.

E. Solenoid Valves: Comply with ARI 760 and UL 429; listed and labeled by an NRTL.
1. Body and Bonnet: Plated steel.
2. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Threaded or flanged.
5. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter, and 24 or 115 or 208-V ac coil.
6. Working Pressure Rating: 400 psig.
7. Maximum Operating Temperature: 240 deg F.
8. Manual operator (optional).

F. Safety Relief Valves: Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
1. Body and Bonnet: Ductile iron and steel, with neoprene O-ring seal.
2. Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Seat Disc: Polytetrafluoroethylene.
4. End Connections: Threaded or flanged.
5. Working Pressure Rating: 400 psig.
6. Maximum Operating Temperature: 240 deg F.

G. Thermostatic Expansion Valves: Comply with ARI 750.
1. Body, Bonnet, and Seal Cap: Forged brass or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.
4. Capillary and Bulb: Copper tubing filled with refrigerant charge.
5. Suction Temperature: 40 deg F.
6. Superheat: Adjustable.
7. Reverse-flow option (for heat-pump applications).
8. End Connections: Socket, flare, or threaded union.

9. Working Pressure Rating: 700 psig.

H. Straight-Type Strainers:
1. Body: Welded steel with corrosion-resistant coating.
2. Screen: 100-mesh stainless steel.
3. End Connections: Socket or flare.
4. Working Pressure Rating: 500 psig.
5. Maximum Operating Temperature: 275 deg F.

I. Angle-Type Strainers:
1. Body: Forged brass or cast bronze.
2. Drain Plug: Brass hex plug.
3. Screen: 100-mesh monel.
4. End Connections: Socket or flare.
5. Working Pressure Rating: 500 psig.
6. Maximum Operating Temperature: 275 deg F.

J. Moisture/Liquid Indicators:
1. Body: Forged brass.
2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
3. Indicator: Color coded to show moisture content in ppm.
4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
5. End Connections: Socket or flare.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 240 deg F.

K. Replaceable-Core Filter Dryers: Comply with ARI 730.
1. Body and Cover: Painted-steel shell with ductile-iron cover, stainless-steel screws, and neoprene gaskets.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Desiccant Media: Activated alumina.
4. Designed for reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: 2 psig.
8. Rated Flow: 80% of unit tons.
9. Working Pressure Rating: 500 psig.
10. Maximum Operating Temperature: 240 deg F.

L. Permanent Filter Dryers: Comply with ARI 730.
1. Body and Cover: Painted-steel shell.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Desiccant Media: Activated alumina.
4. Designed for reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: 2 psig.
8. Rated Flow: Rated unit tons.
9. Working Pressure Rating: 500 psig.
10. Maximum Operating Temperature: 240 deg F.

M. Liquid Accumulators: Comply with ARI 495.
1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or threaded.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg F.

2.3 REFRIGERANTS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Atofina Chemicals, Inc.
   2. DuPont Company; Fluorochemicals Div.
   3. Honeywell, Inc.; Genetron Refrigerants.
   4. INEOS Fluor Americas LLC.
C. ASHRAE 34, R410A

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Suction Lines NPS 1-1/2 and Smaller for Conventional Air-Conditioning Applications: Copper, Type L or Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.
B. Suction Lines NPS 2 to NPS 4 for Conventional Air-Conditioning Applications: Copper, Type L, drawn-temper tubing and wrought-copper fittings with brazed or soldered joints.
C. Hot-Gas and Liquid Lines, and Suction Lines for Heat-Pump Applications:
   1. NPS 1-1/2 and Smaller: Copper, Type L or ACR, drawn-temper tubing and wrought-copper fittings with brazed or soldered joints.
   2. NPS 2 to NPS 3: Copper, Type K or L, annealed- or drawn-temper tubing and wrought-copper fittings with brazed or soldered joints.
   3. NPS 4: Copper, Type K or L, drawn-temper tubing and wrought-copper fittings with soldered joints.
D. Safety-Relief-Valve Discharge Piping: Copper, Type to match liquid line above, drawn-temper tubing and wrought-copper fittings with soldered or brazed joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

A. Install diaphragm packless or packed-angle valves in suction and discharge lines of compressor.
B. Install service valves for gage taps at strainers if they are not an integral part of strainers.
C. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection as necessary for operation below 75 deg F.
D. Except as otherwise indicated, install diaphragm packless or packed-angle valves on inlet and outlet side of filter dryers.
E. Install solenoid valves upstream from each expansion valve in systems with multiple thermostatic expansion valves. Install solenoid valves in horizontal lines with coil at top.
F. Install thermostatic expansion valves as close as possible to distributors on evaporators.
   1. Install valve so diaphragm case is warmer than bulb.
   2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line. Verify placement with manufacturer.
   3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.
G. Install safety relief valves where required by ASME Boiler and Pressure Vessel Code. Pipe safety-relief-valve discharge line to outside according to ASHRAE 15.
H. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube.
I. Install strainers upstream from and adjacent to the following unless they are furnished as an integral assembly for device being protected:
   1. Solenoid valves.
   2. Thermostatic expansion valves.
   3. Compressor.
J. Install filter dryers in liquid line between compressor and thermostatic expansion valve, and in the suction line at the compressor.
K. Install flexible connectors at compressors.

3.3 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction

loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

B. Install refrigerant piping according to ASHRAE 15.
C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
F. Install piping adjacent to machines to allow service and maintenance.
G. Install piping free of sags and bends.
H. Install fittings for changes in direction and branch connections.
I. Select system components with pressure rating equal to or greater than system operating pressure.
J. Refer to Division 23 Sections "Instrumentation and Control for HVAC" and "Sequence of Operations for HVAC Controls" for solenoid valve controllers, control wiring, and sequence of operation.
K. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
L. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as specified in Division 08 Section "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.
M. Install refrigerant piping in protective conduit where installed belowground.
N. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.
O. Slope refrigerant piping as follows:
    1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
    2. Install horizontal suction lines with a uniform slope downward to compressor.
    3. Install traps and double risers to entrain oil in vertical runs if load variation is expected.
    4. Liquid lines may be installed level.
P. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.
Q. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
R. Identify refrigerant piping and valves according to Division 23 Section "Identification for HVAC Piping and Equipment."
S. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 23 Section "Sleeves and Sleeve Seals for HVAC Piping."
T. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 23 Section "Sleeves and Sleeve Seals for HVAC Piping."
U. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 23 Section "Escutcheons for HVAC Piping."

3.4 PIPE JOINT CONSTRUCTION

A. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."
B. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
    1. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.
    2. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.

3.5 HANGERS AND SUPPORTS

A. Hanger, support, and anchor products are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Install the following pipe attachments:
   1. Adjustable steel clevis hangers for individual horizontal runs less than 30 feet long.
   2. Roller hangers and spring hangers for individual horizontal runs 30 feet or longer.
   3. Spring hangers to support vertical runs.
   4. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

C. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes:
   1. NPS 1/2: Maximum span, 60 inches; minimum rod size, 1/4 inch.
   2. NPS 5/8: Maximum span, 60 inches; minimum rod size, 1/4 inch.
   3. NPS 1: Maximum span, 72 inches; minimum rod size, 1/4 inch.
   4. NPS 1-1/4: Maximum span, 96 inches; minimum rod size, 3/8 inch.
   5. NPS 1-1/2: Maximum span, 96 inches; minimum rod size, 3/8 inch.
   6. NPS 2: Maximum span, 96 inches; minimum rod size, 3/8 inch.
   7. NPS 2-1/2: Maximum span, 108 inches; minimum rod size, 3/8 inch.
   8. NPS 3: Maximum span, 10 feet; minimum rod size, 3/8 inch.
   9. NPS 4: Maximum span, 12 feet; minimum rod size, 1/2 inch.

D. Support multifloor vertical runs at least at each floor.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:
   1. Comply with ASME B31.5, Chapter VI.
   2. Test refrigerant piping and specialties. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
   3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in Part 1 "Performance Requirements" Article.
      a. Fill system with nitrogen to the required test pressure.
      b. System shall maintain test pressure at the manifold gage throughout duration of test.
      c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
      d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

3.7 SYSTEM CHARGING

A. Charge system using the following procedures:
   1. Install core in filter dryers after leak test but before evacuation.
   2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
   3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
   4. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

A. Adjust thermostatic expansion valve if adjustable to obtain proper evaporator superheat.

B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.

C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.

D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
   1. Open shutoff valves in condenser water circuit.
   2. Verify that compressor oil level is correct.
   3. Open compressor suction and discharge valves.
   4. Open refrigerant valves except bypass valves that are used for other purposes.
   5. Check open compressor-motor alignment and verify lubrication for motors and bearings.

E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION 23 23 00

Section 233113
METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Rectangular ducts and fittings.
   2. Round ducts and fittings.
   3. Sheet metal materials.
   4. Sealants and gaskets.
   5. Hangers and supports.
   6. Seismic-restraint devices.

B. Related Sections:
   1. Division 23 Section "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
   2. Division 23 Section "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.

B. Structural Performance: Duct hangers and supports and seismic restraints shall withstand the effects of gravity and seismic loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and ASCE/SEI 7. and SMACNA's "Seismic Restraint Manual: Guidelines for Mechanical Systems.

C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:
   1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
   2. Factory- and shop-fabricated ducts and fittings.
   3. Duct layout indicating sizes, configuration, and static-pressure classes.
   4. Elevation of top of ducts.
   5. Dimensions of main duct runs from building grid lines.
   6. Fittings.
   7. Reinforcement and spacing.
   8. Seam and joint construction.
   9. Penetrations through fire-rated and other partitions.
   10. Equipment installation based on equipment being used on Project.
   11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
   12. Hangers and supports, including methods for duct and building attachment, seismic restraints, and vibration isolation.

C. Delegated-Design Submittal:
   1. Sheet metal thicknesses.
   2. Joint and seam construction and sealing.
   3. Reinforcement details and spacing.
   4. Materials, fabrication, assembly, and spacing of hangers and supports.

D. Coordination Drawings: Plans, drawn to scale (MINIMUM ¼" SCALE), on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
2. Suspended ceiling components.
3. Structural members to which duct will be attached.
4. Size and location of initial access modules for acoustical tile.
5. Penetrations of smoke barriers and fire-rated construction.
6. Items penetrating finished ceiling including the following:
    a. Lighting fixtures.
    b. Air outlets and inlets.
    c. Speakers.
    d. Sprinklers.
    e. Access panels.
    f. Perimeter moldings.
    g. Soffits

E. Welding certificates.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum," for aluminum supports.
3. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

PART 2 - PRODUCTS

2.1 RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Lindab Inc.
    b. McGill AirFlow LLC.
    c. SEMCO Incorporated.
    d. Sheet Metal Connectors, Inc.
    e. Spiral Manufacturing Co., Inc.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for

static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Fabricate round ducts larger Than 90 inches in diameter with butt-welded longitudinal seams.

D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90.
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Carbon-Steel Sheets: Comply with ASTM A 1008/A 1008M, with oiled, matte finish for exposed ducts.

D. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in the "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "Duct Schedule" Article.

E. Aluminum Sheets: Comply with ASTM B 209 Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.

F. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.4 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
2. Tape Width:6 inches.
3. Sealant: Modified styrene acrylic.
4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg F.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
10. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

11. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Water-Based Joint and Seam Sealant:
1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.
1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.
6. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

F. Round Duct Joint O-Ring Seals:
1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.5 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.

C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.

F. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

H. Trapeze and Riser Supports:
1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

2.6 SEISMIC-RESTRAINT DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper B-Line, Inc.; a division of Cooper Industries.
2. Ductmate Industries, Inc.
3. Hilti Corp.
4. Kinetics Noise Control.

5. Loos & Co.; Cableware Division.
6. Mason Industries.
7. TOLCO; a brand of NIBCO INC.
8. Unistrut Corporation; Tyco International, Ltd.

B. Channel Support System: Shop- or field-fabricated support assembly made of slotted steel channels rated in tension, compression, and torsion forces and with accessories for attachment to braced component at one end and to building structure at the other end. Include matching components and corrosion-resistant coating.

C. Restraint Cables: ASTM A 492, stainless-steel cables with end connections made of cadmium-plated steel assemblies with brackets, swivel, and bolts designed for restraining cable service; and with an automatic-locking and clamping device or double-cable clips.

D. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections or Reinforcing steel angle clamped to hanger rod.

E. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install round ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Division 23 Section "Air Duct Accessories" for fire and smoke dampers.

L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

3.2 INSTALLATION OF EXPOSED DUCTWORK

A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

E. Repair or replace damaged sections and finished work that does not comply with these requirements.
F. Coordinate with Architect plans for painting of ductwork.

3.3 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
   1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
   2. Outdoor, Supply-Air Ducts: Seal Class A.
   3. Outdoor, Exhaust Ducts: Seal Class C.
   4. Outdoor, Return-Air Ducts: Seal Class C.
   5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
   6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class A.
   7. Unconditioned Space, Exhaust Ducts: Seal Class C.
   8. Unconditioned Space, Return-Air Ducts: Seal Class B.
   9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
   10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
   11. Conditioned Space, Exhaust Ducts: Seal Class B.
   12. Conditioned Space, Return-Air Ducts: Seal Class C.

3.4 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
   1. Where practical, install concrete inserts before placing concrete.
   2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
   3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
   4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
   5. Do not use powder-actuated concrete fasteners for seismic restraints.
C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
D. Hangers Exposed to View: Threaded rod and angle or channel supports.
E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.5 SEISMIC-RESTRAINT-DEVICE INSTALLATION

A. Install ducts with hangers and braces designed to support the duct and to restrain against seismic forces required by applicable building codes. Comply with SMACNA's "Seismic Restraint Manual: Guidelines for Mechanical Systems." and ASCE/SEI 7]
   1. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
   2. Brace a change of direction longer than 12 feet.

B. Select seismic-restraint devices with capacities adequate to carry present and future static and seismic loads.
C. Install cables so they do not bend across edges of adjacent equipment or building structure.
D. Install cable restraints on ducts that are suspended with vibration isolators.
E. Attachment to Structure: If specific attachment is not indicated, anchor bracing and restraints to structure, to flanges of beams, to upper truss chords of bar joists, or to concrete members.
F. Drilling for and Setting Anchors:
1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcement or embedded items during drilling. Notify the Architect if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Set anchors to manufacturer's recommended torque, using a torque wrench.
5. Install zinc-coated steel anchors for interior applications and stainless-steel anchors for applications exposed to weather.

3.6 CONNECTIONS
A. Make connections to equipment with flexible connectors complying with Division 23 Section "Air Duct Accessories."
B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.7 START UP
A. Air Balance: Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing for HVAC."

3.8 DUCT SCHEDULE
A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:
1. Coordinate duct schedule with drawings.
B. Supply Ducts:
1. Ducts Connected to Fan Coil Units, Furnaces, Heat Pumps, and Terminal Units:
a. Pressure Class: Positive 2-inch wg.
b. Minimum SMACNA Seal Class: A.
c. SMACNA Leakage Class for Rectangular: 12.
d. SMACNA Leakage Class for Round and Flat Oval: 12.
2. Ducts Connected to Constant-Volume Package Air-Handling Units:
a. Pressure Class: Positive 4-inch wg (if noted otherwise on drawings such as 10 inch wg on drawings use pressure class called for on drawings).
b. Minimum SMACNA Seal Class: A.
c. SMACNA Leakage Class for Rectangular: 6.
d. SMACNA Leakage Class for Round and Flat Oval: 6.
3. Ducts Connected to Variable-Air-Volume Package Air-Handling Units:
a. Pressure Class: Positive 4-inch wg (if noted otherwise on drawings such as 10 inch wg on drawings use pressure class called for on drawings)..
b. Minimum SMACNA Seal Class: A.
c. SMACNA Leakage Class for Rectangular: 3.
d. SMACNA Leakage Class for Round and Flat Oval: 3.
4. Ducts Connected to Equipment Not Listed Above:
a. Pressure Class: Positive 4-inch wg (if noted otherwise on drawings such as 10 inch wg on drawings use pressure class called for on drawings)..
b. Minimum SMACNA Seal Class: A.
c. SMACNA Leakage Class for Rectangular: 3.
d. SMACNA Leakage Class for Round and Flat Oval: 3.
C. Return Ducts:

1. Ducts Connected to Fan Coil Units, Furnaces, Heat Pumps, and Terminal Units:
    a. Pressure Class: Positive or negative 2-inch wg.
    b. Minimum SMACNA Seal Class: A.
    c. SMACNA Leakage Class for Rectangular: 12.
    d. SMACNA Leakage Class for Round and Flat Oval: 12.
2. Ducts Connected to Package Air-Handling Units:
    a. Pressure Class: Positive or negative 4-inch wg.
    b. Minimum SMACNA Seal Class: A.
    c. SMACNA Leakage Class for Rectangular: 6.
    d. SMACNA Leakage Class for Round and Flat Oval: 6.
3. Ducts Connected to Equipment Not Listed Above:
    a. Pressure Class: Positive or negative 4-inch wg.
    b. Minimum SMACNA Seal Class: A.
    c. SMACNA Leakage Class for Rectangular: 3.
    d. SMACNA Leakage Class for Round and Flat Oval: 3.

D. Exhaust Ducts:
1. Ducts Connected to Fans Exhausting (ASHRAE 62.1, Class 1 and 2) Air:
    a. Pressure Class: Negative 4-inch wg.
    b. Minimum SMACNA Seal Class: B if negative pressure, and A if positive pressure.
    c. SMACNA Leakage Class for Rectangular: 12.
    d. SMACNA Leakage Class for Round and Flat Oval: 12.
2. Ducts Connected to Equipment Not Listed Above:
    a. Pressure Class: Positive or negative 4-inch wg.
    b. Minimum SMACNA Seal Class: B if negative pressure, and A if positive pressure.
    c. SMACNA Leakage Class for Rectangular: 12.
    d. SMACNA Leakage Class for Round and Flat Oval: 6.

E. Outdoor-Air (Not Filtered, Heated, or Cooled) Ducts:
1. Ducts Connected to Fan Coil Units, Furnaces, Heat Pumps, and Terminal Units:
    a. Pressure Class: Positive or negative 2-inch wg.
    b. Minimum SMACNA Seal Class: B.
    c. SMACNA Leakage Class for Rectangular: 12.
    d. SMACNA Leakage Class for Round and Flat Oval: 12.
2. Ducts Connected to Package Air-Handling Units:
    a. Pressure Class: Positive or negative 4-inch wg.
    b. Minimum SMACNA Seal Class: B.
    c. SMACNA Leakage Class for Rectangular: 6.
    d. SMACNA Leakage Class for Round and Flat Oval: 6.
3. Ducts Connected to Equipment Not Listed Above:
    a. Pressure Class: Positive or negative 4-inch wg.
    b. Minimum SMACNA Seal Class: B.
    c. SMACNA Leakage Class for Rectangular: 6.
    d. SMACNA Leakage Class for Round and Flat Oval: 6.

F. Intermediate Reinforcement:
1. Galvanized-Steel Ducts: Galvanized steel or carbon steel coated with zinc-chromate primer.
2. Stainless-Steel Ducts:
    a. Exposed to Airstream: Match duct material.
    b. Not Exposed to Airstream: Match duct material.
3. Aluminum Ducts: Aluminum or galvanized sheet steel coated with zinc chromate.

G. Elbow Configuration:
1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
    a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
    b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.

c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."
   a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.
      1) Radius-to Diameter Ratio: 1.5.
   b. Round Elbows, 8 Inches and Smaller in Diameter: Stamped or pleated.
   c. Round Elbows, 10 Inches and Larger in Diameter: Standing seam or Welded.

H. Branch Configuration:
1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."
   a. Rectangular Main to Rectangular Branch: 45-degree entry.
   b. Rectangular Main to Round Branch: Spin in.
2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.
   a. Velocity 1000 fpm or Lower: 90-degree tap (only allowed if noted or shown on drawings).
   b. Velocity 1000 to 1200 fpm: Conical tap.
   c. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION 23 31 13

Section 23 33 00
AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Backdraft and pressure relief dampers.
   2. Manual volume dampers.
   3. Control dampers.
   4. Turning vanes.
   5. Duct-mounted access doors.
   6. Flexible connectors.
   7. Flexible ducts.
   8. Duct accessory hardware.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.
   1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
      a. Special fittings.
      b. Manual volume damper installations.
      c. Control damper installations.
      d. Fire-damper and smoke-damper installations, including sleeves; and duct-mounted access doors.
      e. Wiring Diagrams: For power, signal, and control wiring.

C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

B. Comply with AMCA 500-D testing for damper rating.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
   1. Galvanized Coating Designation: G90.
   2. Exposed-Surface Finish: Mill phosphatized.

C. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and No, 4 finish for exposed ducts.

D. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.

E. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.

F. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 BACKDRAFT AND PRESSURE RELIEF DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Air Balance Inc.; a division of Mestek, Inc.

2. American Warming and Ventilating; a division of Mestek, Inc.
3. Duro Dyne Inc.
4. Greenheck Fan Corporation.
5. Nailor Industries Inc.
6. Pottorff; a division of PCI Industries, Inc.
7. Ruskin Company.
8. SEMCO Incorporated.
9. Vent Products Company, Inc.

B. Description: Gravity balanced.
C. Maximum Air Velocity: 2000 fpm.
D. Maximum System Pressure: 4-inch wg.
E. Frame: 0.052-inch- thick, galvanized sheet steel, with welded corners and mounting flange.
F. Blades: Multiple single-piece blades, center-pivoted, maximum 6-inch width, or 0.025-inch-thick, roll-formed aluminum either blade type with sealed edges.
G. Blade Action: Parallel.
H. Blade Seals: Extruded vinyl, mechanically locked or Neoprene, mechanically locked.
I. Blade Axles:
1. Material: Galvanized steel or Stainless steel.
2. Diameter: 0.20 inch.
J. Tie Bars and Brackets: Galvanized steel.
K. Return Spring: Adjustable tension.
L. Bearings: Steel ball.
M. Accessories:
1. Adjustment device to permit setting for varying differential static pressure.
2. Counterweights and spring-assist kits for vertical airflow installations.
3. Electric actuators.
4. Chain pulls.
5. Screen Mounting: Front mounted in sleeve.
a. Sleeve Thickness: 20-gage minimum.
b. Sleeve Length: 6 inches minimum.
6. Screen Mounting: Rear mounted.
7. Screen Material: Galvanized steel.
8. Screen Type: Insect.
9. 90-degree stops.

2.3 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Air Balance Inc.; a division of Mestek, Inc.
b. American Warming and Ventilating; a division of Mestek, Inc.
c. Flexmaster U.S.A., Inc.
d. McGill AirFlow LLC.
e. METALAIRE, Inc.
f. Nailor Industries Inc.
g. Pottorff; a division of PCI Industries, Inc.
h. Ruskin Company.
i. Vent Products Company, Inc.
2. Standard leakage rating, with linkage outside airstream.
3. Suitable for horizontal or vertical applications.
4. Frames:
a. Hat-shaped, galvanized-steel channels, 0.064-inch minimum thickness.
b. Mitered and welded corners.
c. Flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
a. Multiple or single blade.
b. Parallel- or opposed-blade design.

c. Stiffen damper blades for stability.
d. Galvanized-steel, 0.064 inch thick.

6. Blade Axles: Galvanized steel.
7. Bearings:
   a. Oil-impregnated bronze.
   b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
8. Tie Bars and Brackets: Galvanized steel.

B. Standard, Aluminum, Manual Volume Dampers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Air Balance Inc.; a division of Mestek, Inc.
   b. American Warming and Ventilating; a division of Mestek, Inc.
   c. Flexmaster U.S.A., Inc.
   d. McGill AirFlow LLC.
   e. METALAIRE, Inc.
   f. Nailor Industries Inc.
   g. Pottorff; a division of PCI Industries, Inc.
   h. Ruskin Company.
   i. Vent Products Company, Inc.
2. Standard leakage rating, with linkage outside airstream.
3. Suitable for horizontal or vertical applications.
4. Frames: Hat-shaped, 0.10-inch- thick, aluminum sheet channels; frames with flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
   a. Multiple or single blade.
   b. Parallel- or opposed-blade design.
   c. Stiffen damper blades for stability.
   d. Roll-Formed Aluminum Blades: 0.10-inch- thick aluminum sheet or extruded-Aluminum Blades: 0.050-inch- thick extruded aluminum.
6. Blade Axles: Galvanized steel.
7. Bearings:
   a. Oil-impregnated bronze.
   b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
8. Tie Bars and Brackets: Aluminum.

C. Jackshaft:
1. Size: 1-inch diameter.
2. Material: Galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
3. Length and Number of Mountings: As required to connect linkage of each damper in multiple-damper assembly.

D. Damper Hardware:
1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch- thick zinc-plated steel, and a 3/4-inch hexagon locking nut.
2. Include center hole to suit damper operating-rod size.
3. Include elevated platform for insulated duct mounting.

2.4 CONTROL DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Warming and Ventilating; a division of Mestek, Inc.
2. Duro Dyne Inc.
3. Greenheck Fan Corporation.
4. McGill AirFlow LLC.
5. METALAIRE, Inc.
6. Nailor Industries Inc.

7. Ruskin Company.
8. Vent Products Company, Inc.

B. Frames:
1. Hat or Angle shaped.
2. Galvanized-steel channels, 0.064 inch thick.
3. Mitered and welded corners.

C. Blades:
1. Multiple blade with maximum blade width of 8 inches.
2. For two-position (full open or closed) control provide parallel. For Modulating control provide opposed-blade design.
3. Galvanized steel.
4. 0.064 inch thick.
5. Blade Edging: Closed-cell neoprene edging or replaceable rubber edging.

D. Blade Axles: 1/2-inch- diameter; galvanized steel; blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.
1. Operating Temperature Range: From minus 40 to plus 200 deg F.

E. Bearings:
1. Oil-impregnated bronze.
2. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
3. Thrust bearings at each end of every blade.

2.5 TURNING VANES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ductmate Industries, Inc.
2. Duro Dyne Inc.
3. METALAIRE, Inc.
4. SEMCO Incorporated.
5. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

C. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

D. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."

E. Vane Construction: Single or Double wall.

F. Vane Construction: Single wall for ducts up to 48 inches wide and double wall for larger dimensions.

2.6 DUCT-MOUNTED ACCESS DOORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Warming and Ventilating; a division of Mestek, Inc.
2. Cesco Products; a division of Mestek, Inc.
3. Ductmate Industries, Inc.
4. Flexmaster U.S.A., Inc.
5. Greenheck Fan Corporation.
6. McGill AirFlow LLC.
7. Nailor Industries Inc.
8. Pottorff; a division of PCI Industries, Inc.
9. Ventfabrics, Inc.
10. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 7-2, "Duct Access Doors and Panels," and 7-3, "Access Doors - Round Duct."
   1. Door:
      a. Double wall, rectangular.
      b. Galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class.
      c. Vision panel.
      d. Hinges and Latches: 1-by-1-inch butt or piano hinge and cam latches.
      e. Fabricate doors airtight and suitable for duct pressure class.
   2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
   3. Number of Hinges and Locks:
      a. Access Doors Less Than 12 Inches Square: No hinges and two sash locks.
      b. Access Doors up to 18 Inches Square: Two hinges and two sash locks.
      c. Access Doors up to 24 by 48 Inches: Three hinges and two compression latches with outside and inside handles.
      d. Access Doors Larger Than 24 by 48 Inches: Four hinges and two compression latches with outside and inside handles.

C. Pressure Relief Access Door:
   1. Door and Frame Material: Galvanized sheet steel.
   2. Door: Single wall or Double wall with insulation fill with metal thickness applicable for duct pressure class to match duct or plenum.
   3. Operation: Open outward for positive-pressure ducts and inward for negative-pressure ducts.
   4. Factory set at pressure noted on plans.
   5. Doors close when pressures are within set-point range.
   6. Hinge: Continuous piano.
   7. Latches: Cam.
   8. Seal: Neoprene or foam rubber.
   9. Insulation Fill: 1-inch- thick, fibrous-glass or polystyrene-foam board.

2.7 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Ductmate Industries, Inc.
   2. Duro Dyne Inc.
   3. Ventfabrics, Inc.
   4. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Materials: Flame-retardant or noncombustible fabrics.

C. Coatings and Adhesives: Comply with UL 181, Class 1.

D. Metal-Edged Connectors: Factory fabricated with a fabric strip 3-1/2 inches to 5-3/4 inches wide attached to 2 strips of 2-3/4-inch- wide, 0.028-inch- thick, galvanized sheet steel. Provide metal compatible with connected ducts.

E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
   1. Minimum Weight: 26 oz./sq. yd..
   2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
   3. Service Temperature: Minus 40 to plus 200 deg F.

F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.
   1. Minimum Weight: 24 oz./sq. yd..
   2. Tensile Strength: 530 lbf/inch in the warp and 440 lbf/inch in the filling.
   3. Service Temperature: Minus 50 to plus 250 deg F.

G. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.
   1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.

2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-inch movement at start and stop.

2.8 FLEXIBLE DUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Flexmaster U.S.A., Inc.
2. McGill AirFlow LLC.
3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Noninsulated, Flexible Duct: UL 181, Class 1, black polymer film supported by helically wound, spring-steel wire.
1. Pressure Rating: 4-inch wg positive and 0.5-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Temperature Range: Minus 20 to plus 175 deg F.

C. Insulated, Flexible Duct: UL 181, Class 1, black polymer film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene or aluminized vapor-barrier film.
1. Pressure Rating: 4-inch wg positive and 0.5-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Temperature Range: Minus 20 to plus 175 deg F.
4. Insulation R-Value: Comply with ASHRAE/IESNA 90.1 and California Title 24.

D. Flexible Duct Connectors:
1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.
2. Non-Clamp Connectors: Adhesive plus sheet metal screws.

2.9 DUCT ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.

B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.

B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

C. Install backdraft dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.

D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
1. Install steel volume dampers in steel ducts.
2. Install aluminum volume dampers in aluminum ducts.

E. Set dampers to fully open position before testing, adjusting, and balancing.

F. Install test holes at fan inlets and outlets and elsewhere as indicated.

G. Install fire and smoke dampers according to UL listing.

H. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
   1. On both sides of duct coils.
   2. Upstream and downstream from duct filters.
   3. At outdoor-air intakes and mixed-air plenums.
   4. At drain pans and seals.
   5. Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.
   6. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors; and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
   7. At each change in direction and at maximum 50-foot spacing.
   8. Upstream and downstream from turning vanes.
   9. Control devices requiring inspection.
   10. Elsewhere as indicated.

I. Install access doors with swing against duct static pressure.

J. Access Door Sizes:
   1. One-Hand or Inspection Access: 8 by 5 inches.
   2. Two-Hand Access: 12 by 6 inches.
   3. Head and Hand Access: 18 by 10 inches.
   4. Head and Shoulders Access: 21 by 14 inches.
   5. Body Access: 25 by 14 inches.
   6. Body plus Ladder Access: 25 by 17 inches.

K. Label access doors according to Division 23 Section "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.

L. Install flexible connectors to connect ducts to equipment.

M. For fans developing static pressures of 5-inch wg and more, cover flexible connectors with loaded vinyl sheet held in place with metal straps.

N. Connect flexible ducts to metal ducts with draw bands or adhesive plus sheet metal screws.

O. Install duct test holes where required for testing and balancing purposes.

P. Install thrust limits at centerline of thrust, symmetrical on both sides of equipment. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch movement during start and stop of fans.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. Operate dampers to verify full range of movement.
   2. Inspect locations of access doors and verify that purpose of access door can be performed.
   3. Operate fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.
   4. Inspect turning vanes for proper and secure installation.

END OF SECTION 23 33 00

Section 23 34 23
HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Centrifugal roof exhaust fans.

1.3 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base fan-performance ratings on sea level.
B. Operating Limits: Classify according to AMCA 99.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Also include the following:
   1. Certified fan performance curves with system operating conditions indicated.
   2. Certified fan sound-power ratings.
   3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
   4. Material thickness and finishes, including color charts.
   5. Dampers, including housings, linkages, and operators.
   6. Roof curbs.
   7. Fan speed controllers.
B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Wiring Diagrams: For power, signal, and control wiring.
C. Delegated-Design Submittal: For unit hangars and supports indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
   1. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
   2. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
D. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
   1. Roof framing and support members relative to duct penetrations.
   2. Ceiling suspension assembly members.
   3. Size and location of initial access modules for acoustical tile.
   4. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
E. Field quality-control reports.
F. Operation and Maintenance Data: For power ventilators to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
B. AMCA Compliance: Fans shall have AMCA-Certified performance ratings and shall bear the AMCA-Certified Ratings Seal.
C. UL Standards: Power ventilators shall comply with UL 705. Power ventilators for use for restaurant kitchen exhaust shall also comply with UL 762.

1.6 COORDINATION
- A. Coordinate size and location of structural-steel support members.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided.
- C. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

1.7 EXTRA MATERIALS
- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Belts: One set for each belt-driven unit.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL ROOF VENTILATORS
- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  1. Acme Engineering & Manufacturing Corporation.
  2. Greenheck Fan Corporation.
  3. Loren Cook Company.
- B. Housing: Removable, spun-aluminum, dome top and outlet baffle; square, one-piece, aluminum base with venturi inlet cone.
  1. Upblast Units: Provide spun-aluminum discharge baffle to direct discharge air upward, with rain and snow drains.
  2. Hinged Subbase: Galvanized-steel hinged arrangement permitting service and maintenance.
- C. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.
- D. Belt Drives:
  1. Resiliently mounted to housing.
  2. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.
  3. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
  4. Pulleys: Cast-iron, adjustable-pitch motor pulley.
  5. Fan and motor isolated from exhaust airstream.
- E. Direct drives:
  1. For 120V motor provide factory speed controller.
- F. Accessories:
  1. Variable-Speed Controller if specified on drawings: Solid-state control to reduce speed from 100 to less than 50 percent.
  2. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted **inside** or **outside** fan housing, factory wired through an internal aluminum conduit.
  3. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
  4. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.
  5. Motorized Dampers: Parallel-blade dampers mounted in curb base with electric actuator; wired to close when fan stops.
- G. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.
  1. Configuration: Built-in cant and mounting flange.
  2. Overall Height: 12 inches.
  3. Sound Curb: Curb with sound-absorbing insulation.
  4. Pitch Mounting: Manufacture curb for roof slope.
  5. Metal Liner: Galvanized steel.
  6. Burglar Bars: 5/8-inch-thick steel bars welded in place to form 6-inch squares.
  7. Mounting Pedestal: Galvanized steel with removable access panel.
  8. Vented Curb: Unlined with louvered vents in vertical sides.

2.2 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
   1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
   2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Division 26 Sections.

B. Enclosure Type: Totally enclosed, fan cooled.

2.3 SOURCE QUALITY CONTROL

A. Certify sound-power level ratings according to AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.

B. Certify fan performance ratings, including flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating." Label fans with the AMCA-Certified Ratings Seal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install power ventilators level and plumb.

B. Secure roof-mounted fans to roof curbs with cadmium-plated hardware. See Division 07 Section "Roof Accessories" for installation of roof curbs.

C. Ceiling Units: Suspend units from structure; use steel wire or metal straps.

D. Install units with clearances for service and maintenance.

E. Label units according to requirements specified in Division 23 Section "Identification for HVAC Piping and Equipment."

3.2 CONNECTIONS

A. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 Section "Air Duct Accessories."

B. Install ducts adjacent to power ventilators to allow service and maintenance.

C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:
   1. Verify that shipping, blocking, and bracing are removed.
   2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
   3. Verify that cleaning and adjusting are complete.
   4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
   5. Adjust belt tension.
   6. Adjust damper linkages for proper damper operation.
   7. Verify lubrication for bearings and other moving parts.
   8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.

9. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.
10. Shut unit down and reconnect automatic temperature-control operators.
11. Remove and replace malfunctioning units and retest as specified above.

C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Adjust belt tension.

C. Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.

D. Replace fan and motor pulleys as required to achieve design airflow.

E. Lubricate bearings.

END OF SECTION 23 34 23

Section 23 74 13
PACKAGED, OUTDOOR, CENTRAL-STATION AIR-HANDLING UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes packaged, outdoor, central-station air-handling units (rooftop units) with the following components and accessories:
   1. Direct-expansion cooling.
   2. Gas furnace.
   3. Integral, space temperature controls.
   4. Support curbs.

1.2 DEFINITIONS

A. Outdoor-Air Refrigerant Coil: Refrigerant coil in the outdoor-air stream to reject heat during cooling operations and to absorb heat during heating operations. "Outdoor air" is defined as the air outside the building or taken from outdoors and not previously circulated through the system.

B. Outdoor-Air Refrigerant-Coil Fan: The outdoor-air refrigerant-coil fan in RTUs. "Outdoor air" is defined as the air outside the building or taken from outdoors and not previously circulated through the system.

C. RTU: Rooftop unit. As used in this Section, this abbreviation means packaged, outdoor, central-station air-handling units. This abbreviation is used regardless of whether the unit is mounted on the roof or on a concrete base on ground.

D. Supply-Air Fan: The fan providing supply-air to conditioned space. "Supply air" is defined as the air entering a space from air-conditioning, heating, or ventilating apparatus.

E. Supply-Air Refrigerant Coil: Refrigerant coil in the supply-air stream to absorb heat (provide cooling) during cooling operations and to reject heat (provide heating) during heating operations. "Supply air" is defined as the air entering a space from air-conditioning, heating, or ventilating apparatus.

F. VVT: Variable-air volume and temperature.

1.3 PERFORMANCE REQUIREMENTS

A. Wind-Restraint Performance:
   1. Basic Wind Speed: 50 mph.
   2. Minimum 10 lb/sq. ft multiplied by the maximum area of the mechanical component projected on a vertical plane that is normal to the wind direction, and 45 degrees either side of normal.

B. Seismic Performance: RTUs shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
   1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

1.4 SUBMITTALS

A. Product Data: Include manufacturer's technical data for each RTU, including rated capacities, dimensions, required clearances, characteristics, furnished specialties, and accessories.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   1. Wiring Diagrams: Power, signal, and control wiring.

C. Field quality-control test reports.

D. Operation and maintenance data.

E. Warranty.

1.5 QUALITY ASSURANCE

A. ARI Compliance:
   1. Comply with current ARI 210/240 and ARI 340/360 for testing and rating energy efficiencies for RTUs.
   2. Comply with current ARI 270 for testing and rating sound performance for RTUs.

B. ASHRAE Compliance:
   1. Comply with ASHRAE 15 for refrigerant system safety.

2. Comply with ASHRAE 33 for methods of testing cooling and heating coils.
3. Comply with applicable requirements in ASHRAE 62.1-2019, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

C. ASHRAE/IESNA 90.1-2019 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2019, Section 6 - "Heating, Ventilating, and Air-Conditioning."
D. NFPA Compliance: Comply with current NFPA 90A and NFPA 90B.
E. UL Compliance: Comply with UL 1995.
F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in current NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace components of RTUs that fail in materials or workmanship within specified warranty period.
1. Warranty Period for Compressors: Manufacturer's standard, but not less than five years from date of Substantial Completion.
2. Warranty Period for Gas Furnace Heat Exchangers: Manufacturer's standard, but not less than 15 years from date of Substantial Completion.
3. Warranty Period for Solid-State Ignition Modules: Manufacturer's standard, but not less than three years from date of Substantial Completion.
4. Warranty Period for Control Boards: Manufacturer's standard, but not less than three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
C. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:

1. Carrier Corporation.
2. Trane; American Standard Companies, Inc.
3. YORK International Corporation.

2.2 CASING

A. General Fabrication Requirements for Casings: Formed and reinforced double-wall insulated panels, fabricated to allow removal for access to internal parts and components, with joints between sections sealed.
B. Exterior Casing Material: Galvanized steel with factory-painted finish, with pitched roof panels and knockouts with grommet seals for electrical and piping connections and lifting lugs.
1. Exterior Casing Thickness: 0.052 inch to 0.079 inch thick.
C. Inner Casing Fabrication Requirements:
1. Inside Casing: Galvanized steel, 0.034 inch to 0.028 inch thick, perforated 40 percent free area.
D. Casing Insulation and Adhesive: Comply with NFPA 90A or NFPA 90B.
1. Materials: ASTM C 1071, Type I.
2. Thickness: 1 inch.
3. Liner materials shall have air-stream surface coated with an erosion- and temperature-resistant coating or faced with a plain or coated fibrous mat or fabric.
4. Liner Adhesive: Comply with ASTM C 916, Type I.
E. Condensate Drain Pans: Formed sections of stainless-steel sheet, a minimum of 2 inches deep, and complying with ASHRAE 62.1-2004.
1. Double-Wall Construction: Fill space between walls with foam insulation and seal moisture tight.
2. Drain Connections: Threaded nipple one or both sides of pan.
3. Pan-Top Surface Coating: Corrosion-resistant compound.

F. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

2.3 FANS

A. Direct-Driven Supply-Air Fans: Double width, forward curved or backward inclined or airfoil, centrifugal; with permanently lubricated, ECM motor resiliently mounted in the fan inlet. Aluminum or painted-steel wheels, and galvanized- or painted-steel fan scrolls.

B. Belt-Driven Supply-Air Fans: Double width, forward curved, centrifugal; with permanently lubricated, single-speed motor installed on an adjustable fan base resiliently mounted in the casing. Aluminum or painted-steel wheels, and galvanized- or painted-steel fan scrolls.

C. Condenser-Coil Fan: Propeller, mounted on shaft of permanently lubricated motor.

D. Relief-Air Fan: Forward curved or Backward inclined, shaft mounted on permanently lubricated motor.

E. Seismic Fabrication Requirements: Fabricate fan section, internal mounting frame and attachment to fans, fan housings, motors, casings, accessories, and other fan section components with reinforcement strong enough to withstand seismic forces defined in Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment" when fan-mounted frame and RTU-mounted frame are anchored to building structure.

F. Fan Motor: Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."

2.4 COILS

A. Supply-Air Refrigerant Coil:
   1. Aluminum-plate fin and seamless copper tube in steel casing with equalizing-type vertical distributor.
   2. Coil Split: Interlaced.
   3. Condensate Drain Pan: Stainless steel formed with pitch and drain connections complying with ASHRAE 62.1-2019.

B. Outdoor-Air Refrigerant Coil:
   1. Aluminum-plate fin and seamless copper tube in steel casing with equalizing-type vertical distributor.

2.5 REFRIGERANT CIRCUIT COMPONENTS

A. Number of Refrigerant Circuits: One or Two.

B. Compressor: Hermetic, reciprocating or Semihermetic, reciprocating or Hermetic, scroll, mounted on vibration isolators; with internal overcurrent and high-temperature protection, internal pressure relief, and crankcase heater.

C. Refrigeration Specialties:
   1. Refrigerant: R-410A.
   2. Expansion valve with replaceable thermostatic element.
   3. Refrigerant filter/dryer.
   4. Manual-reset high-pressure safety switch.
   5. Automatic-reset low-pressure safety switch.
   6. Minimum off-time relay.
   7. Automatic-reset compressor motor thermal overload.
   8. Brass service valves installed in compressor suction and liquid lines.

2.6 AIR FILTRATION

A. Minimum arrestance according to ASHRAE 52.1, and a minimum efficiency reporting value (MERV 13) according to ASHRAE 52.2.
   1. See filter schedules on drawings for Merv rating and efficiency.

2.7 GAS FURNACE

A. Description: Factory assembled, piped, and wired; complying with ANSI Z21.47 and NFPA 54.
   1. CSA Approval: Designed and certified by and bearing label of CSA.

B. Burners: Stainless steel.
   1. Fuel: Natural gas.
   2. Ignition: Electronically controlled electric spark or hot-surface igniter with flame sensor.
   3. High-Altitude Model: For Project elevations more than 2000 feet above sea level.

C. Heat-Exchanger and Drain Pan: Stainless steel.

D. Venting: Gravity vented with vertical extension if shown on drawings.

E. Power Vent: Integral, motorized centrifugal fan interlocked with gas valve with vertical extension if shown on drawings.
F. Safety Controls:
1. Gas Control Valve: Modulating or two stage.
2. Gas Train: Single-body, regulated, redundant, 24-V ac gas valve assembly containing pilot solenoid valve, pilot filter, pressure regulator, pilot shutoff, and manual shutoff.

2.8 DAMPERS

A. Outdoor- and Return-Air Mixing and Exhaust Air Dampers: Opposed-blade motorized galvanized-steel dampers mechanically fastened to cadmium plated for galvanized-steel operating rod in reinforced cabinet. Connect operating rods with common linkage and interconnect linkages so dampers operate simultaneously.
1. Damper Motor: Modulating with adjustable minimum position.
2. Relief-Air Damper: Gravity actuated or motorized, as required by ASHRAE/IESNA 90.1-2004, with bird screen and hood.

2.9 ELECTRICAL POWER CONNECTION

A. Provide for single connection of power to unit with unit-mounted disconnect switch accessible from outside unit and control-circuit transformer with built-in overcurrent protection. Provide separate 120 V service outlet at unit with separate disconnect from unit disconnect.

2.10 CONTROLS

A. Control equipment and sequence of operation are specified in Division 23 Section "Instrumentation and Control for HVAC."
B. Basic Unit Controls:
1. Control-voltage transformer.
2. Wall-mounted thermostat or sensor with the following features:
a. Heat-cool-off switch.
b. Fan on-auto switch.
c. Fan-speed switch.
d. Automatic changeover.
e. Adjustable deadband.
f. Concealed or Exposed set point.
g. Concealed or Exposed indication.
h. Degree F indication.
i. Unoccupied-period-override push button.
j. Data entry and access port to input temperature set points, occupied and unoccupied periods, and output room temperature, supply-air temperature, operating mode, and status.
3. Unit-Mounted Annunciator Panel for Each Unit:
a. Lights to indicate power on, cooling, heating, fan running, filter dirty, and unit alarm or failure.
b. DDC controller or programmable timer and interface with HVAC instrumentation and control system.
c. Digital display of outdoor-air temperature, supply-air temperature, return-air temperature, economizer damper position, indoor-air quality, and control parameters.
C. Electronic DDC Unit controls by unit manufacturer with DDC Controller:
1. Controller shall have volatile-memory backup.
2. Safety Control Operation:
a. Smoke Detectors: Stop fan and close outdoor-air damper if smoke is detected. Provide additional contacts for alarm interface to fire alarm control panel.
b. Firestats: Stop fan and close outdoor-air damper if air greater than 120 deg F enters unit. Provide additional contacts for alarm interface to fire alarm control panel.
c. Fire Alarm Control Panel Interface if any: Provide control interface to coordinate with operating sequence described in Division 28 Section "Fire Detection and Alarm."

3. Scheduled Operation: Occupied and unoccupied periods on seven-day clock with a minimum of four programmable periods per day.
4. Unoccupied Period:
   a. Heating Setback: 55 deg F.
   b. Cooling Setback: 85 deg F.
   c. Override Operation: Adjustabel from o to 4 hours.
5. Supply Fan Operation:
   a. Occupied Periods: Run fan continuously.
   b. Unoccupied Periods: Cycle fan to maintain setback temperature.
6. Refrigerant Circuit Operation:
   a. Occupied Periods: Cycle or stage compressors to match compressor output to cooling load to maintain room temperature. Cycle condenser fans to maintain maximum hot-gas pressure.
   b. Unoccupied Periods: Compressors off.
7. Gas Furnace Operation:
   a. Occupied Periods: Modulate or stage burner to maintain room temperature.
   b. Unoccupied Periods: Cycle burner to maintain setback temperature.
8. Fixed Minimum Outdoor-Air Damper Operation:
   a. Occupied Periods: Open to air balance setpoint.
   b. Unoccupied Periods: Close the outdoor-air damper.

2.11 ACCESSORIES

A. Duplex, 115-V, ground-fault-interrupter outlet for servicing with 20-A overcurrent protection. Include transformer if required. Outlet shall be energized even if the unit main disconnect is open.
B. Filter differential pressure switch with sensor tubing on either side of filter. Set for final filter pressure loss.
C. Coil guards of painted, galvanized-steel wire.

2.12 SUPPORT CURBS

A. Materials: Galvanized steel with corrosion-protection coating, watertight gaskets, and factory-installed wood nailer; complying with NRCA standards. Coordinate with air handler schedule notes on drawings.
B. Curb Height: minimum 14 inches.
C. Wind and Seismic Restraints: Metal brackets compatible with the curb and casing, painted to match RTU, used to anchor unit to the curb, and designed for loads at Project site.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Equipment Support: Install unit level on structural support curb shown on drawings. Coordinate wall penetrations and flashing with wall construction. Secure RTUs to structural support with anchor bolts.
B. Install wind and seismic restraints according to manufacturer's written instructions. Install condensate drain, minimum connection size, with trap and indirect connection to nearest roof drain or area drain.
C. Install piping adjacent to RTUs to allow service and maintenance.
   1. Gas Piping: Comply with applicable requirements in Division 23 Section "Facility Natural-Gas Piping or Facility Liquefied-Petroleum Gas Piping." Connect gas piping to burner, full size of gas train inlet, and connect with union and gas shutoff valve and gas flex with sufficient clearance for burner removal and service.
D. Duct installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of ducts. The following are specific connection requirements:
   1. Connect supply ducts and return ducts to RTUs with flexible duct connectors specified in Division 23 Section "Air Duct Accessories."

3.2 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.

B. Perform tests and inspections and prepare test reports.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing. Report results in writing to Architect and Engineer.

C. Tests and Inspections:
   1. After installing RTUs and after electrical circuitry has been energized, test units for compliance with requirements.
   2. Inspect for and remove shipping bolts, blocks, and tie-down straps.
   3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
   4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Remove and replace malfunctioning units and retest as specified above.

E. Commissioning agent requirements:

   1. If commissioning required for building provide unit test data to commissioning agent.

3.3 CLEANING AND ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to one visit to site during other-than-normal occupancy hours for this purpose.

B. After completing system installation and testing, adjusting, and balancing RTU and air-distribution systems, clean filter housings and install new air filters.

END OF SECTION 23 74 13

Section 23 81 26
SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes split-system air-conditioning and heat-pump units consisting of separate evaporator-fan and compressor-condenser components.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

C. Operation and maintenance data.

D. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE Compliance:

1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
2. Applicable requirements in ASHRAE 62.1-2019, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - " Procedures," and Section 7 - "Construction and System Start-Up."

C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2019.

1.4 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

1. Warranty Period:
   a. For Compressor: Five year(s) from date of Substantial Completion.
   b. For Parts: One year(s) from date of Substantial Completion.
   c. For Labor: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Carrier Corporation; Home Comfort and HVAC Building & Industrial Systems.
2. Mitsubishi Electric & Electronics USA, Inc.; HVAC Advanced Products Division.
3. YORK International Corporation.
4. Trane; a business of American Standard companies.

2.2 INDOOR UNITS 5 TONS OR LESS

a.

B. Wall-Mounted, Evaporator-Fan Components:

1. Cabinet: Enameled steel with removable panels on front and ends in color selected by Architect, and discharge drain pans with drain connection.
2. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 210/240.
3. Fan: Direct drive, centrifugal.
4. Fan Motors:
   a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
   b. Multitapped, multispeed with internal thermal protection and permanent lubrication.

c. Enclosure Type: Totally enclosed, fan cooled.
d. NEMA Premium (TM) efficient motors as defined in NEMA MG 1.
e. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Division 26 Sections.
f. Mount unit-mounted disconnect switches on exterior or interior of unit.

5. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2019.
6. Condensate Drain Pans:
   a. Fabricated with two percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and humidifiers, and to direct water toward drain connection.
      1) Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1-2019.
      2) Depth: A minimum of 1 inches deep.
   b. Single-wall, stainless-steel sheet.
   c. Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on one end of pan.
      1) Minimum Connection Size: NPS 1, coordinate with sizes shown on plans.
7. Air Filtration Section:
   a. General Requirements for Air Filtration Section:
      1) Comply with NFPA 90A.
      2) Minimum Arrestance: According to ASHRAE 52.1 and MERV according to ASHRAE 52.2.
      3) Filter-Holding Frames: Arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lifted out from access plenum.
   b. Extended-Surface, Disposable Panel Filters:
      1) Factory-fabricated, dry, extended-surface type.
      2) Mounting Frames: Welded, galvanized steel, with gaskets and fasteners; suitable for bolting together into built-up filter banks.

2.3 OUTDOOR UNITS 5 TONS OR LESS)

A. Air-Cooled, Compressor-Condenser Components:
   1. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.
   2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.
      a. Compressor Type: Scroll.
      b. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
      c. Refrigerant Charge: R-410A.
      d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 210/240.
   3. Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.
   4. Fan: Aluminum-propeller type, directly connected to motor.
   5. Motor: Permanently lubricated, with integral thermal-overload protection.
   6. Low Ambient Kit: Permits operation down to 45 deg F.
   7. Mounting Base: Polyethylene.

2.4 ACCESSORIES

A. Control equipment and sequence of operation are specified in Division 23 Sections "Instrumentation and Control for HVAC" and "Sequence of Operations for HVAC Controls."
B. Thermostat: Low voltage with subbase to control compressor and evaporator fan.
C. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:

1. Compressor time delay.
2. 24-hour time control of system stop and start.
3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
4. Fan-speed selection including auto setting.
5. Four programmable setback periods minimum.
6. Heating and cooling modes.
7. 7-day programmable type thermostat to meet Title 24 standards.

D. Automatic-reset timer to prevent rapid cycling of compressor.

E. Refrigerant Line Kits: Soft-annealed or hard type L copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

F. Drain Hose: For condensate.

2.5 CAPACITIES AND CHARACTERISTICS

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

C. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.

C. Duct Connections: Duct installation requirements are specified in Division 23 Section "Metal Ducts" Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Division 23 Section "Air Duct Accessories."

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

D. Prepare test and inspection reports.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 23 81 26

Division 24 and 25 - UNASSIGNED

NOT USED

* End Division 25 *

Division 26 - ELECTRICAL

Section 26 05 00
ELECTRICAL WORK – GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 CONDITIONS:

1.2 The Requirements of General Conditions and Special Conditions apply to Work of this Section as if fully repeated herein.

A. Drawings and specifications take precedence when they call for materials or construction methods of better quality or larger size than required by codes laws, rules, or regulations.

B. The Requirements of this Section apply to all Work of Division 26 AND 27.

1.3 WORK INCLUDED:

A. Provide a complete working installation with all material and equipment as shown and specified. The Contract Documents do not undertake to show or specify every item to be provided. When an item not shown or specified is necessary for proper operation of equipment shown or specified, provide the item, which will allow the system to function properly, at no increase in Contract Price.

B. Make electrical connections for equipment furnished as part of Work of other Sections.

C. Perform necessary equipment seismic anchorage in compliance with the California Building Code Title 24, and requirements of any local agency having authority.

D. The drawings indicate the arrangements of electrical equipment. Review architectural drawings and details for door swings, cabinets, counters, and built-in equipment; conditions indicated on architectural plans shall govern. Coordinate installation of electrical equipment with structural system and mechanical equipment and access thereto. Coordinate installation of recessed electrical equipment with concealed ductwork and piping, and wall thickness.

E. Equipment layout is based on one manufacturer's product or from composite dimensions from multiple manufacturers. Where equipment selected for use on the job differs from layout, coordinate space requirements and connection arrangements with Engineer. Equipment which exceeds specified maximum dimensions or which reduces required clearances shall not be accepted.

1.4 QUALITY ASSURANCE:

A. Requirements of Regulatory Agencies:

1. As specified in Division 1 - General Requirements.
2. Nothing in the Contract Documents shall be construed to permit Work not conforming to applicable laws, ordinances, rules, or regulations.
3. When the Contract Documents exceed requirements of applicable laws, ordinances, rules or regulations, Contract Documents shall take precedence.
4. It is not the intent of the Contract Documents to repeat requirements of Codes except where necessary for completeness or clarity.
5. All installed or connected equipment shall be labeled or certified for its use by a nationally recognized testing laboratory. Where equipment is not furnished with a factory installed label or certification, it shall be the responsibility of the contractor to obtain and pay for the necessary tests and approvals.

1.5 SUBMITTALS:

A. General:

1. Submit Shop Drawings and supplemental data for all materials and equipment specified in all Sections of this Division, in accordance with the Requirements of Division 1, and as specified hereinafter.
2. Submittals shall have materials proposed for the project identified. Catalog cuts containing unidentified materials or superfluous information will not be accepted.
3. All submittals shall be reviewed by the Contractor and stamped with his approval prior to submitting to the Architect. Contractor shall indicate in writing any deviation in submittals from requirement of Contract Documents.
4. Forward all submittals to the Architect, together, at one (1) time. Individual or incomplete submittals will not be acceptable. Only one (1) request for substitution will be considered on each item of materials or equipment.
5. Wherever catalog numbers and specific brands or trade names, not preceded by the designation "equal to", or followed by the designations "or equal", "or accepted equal", or "or approved equal", are mentioned in these Specifications or Drawings, no substitutions will be accepted.
6. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment. The words "as specified" will not be sufficient identification.
7. Identify each submittal item by reference to Specification Section paragraph in which the item is specified or Drawing and Detail number.
8. Organize submittals in the same sequence as they appear in Specification Sections, article, or paragraphs.
9. Shop Drawings shall show physical arrangement, construction details, finishes, materials used in fabrication, provisions for conduit entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, and weight. Reuse of the Contract Drawings as Shop Drawings will not be acceptable.
    a. Specifically show, by drawn detail or note, that equipment complies with each specified requirements of the Contract Documents.
    b. Drawings shall be to scale and dimensioned (except wiring diagrams need not be to scale) and may be prepared by a vendor but shall be submitted as instruments of Contractor, thoroughly checked, and stamped by Contractor before submission to Architect for review.
    c. Catalog cuts and published material may be included to supplement scale drawings.
10. Internal wiring diagrams of equipment shall show wiring as actually furnished for this project, with all optional items clearly identified as included or excluded. Clearly identify external wiring connections. Identify and obliterate superfluous material.
11. External system wiring diagrams shall show wiring as actually installed, connected, and identified for this project. Include identification of cables, cable conductors, terminals in terminal cabinets, and connections to the identified external wiring connection points on equipment. Prepare Drawings on twenty-four inches (24") by thirty-six inches (36") minimum sheets bearing title block of equipment manufacturer, manufacturer's local engineering distributor, or Contractor, prepared to accepted drafting standards, and bearing Contractor's approved stamp.
12. Acceptance of a substitute is not to be considered a release from the Specifications. Correct any deficiencies in an item, even though approved, at Contractor's expense.
13. Be responsible for installation of approved substitution. Make any changes required for installation of approved substituted equipment at no increase in Contract Sum.

B. Operating and Maintenance Instructions and Materials:
    1. Subsequent to final completion and testing operations, part of the Work of this Division shall be responsibility for instructing the Owner's authorized representatives in operation, adjustment, and maintenance of electrical plant. Submit three (3) copies of certificate, signed by Owner's representatives, attesting to there having been instructed.

2. Before Owner's personnel assume operation of systems, submit three (3) bound sets of Operating and Maintenance Instructions, Manuals, and Parts Lists on the electrical plant and its component parts, including all major equipment and that which requires or for which manufacturer recommends maintenance in a specified manner. Provide names, addresses and telephone numbers of source of supply for parts.

1.6 PROJECT RECORD DOCUMENTS:

A. Upon completion of Work, furnish Architect with complete sets of reproducible plans upon which shall be shown all Work installed under Contract. Drawings shall include actual locations of outlets, conduit, and wire sizing as well as routing and revised panelboard schedules.

B. All symbols and designations used in preparing Record Drawings shall match those used in Contract Drawings.

C. Maintain an up to date set of electrical drawings during the course of construction.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Identify materials and equipment delivered to site to permit check against materials list and Shop Drawings.

B. Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in Contract Sum.

1.8 PROJECT EXAMINATION AND CONDITIONS:

A. Examine project; verify dimensions and locations against Drawings and become informed of all conditions under which Work is to be done before submitting proposals.

B. Information shown relative to services is based upon available records and data but shall be regarded as approximate only. Make deviations found necessary to conform with actual locations and conditions with no increase in Contract Sum. Verify locations and elevation of utilities prior to commencement of excavation for new underground installations.

C. Exercise extreme care in excavating near existing utilities to avoid any damage thereto; be responsible for any damage caused by such operations.

1.9 DRAWINGS AND COORDINATION WITH OTHER WORK:

A. Drawings:

1. For purposes of clarity and legibility, Drawings are essentially diagrammatic to the extent that many offsets, bends, special fittings, and the exact locations of items are not shown, unless specifically dimensioned.
2. Exact routing of wiring and locations of outlets, panels, and other items, shall be governed by structural conditions, and materials and equipment already in place. Use data in the Contract Documents. In addition, the Architect reserves the right, at no increase in Contract Sum, to make any reasonable change in locations of exposed electrical items, to group them into orderly relationships and/or increase their utility. Verify the Architect's requirements in this regard prior to roughing-in.
3. Dimensions, locations of doors, partitions and similar physical features shall be taken from Architectural Drawings and verified at the site as part of the Work of this Division. Consult the Architectural Drawings for exact location of outlets to center with architectural features, panels, and similar items, at the approximate locations shown on the Electrical Drawings.
4. Drawings indicate, generally, routes of all branch circuits. All runs to panels are indicated as starting from nearest outlet, pointing to direction of panel. Continue all such circuits, conduits to panel as though routes were indicated in their entirety.

B. Coordination:

1. Work out all "tight" conditions involving Work of this Division and Work of other Divisions in advance of installation. Provide additional Work necessary to overcome "tight" conditions, at no increase in Contract Sum.

2. Differences of disputes concerning coordination, interference or extent of Work between Divisions shall be decided by General Contractor. His decision, if consistent with Contract Document requirements, shall be final.
3. Provide adequate working space around electrical equipment in compliance with all applicable codes.
4. Coordinate electrical interface of mechanical equipment with the Work of Division 22 & 23.
5. Provide templates, information, and instructions for Work of other Divisions to properly locate holes and openings to be cut or provided for Electrical Work.
6. Size all feeders (conduit and wiring), motor starters, overload protection and circuit breakers to suit horsepower of motors or wattages of equipment furnished as part of the Work of the various Sections of the Specifications. In no case shall feeders and branch circuits (conduit and wiring) and circuit breakers be of smaller capacities or sizes than those shown or specified.
7. Schedule of Work - Refer to Section on Work Sequence.
8. Make every effort to keep existing electrical circuits, including telephone, public address, fire alarm, power, and other electrical services, in operation. Where power outages are unavoidable, schedule such outages with the Owner to occur at such times as to cause the least disruption of normal facility functions.

C. Equipment Rough-In:

1. Rough-in locations shown on Electrical Drawings for equipment furnished by the Owner and for equipment furnished under other Divisions are approximate only. Obtain exact rough-in locations from the following sources:
   a. From Shop Drawings for Contractor-furnished and installed equipment.
   b. From the Architect for Owner-furnished, Contractor-installed equipment.
   c. From the Architect for existing equipment where such equipment is relocated as part of the Work of this Contract.
2. Verify electrical characteristics of equipment before starting rough-in.
3. Unless otherwise shown or specified, equipment which requires electrical connection shall be installed as part of the Work of the Division in which specified. Internal components shall be wired to a single point with wiring in raceway direct connection (hardwired) to building electrical system or internal wiring and connections with cord and plug for receptacle connection to building wiring.
4. Unless otherwise shown or specified, provide direct raceway and conductor connections from building wiring system to equipment terminals for direct connected equipment which is Contractor-furnished and Contractor-installed, Owner-furnished, and Contractor-installed, and for existing equipment relocated by the Contractor.
5. Insert plug in receptacle for cord-connected equipment which is Contractor-furnished and Contractor-installed, Owner-furnished, and Contractor-installed and for existing equipment relocated by the Contractor. Provide new cord and plug if required on Owner-furnished and Contractor-installed equipment.
6. Provide disconnect switches, flush type in finished spaces, where shown or required by Codes for direct-connected equipment.
7. Disconnect existing equipment from building electrical system, including internal wiring required for relocation and reconnection at new location.

1.10 GUARANTEE:

A. Provide guarantee in accordance with and in form required under Division 1. Repair or replace as may be necessary any defective work, material, or part with no increase in Contract Sum including repair or replacement of other Work, furnishing, equipment or premises caused by such repair or replacement of defective work.

1. Where other guarantee periods or requirements are called for in other sections of the contract documents, they shall take precedence over the requirements of Division 1.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Identify materials and equipment by manufacturer's name and nameplate data. Remove unidentified materials and equipment from site.

B. Equipment specified by manufacturer's number shall include all accessories, controls, and other components, listed in catalog as standard with equipment. Furnish optional or additional accessories as specified. All materials shall be UL labeled and in accordance with NEMA Standards.

C. Where no specific make of material or equipment is mentioned, any high-quality product of a reputable manufacturer may be used, provided it conforms to requirements of system and meets with Architect's acceptance.

D. Conflicts between Plans and Specifications, exclusive of the General Conditions of the Contract, the most stringent and higher quality requirement shall govern.

E. If the Contract Documents are not complete as to any detail such as accessories or hardware, of a required construction system or with regard to manner of installing of parts, materials, or equipment, but there exists an accepted trade standard for good and workmanlike construction, such detail or accessories shall be deemed to have been implicitly required by the Contract Documents in accordance with such standard.

F. Equipment and material damaged during transportation, installation, or operation will be considered as totally damaged. Replace with new. Variance from this will be permitted only with written acceptance.

G. Provide an authorized representative to constantly supervise the Work of this Division and to check all materials prior to installation for conformance with the Contract Documents.

H. Do not use equipment exceeding dimensions indicated for equipment, or arrangements that reduce required clearances, or exceed specified maximum dimensions.

2.2 FLASH PROTECTION

A. Electrical equipment including switchboards, panelboards, disconnect switches, etc. which are likely to require examination, adjustment or servicing while energized shall be field marked to warn of potential electric arch flash hazards per CEC Article 110. 16.. Marking shall be a pre-printed label which references NFPA 70E.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Manufacturer's Directions: Follow manufacturer's directions where manufacturers of articles used furnish directions covering points not specified or shown.

B. Equipment: Accurately set and level, neatly place support and anchor properly.

C. Assemble together all equipment which requires assembling including Contractor-supplied bussing, internal wire connections where required; connect all incoming conduit, cable, and wires properly; and adjust and make ready for service electrical equipment and material required by this Contract.

D. All Work shall be done in orderly, workmanlike manner in accordance with NECA Standard of Installation and present neat appearing installation when completed.

E. Provide concrete foundations or pads for floor mounted electrical equipment were indicated on the drawings.

1. Install minimum 4” high concrete pads or as indicated. Other pad dimensions shall be as required to accommodate the equipment installed.
2. Use 3,000 PSI concrete.

3. Reinforce with 6” x 6” 10GA wire mesh with short dowels into floor at 12” on center around perimeter.
4. Chamfer top edges ¾.”
5. Make all faces smooth.
6. Set anchor bolts for equipment.
7. Coordinate the size of all pads, the location of all anchor bolts, ant the location of all vibration isolators.

3.2 NORMAL CONTINGENCIES:

A. Protection: In performance of Work, protect existing facility and protect Work of other Sections as well as Work of this Section from damage.

1. Existing conduits which are required to be extended, altered, or reconnected shall be accomplished as shown or as directed. Existence of any wires, conduits, or other facilities are shown in a general way only. Determine existence, location, and condition on site.
2. Where existing conduits which are shown to be revised or which will be essential to functioning of particular system are cut or exposed due to construction changes, new connections shall be made in most expeditious manner as directed or shown. Where wiring is involved, new wires shall be "pulled-in" between nearest available accessible reused outlets. In all cases where new wires are required, shown, or specified to be installed in existing conduits, if same cannot be installed, new conduits shall be provided therefore as directed.
3. Existing switchboards, motor control centers, and panelboards which are required to be extended, altered, or modified under the Work of this Division shall be provided with new sections, bus extensions, and all necessary hardware for a complete and operating system.
4. Attention is called to the fact that all new conduit, wiring, and apparatus shown or specified shall be connected to existing systems so as to function as complete units.
5. All conduits, electrical apparatus, and similar items, in place and not shown or specified to be reused or which will not be essential to functioning of various systems when Work is completed, shall be removed. No existing material shall be reinstalled or reused, unless shown or specified. Concealed conduits which are not shown or specified to be reused and become exposed due to construction changes shall be removed to nearest available accessible reused outlets.

3.3 PERFORMANCE:

A. Sleeves, Chases, and Concrete Inserts:

1. This Division shall provide, to cause no delay, all required sleeves, chases, concrete inserts, anchor bolts, and similar items before concrete is placed, and be responsible for correct location and installation of same.
2. Sleeves and chases are prohibited in structural members, except were shown or as otherwise approved in writing.

B. Cutting and Patching:

1. Do all cutting and patching, including structural reinforcing, necessary for the Work of this Division.
2. No reinforcing steel or pre-stressed tendons may be cut within concrete floors without prior approval. All new cores or drilled holes shall be a minimum of 1 ½” clear of existing reinforcing. Concrete slabs must be scanned to determine the location of all reinforcing steel prior to coring, anchorage, drilling or any other modifications.
3. Do no cutting or patching without prior approval. Repair damage done by cutting and patching equal to original condition, in Architect's opinion.

C. Provide metal backing plates, anchor plates, and similar items that are required for anchorage for the Work of this Section; securely weld or bolt to metal framing. Wood blocking or backing will not be permitted in combination with metal framing.

3.4 TESTING AND ADJUSTING:

A. Furnish all labor and test equipment required for the Work of this Division. Testing work is defined as that work necessary to establish that equipment has been properly assembled, connected, and checked to verify that intent and purpose of the drawings, specifications, manufacturer's instruction manuals, and directions of Architect have been accomplished in satisfactory manner.

B. Provide field tests to verify component compliance with Specifications, including but not limited to adjusting, calibrating, and setting circuit breakers, relays, timers, etc.

C. After completion of testing and adjustment, operate the different systems and equipment under normal working conditions and show specified performance. If, in the opinion of the Architect, performance of equipment or systems is not in accordance with Contract Document or submitted data, alter, or replace equipment at no increase in Contract Sum.

D. Do not allow or cause any Work installed hereunder to be covered up or enclosed before it has been inspected and accepted. Should any Work be enclosed or covered up before it has been approved, uncover such Work, and after it has been inspected and approved, make all repairs necessary to restore Work of Others to condition in which it was found at time of cutting, all at no increase in Contract Sum.

E. At completion of Work provide written certification that all Systems are functioning properly without defects.

3.5 CLEANING AND PAINTING:

A. Properly prepare Work of this Division to be finish painted as part of the Work of Painting Section.

B. Refinish Work supplied with final finish as part of the Work of this Division if damaged as part of the Work of this Division to satisfaction of Architect.

C. Thoroughly clean interiors of switchboards and motor control centers. After other Work is accomplished, clean exposed conduit, panels (interiors and exteriors), fixtures, and equipment, and leave in condition satisfactory to Architect.

D. Clean out and remove from site all surplus materials and debris resulting from this Work, including surplus excavated materials.

3.6 SALVAGE MATERIAL AND EQUIPMENT:

A. Where remodel or demolition work is to be accomplished under this Contract, all removed materials and equipment which in the opinion of the Owner are salvable shall remain the property of the Owner. Such salvaged materials and equipment shall be delivered to the Owner on the premises as directed and shall be neatly piled or stored and protected from damage.

B. All materials considered to be scrap and not salvable shall be removed from the premises and disposed of by the Contractor.

END OF SECTION

Section 26 05 03
EQUIPMENT WIRING CONNECTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes electrical connections to equipment.

B. Related Sections:

1. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
2. Section 26 05 33 - Raceway and Boxes for Electrical Systems.

1.2 REFERENCES

A. National Electrical Manufacturers Association:

1. NEMA WD 1 - General Requirements for Wiring Devices.
2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

A. Product Data: Submit wiring device manufacturer’s catalog information showing dimensions, configurations, and construction.

B. Manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations, sizes, and configurations of equipment connections.

1.5 COORDINATION

A. Obtain and review shop drawings, product data, manufacturer’s wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

B. Determine connection locations and requirements.

C. Sequence rough-in of electrical connections to coordinate with installation of equipment.

D. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 - PRODUCTS

2.1 CORD AND PLUGS

A. Attachment Plug Construction: Conform to NEMA WD 1.

B. Configuration: NEMA WD 6; match receptacle configuration at outlet furnished for equipment.

C. Cord Construction: Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.

D. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify equipment is ready for electrical connection, for wiring, and to be energized.

3.2 INSTALLATION

A. Make electrical connections.

B. Make conduit connections to equipment using flexible conduit. Use liquid tight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Install receptacle outlet to accommodate connection with attachment plug.

E. Install cord and cap for field-supplied attachment plug.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

3.3 ADJUSTING

A. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION

Section 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes building wire and cable; direct burial cable; service entrance cable; armored cable; metal clad cable; and wiring connectors and connections.

B. Related Sections:

1. Section 26 05 53 - Identification for Electrical Systems: Product requirements for wire identification.

1.2 REFERENCES

A. International Electrical Testing Association:

1. ANSI/NETA ATS – 2017 Acceptance Testing Specifications for Electrical Power Equipment and Systems.

B. NECA (National Electrical Contractors Association) - Standard of Installation.

C. ANSI/NFPA 70 – National Electrical Code (NEC).

D. Part 3, Title 24, - California Electrical Code (CEC).

E. Underwriters Laboratories, Inc. (UL).

1. UL-83, UL-44 – Thermoplastic-Insulated Wire and Cables.
2. UL-1569 – Metal Clad Cable.

1.3 SYSTEM DESCRIPTION

A. Product Requirements: Provide products as follows:

1. Solid or Stranded conductor for feeders and branch circuits 10 AWG and smaller.
2. Stranded conductors for control circuits.
3. Conductor not smaller than 12 AWG for power and lighting circuits.
4. Conductor not smaller than 16 AWG for control circuits.
5. 10 AWG conductors for 20 amperes, 120-volt branch circuit home runs longer than 100 feet.
6. 10 AWG conductors for 20 amperes, 277-volt branch circuit home runs longer than 200 feet.

B. Wiring Methods: Provide the following wiring methods:

1. Concealed Dry Interior Locations: Use only building wire, Type THHN/THWN-2, XHHW-2 insulation, in raceway, armored cable or metal clad cable.
2. Exposed Dry Interior Locations: Use only building wire Type THHN/THWN-2 XHHW-2 insulation, in raceway.
3. Exterior Locations: Use only building wire Type THHN/THWN-2, XHHW-2 insulation, in raceway.
4. Underground Locations: Use only building wire Type THHN/THWN-2, XHHW-2 insulation, in raceway.

1.4 DESIGN REQUIREMENTS

A. Conductor sizes are based on copper.

1.5 SUBMITTALS

A. Product Data: Submit for building wire and each cable assembly type.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of components and circuits.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.8 FIELD MEASUREMENTS

A. Verify field measurements are as indicated on Drawings.

1.9 COORDINATION

A. Where wire and cable destination are indicated and routing is not shown, determine routing and lengths required.

B. Determine required separation between wire, cable, and other work. Determine cable routing to avoid interference with other work.

C. Wire and cable routing indicated is approximate unless dimensioned.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

A. Manufacturers:

1. Southwire
2. Essex Group Inc.
3. General Cable Co.
4. Approved equal.

B. Product Description: Single conductor insulated wire.

C. Conductor: Copper.

2.2 METAL CLAD CABLE

A. Conductor: #12 AWG Copper.

1. Ground: Internal insulated green copper
2. Neutral: Separate neutral per each phase conductor with identifying color strip.
3. Insulation Voltage Rating: 600 volts.
4. Insulation Temperature Rating: 75- or 90-degrees C.
5. Insulation Material: Thermoplastic.
6. Armor Material: Steel
7. Fittings: Steel or malleable iron squeeze connectors with insulated throat.

2.3 PLASTIC TAPE:

A. Black 7 mil thick general purpose electrical tape, Scotch 33 plus or equal.

2.4 HEAT SHRINK TUBING

A. Black medium/heavy dual wall adhesive flexible Polyolefin tubing, 3M or equal.

2.5 INSULATING RESIN:

A. Use two-part liquid epoxy resin with resin and catalyst in premeasured, sealed mixing pouch. Scotchcast 4 or equivalent.

2.6 REDUCING ADAPTERS:

A. Burndy, Thomas, and Betts or approved equal.

2.7 WIRING CONNECTORS

A. Bolted pressure connectors: Cast bronze compression bolts designed for parallel taps, tees, crosses, or end-to-end connections.

B. Compression connectors: One-piece tin-plated copper high-compression type lugs for installation with hand or hydraulically operated crimping tools and dies.

C. Insulated spring wire connectors: multi-part construction incorporating a steel spring enclosed with a color-coded outer thermoplastic shell.

D. Insulated spring wire wet/damp location spring wire connectors: multi-part construction incorporating a steel spring enclosed with a color-coded outer thermoplastic shell pre-filled with silicone base to protect against moisture and corrosion.

E. Compression type termination lugs: Tin plated copper high-compression type lugs for installation with hand or hydraulically operated crimping tools and dies. Provide 2-hole lugs for size #4/0 AWG and larger wire were terminated to bus bars.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify interior of building has been protected from weather.

B. Verify mechanical work likely to damage wire and cable has been completed.

C. Verify raceway installation is complete and supported.

3.2 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.3 INSTALLATION

A. Route wire and cable to meet Project conditions.

B. Neatly train and lace wiring inside boxes, equipment, and panelboards.

C. Identify and color code wire and cable under provisions of Section 26 05 53. Identify each conductor with its circuit number or other designation indicated.

D. Special Techniques--Building Wire in Raceway:

1. Pull conductors into raceway at same time.
2. Install building wire 4 AWG and larger with pulling equipment.

E. Special Techniques - Cable:

1. Protect exposed cable from damage.
2. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure. Do not rest cable on ceiling panels.
3. Use suitable cable fittings and connectors.
4. Armored Cable or Metal Clad Cable is not permitted for homerun use. Extend cable from junction/wireway box having branch circuits for the immediate area. Use conduit or electrical metallic tubing for routing branch circuit conductors from junction/wireway box to panelboard.
5. Armored Cable or Metal Clad Cable is not permitted to be routed through rated or non-rated walls.
6. AC or MC cable is not permitted for Critical or Life Safety branch circuit wiring except were permitted by the CEC.

F. Special Techniques - Wiring Connections:

1. Clean conductor surfaces before installing lugs and connectors.
2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
4. Provide heat shrink tubing to completely cover compression connections.
5. Install solderless tool applied pressure or split bolt connectors and lugs for copper conductor splices and taps, 8 AWG and larger.
6. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
7. Encapsulate below grade splices at outlet, pull and junction boxes with specified insulating resin kits. Make all splices watertight.
8. Install waterproof wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller in outdoor or wet locations.
9. Where oversized cables are used to accommodate voltage drop, whether a single or parallel feeder, provide appropriate reducing adapter and conductors for termination.

10. Secure conductors to circuit breakers, lugs and ground/neutral bus terminations utilizing a torque screwdriver or wrench to the manufacturer's specified torque values.
11. Terminate aluminum conductors with tin-plated, aluminum-bodied compression connectors only. Fill with antioxidant compound before installing conductor.
12. Install suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.

3.4 WIRE COLOR

A. General

1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
    a. Black and red for single phase circuits at 120/240 volts.
    b. Black, red, and blue for circuits at 120/208 volts single or three phase.
    c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices, and boxes. Colors are as follows:
    a. Black and red for single phase circuits at 120/240 volts.
    b. Black, red, and blue for circuits at 120/208 volts single or three phase.
    c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.

B. Branch Circuits: Shared neutral conductors for multiple circuits are not permitted. Provide a separate neutral conductor for each phase conductor.

C. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.

D. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.

E. Feeder Circuit Conductors: Uniquely color code each phase.

F. Ground Conductors:

1. For 6 AWG and smaller: Green.
2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.5 FIELD QUALITY CONTROL

A. Provide visual and mechanical inspection in accordance with NETA ATS-2017, 7.3.2A.

B. Subject feeder cables sized #2 AWG and larger, rated 600 volts AC to insulation resistance test in accordance with NETA ATS-2017, 7.3.2B and CEC 110.3(A)(4).

C. Do not megger any cables after connecting to any equipment, unless specifically directed to do so by Architect.

D. Provide written test results and a final report of electrical tests per NETA ATS-2017 5.4 to Architect.

END OF SECTION

Section 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rod electrodes.
2. Wire.
3. Grounding well components.
4. Mechanical connectors.
5. Exothermic connections.

1.2 REFERENCES

A. Institute of Electrical and Electronics Engineers:

1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.

B. International Electrical Testing Association:

1. ANSI/NETA ATS – 2017 Acceptance Testing Specifications for Electrical Power Equipment and Systems.

C. Part 3, Title 24, - California Electrical Code (CEC).

D. NFPA 99 - Standard for Health Care Facilities.

1.3 SYSTEM DESCRIPTION

A. Grounding systems use the following elements as grounding electrodes:

1. Metal underground water pipe.
2. Metal building frame.
3. Concrete-encased electrode.
4. Rod electrode.

1.4 DESIGN REQUIREMENTS

A. Construct and test grounding systems for access flooring systems on conductive floors accordance with IEEE 1100.

1.5 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 10 ohms maximum.

1.6 SUBMITTALS

A. Product Data: Submit data on grounding electrodes and connections.

B. Test Reports: Indicate overall resistance to ground.

1.7 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of components and grounding electrodes.

1.8 QUALITY ASSURANCE

A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

B. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

C. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

1.11 COORDINATION

A. Complete grounding and bonding of building reinforcing steel prior concrete placement.

PART 2 - PRODUCTS

2.1 ROD ELECTRODES

A. Product Description:

1. Material: Copper-clad steel.
2. Diameter: 3/4-inch min.
3. Length: 10 feet.

B. Connector: Connector for exothermic welded connection.

2.2 WIRE

A. Material: Stranded copper.

B. Foundation Electrodes: 4 AWG.

C. Grounding Electrode Conductor: Copper conductor insulated if in conduit or above grade exposed, bare if direct buried.

D. Bonding Conductor: Copper conductor insulated.

2.3 GROUNDING WELL COMPONENTS

A. Well Pipe: 8 inches NPS by 24 inches long concrete pipe with belled end.

B. Well Cover: Cast iron with legend "GROUND" embossed on cover.

2.4 MECHANICAL CONNECTORS

A. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

2.5 EXOTHERMIC CONNECTIONS

A. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify final backfill and compaction has been completed before driving rod electrodes.

3.2 PREPARATION

A. Remove paint, rust, mill oils and surface contaminants at connection points.

3.3 INSTALLATION

A. Install rod electrodes at locations as indicated on Drawings. Install additional rod electrodes to achieve specified resistance to ground.

B. Install grounding and bonding conductors concealed from view.

C. Install grounding well pipe with cover at each rod location. Install well pipe top flush with finished grade.

D. Install 4 AWG bare copper wire in foundation footing

E. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.

F. Install continuous grounding using underground cold-water system and building steel as grounding electrode. Where water piping is not available, install artificial station ground by means of driven rods or buried electrodes.

G. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.

H. Install branch circuits feeding isolated ground receptacles with separate insulated grounding conductor, connected only at isolated ground receptacle, ground terminals, and at ground bus of serving panel.

I. Size grounding conductors in accordance with CEC or as indicated on drawings. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground conduits as necessary by means of grounding bushings on terminations at panelboards and switchboards to grounding bus.

J. Permanently attach equipment and grounding conductors prior to energizing equipment.

3.4 FIELD QUALITY CONTROL

A. Provide visual and mechanical inspection in accordance with NETA ATS, 7.13A.

B. Perform electrical tests in accordance with NETA ATS, 7.13B.

C. Perform ground resistance testing in accordance with IEEE 142.

D. Perform continuity testing in accordance with IEEE 142.

E. Provide written test results of grounding system and submit to Architect.

END OF SECTION

Section 26 05 33
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

B. Related Sections:

1. Section 26 05 03 - Equipment Wiring Connections.
2. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
3. Section 26 05 29 - Hangers and Supports for Electrical Systems.
4. Section 26 05 53 - Identification for Electrical Systems.
5. Section 26 27 26 - Wiring Devices.
6. Section 33 71 19 – Underground Conduit System

C. American National Standards Institute:

1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.

D. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
5. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
6. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

E. Part 3, Title 24, - California Electrical Code (CEC).

1.2 SYSTEM DESCRIPTION

A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.

B. Underground outside Foundation Wall: Use plastic coated conduit or nonmetallic conduit. Terminate with coated rigid steel elbows and short length of PVC coated rigid steel conduit out of concrete or soil. Use cast metal boxes or nonmetallic handhole.

C. Outdoor Locations, Above Grade: Provide rigid steel conduit, intermediate metal conduit, and electrical metallic tubing with compression type fittings. Provide cast metal or nonmetallic outlet, pull, and junction boxes.

D. Below Slab on Grade: Use Schedule 40 nonmetallic conduit. Terminate with PVC coated rigid steel elbows and short length of PVC coated rigid steel conduit out of concrete.

E. Wet and Damp Locations: Provide rigid steel conduit, electrical metallic tubing with compression type fittings, Schedule 40 nonmetallic conduit. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.

F. Concealed Dry Locations: Provide rigid steel conduit, intermediate metal conduit or electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes were shown on drawings.

G. Exposed Interior Dry Locations: Use rigid steel conduit or intermediate metal conduit below eight feet or where subject to damage. Use rigid steel conduit, intermediate metal conduit, or electrical metallic tubing above eight feet or in electrical, mechanical or telecommunication

rooms. Use sheet-metal or cast metal boxes. Use flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.3 DESIGN REQUIREMENTS

A. Minimum Raceway Size:

1. 1/2 inch.
2. 3/4 inch. for homeruns.
3. 1 inch outside foundation line.
4. 1 1/4” inch for communication system outlets.

1.4 SUBMITTALS

A. Product Data: Submit for the following:

1. Metallic conduit.
2. Electrical metallic tubing.
3. Flexible metal conduit.
4. Liquid tight flexible metal conduit.
5. Flexible nonmetallic conduit.
6. Raceway fittings.
7. Conduit bodies.
8. Wireway.
9. Pull and junction boxes.
10. Handholes.

B. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents:

1. Record actual routing of site conduits and conduits larger than 2 inches.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

1.7 COORDINATION

A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

B. Coordinate Work of this Division and Work of other Divisions in advance of installation. Provide additional Work to overcome tight conditions at no increase in Contract Sum.

C. Coordinate installation of outlet boxes for equipment specified in other divisions.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

A. Rigid Steel Conduit: ANSI C80.1.

B. Intermediate Metal Conduit (IMC): Rigid steel.

C. Fittings: NEMA FB 1. Fittings shall be steel or malleable iron with threaded fittings. Use insulated metallic bushings with lug where ground connections are required. Use plastic bushing for non-bonding applications.

D. Conduit Bodies: Bodies connected to rigid steel or intermediate conduit shall be malleable iron. Provide matching gasketed cover with at least two corrosion resistant screws.

2.2 PVC COATED METAL CONDUIT

A. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.

B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

A. Product Description: Interlocked steel construction.

B. Fittings: NEMA FB 1; steel iron squeeze type with insulated throat.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Product Description: Interlocked steel construction with PVC jacket.

B. Fittings: NEMA FB 1; steel fitting with insulated throat.

2.5 ELECTRICAL METALLIC TUBING (EMT)

A. Product Description: ANSI C80.3; galvanized tubing.

B. Fittings: NEMA FB 1; steel set screw or compression couplings and connectors. Box connectors shall have with insulated throat.

C. Conduit Bodies: Provide types of shapes, and sizes to suit individual applications. Bodies shall be aluminum or malleable iron.

2.6 NONMETALLIC CONDUIT

A. Product Description: NEMA TC 2; Schedule 40 PVC. Schedule 80 PVC in traffic rated areas.

B. Fittings: NEMA TC 3.

2.7 WIREWAY

A. Product Description: General purpose or Raintight type wireway.

B. Finish: Rust inhibiting primer coating with gray enamel finish.

2.8 OUTLET BOXES

A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.

1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2-inch male fixture studs where required.
2. Boxes for shall be 1-1/2 inch deep by 4-inch square minimum.
3. Boxes for telecommunications outlets shall be 2-1/2 inch deep by 4 11/16-inch square minimum. Provide 1-gang device ring.
4. Concrete Ceiling Boxes: Concrete type.

B. Cast Boxes: NEMA FB 1, Type FD, cast feralloy. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

C. Wall Plates for Finished Areas: As specified in Section 26 27 26.

D. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.9 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Concrete composite Handholes:

1. Die-molded, concrete composite hand holes:
2. Cable Entrance: Pre-cut cable entrance at center bottom of each side.
3. Extension: 12” reinforced concrete below box.
4. Cover: Concrete composite cover with nonskid finish. Covers shall be marked “ELECTRIC,” “SIGNAL,” “GROUND’ or as indicated on drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 INSTALLATION

A. Ground and bond raceway and boxes in accordance with Section 26 05 26.

B. Fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.

C. Identify raceway and boxes in accordance with Section 26 05 53.

D. Arrange raceway and boxes to maintain headroom and present neat appearance.

E. Maintain minimum 12” clearance from top of suspended ceiling to bottom of conduits where possible.

F. Electrical wiring, conduits and boxes may not be installed within 1 ½” of metal deck roofs.

3.3 INSTALLATION - RACEWAY

A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

B. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

C. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 26 05 29; provide space on each for 25 percent additional raceways.

D. Provide flexible conduit connections of short length to equipment subject to vibration and all motors; twenty-four inches maximum.

E. Provide flexible conduit for connections to light fixtures above ceilings; six foot maximum.

F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports

G. Do not attach raceway to ceiling support wires or other piping systems.

H. Do not route flexible conduit through rated or non-rated walls.

I. Construct wireway supports from steel channel specified in Section 26 05 29.

J. Route exposed raceway parallel and perpendicular to walls.

K. Route raceway installed above accessible ceilings parallel and perpendicular to walls.

L. Tops of underground conduits inside foundation lines shall be not less than 4 inches below building floor slab for branch circuits. Feeders and large signal conduits (2" and greater) at not less than 18 inches.

M. Maintain clearance between raceway and piping for maintenance purposes.

N. Maintain 2-inch clearance between raceway running perpendicular to piping with temperatures exceeding 104 degrees F.

O. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.

P. Cut conduit square using saw or pipe cutter; de-burr cut ends.

Q. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.

R. Install conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

S. Install no more than equivalent of four 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2-inch size.

T. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.

U. Install fittings to accommodate expansion and deflection where raceway crosses seismic, control or expansion joints.

V. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

W. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

X. Close ends and unused openings in wireway.

Y. All conduits installed on this project for Telecommunications Cabling where any portion of the conduit is below slab on grade, shall be cleaned, and swabbed dry by the installing contractor. In pathways installed within the building, the Telecommunications Contractor shall not place Telecommunications Cabling into slab on grade conduits containing water. Wet conditions will immediately be reported to the General Contractor or Project Manager upon discovery and cleaned prior to cable installation.

3.4 INSTALLATION - BOXES

A. Boxes for Concealed Conduits:

1. Flush mounted.
2. Provide raised covers for boxes to suit the wall or ceiling, construction, and finish.

B. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings.

C. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.

D. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.

E. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

F. In Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 24 inches from ceiling access panel or from removable recessed luminaire.

G. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

H. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation.

I. Provide acoustical rated moldable putty pads for all boxes located in acoustic rated walls.

J. Provide fire rated moldable putty pads for all boxes located in fire rated walls.

K. Secure flush mounting box to interior wall and partition studs with screws, not nails. Use box support bracket with far side support leg. Accurately position to allow for surface finish thickness.

L. Install stamped steel bridges to fasten flush mounting outlet box between studs.

M. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

N. Install adjustable steel channel fasteners for hung ceiling outlet box.

O. Do not fasten boxes to ceiling support wires or other piping systems.

P. Support boxes independently of conduit.

Q. Install gang box where more than one device is mounted together. Do not use sectional box.

R. Install gang box with plaster ring for single device outlets.

S. Boxes located below eight feet in exposed interior dry locations shall be one piece drawn steel or cast type.

3.5 INSTALLATION CONCRETE COMPOSITE HANDHOLES

A. Install boxes flush with finished grade or surface material.

B. Provide hold down bolts for all covers.

C. Provide minimum 12” depth of crushed rock or pea gravel below boxes for drainage. Ground bond steel cover plate with insulated green grounding conductor.

3.6 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements.

B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified in other Sections.

C. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.

D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.7 ADJUSTING

A. Adjust flush-mounting outlets to make front flush with finished wall material.

B. Install knockout closures in unused openings in boxes.

3.8 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Clean exposed surfaces and restore finish.

END OF SECTION

Section 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Nameplates.
2. Labels.
3. Engraved cover plates.
4. Wire markers.
5. Underground Warning Tape.

1.2 SUBMITTALS

A. Product Data:

1. Submit manufacturer’s catalog literature for each product required.
2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.

1.3 QUALITY ASSURANCE

A. Provide material supplied by a manufacturer producing identification systems

B. Comply with OSHA, NFPA or local authority identification requirements for electrical systems.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Install labels or nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 - PRODUCTS

2.1 NAMEPLATES

A. Product Description: Laminated three-layer plastic with engraved white letters on contrasting background color.

1. Provide minimum letter height as follows:
   a. For Panelboards, Distribution boards, and Switchboards: 1/2-inch letters to identify equipment designation. Use 1/4-inch letters to identify voltage, phase, and wires.
   b. For Individual Circuit Breakers in Distribution panelboards, Distribution boards, Switchboards, Switchgear and Motor Control Centers use 3/8-inch letters to identify equipment designation. Use 1/8-inch letters to identify all other.
   c. For Individual mounted Circuit Breakers, Disconnect Switches, Enclosed Switches, and motor Starters use 3/8-inch letters to identify equipment designation. Use 1/8-inch letters to identify all others.
   d. For Transformers use 1/2-inch letters to identify equipment designation. Use 1/4-inch letters to identify primary and secondary voltages, primary disconnect location, and other specified data.
   e. For equipment cabinets, terminal cabinets, control panels and other cabinet enclosed apparatus use 3/8-inch letters to identify equipment designation.

B. Minimum nameplate thickness: 1/16 inch for signs up to 20 square inches, or 8 inches in length; 1/8 inch thick for larger sizes. Furnish with pre-punched holes for mechanical fasteners.

2.2 BRASS TAGS

A. Metal tags with die-stamped legend, punched for fastener. 2-inch diameter, 19 gauge.

2.3 LABELS

A. Labels: Thermal transfer laminated adhesive tape, with 1/8-inch black letters on clear tape cartridge.

2.4 WIRE MARKERS

A. Description: Self-adhering, pre-printed, machine printable or write-on, self-laminating vinyl wrap around strips. Inscribe blank markers using the printer or pen recommended by the manufacturer for this purpose.

B. Legend:

1. Power and Lighting Circuits: Branch circuit or feeder number as indicated on Drawings.
2. Control Circuits: Control wire number as indicated on shop drawings.

2.5 CONDUCTOR PHASE MARKERS

A. Colored vinyl plastic electrical tape, 3/4 inch wide, for identification of phase conductors.

2.6 UNDERGROUND WARNING TAPE

A. Description: 6-inch-wide plastic tape, detectable type, colored yellow or red with suitable warning legend describing buried electrical lines.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 INSTALLATION

A. Install identifying devices after completion of painting.

B. Nameplate Installation:

1. Install nameplate parallel to equipment lines.
2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners.
4. Secure nameplate to equipment front using rivets.
   a. Provide color coded nameplates as applicable, with the following information:
      1) Equipment or device designation.
      2) Amperage, KVA or horsepower rating, where applicable.
      3) Voltage or signal system name.
      4) "Served from" identification.
      5) Miscellaneous information as shown in "Examples".
      6) Examples:

(a) Panels: 2EH1
225A
277/480V, 3PH, 4W
Served From: 2EHD1

(b) Transformers: ETX-1
150KVA
480V - 120/208V, 3PH, 4W
Served From: EHD1
Load Served: EL1

(c) Motor Control Centers:

Main Nameplate:	Each Compartment
MCC-NH1	EF-1
600A Main Bus	20 HP
480V, 3PH, 3W	Switch Size: 100A
Served From: HDD1A-2	Starter Size: 1

(d) Disconnects or Individual Motor Starters.
EF-1
20HP
480V, 3PH,3W
Served From: MCCNH-1

(e) Signal: STB-3
Public Address System
Served From: STBM

C. Nameplates for power system distribution equipment and devices are to be colored as follows: (Unless otherwise noted)
   1. 120/208 VAC Normal - Black with white letters
D. Label Installation:
   1. Install label parallel to equipment lines.
   2. Install label for identification of individual control device stations, receptacles, and switches.
   3. Locate the top of label 1/2 inch below the top edge of cover plates.
   4. Install label for multi-outlet assembly receptacles.
   5. Install labels for permanent adhesion.
E. Inscribed Device Cover plate:
   1. General: Lettering type shall be Helvetica, 12 point or 1/8" high. Color of characters shall be black. Locate the top of the inscription 1/2" below the top edge of the cover plate. Inscription shall be centered and square with cover plate.
   2. Provide inscribed cover plates for devices as outlined below:
      a. Receptacles and switches.
      b. Outlets in surface raceways.
      c. Multi-ganged (four or more) switch arrangement.
      d. Special purpose switches, i.e., projection screens, shades, exhaust fans, etc.
F. Wire Marker Installation:
   1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
   2. Provide colored plastic phase tape in half-lapped turns for a distance of 3 inches from terminal points and in boxes where splices or taps are made.
G. Junction box identification:
   1. Color code and identify all junction boxes located above suspended ceilings and below ceilings in non-public areas.
   2. Use finish paint suitable for use on metal surfaces.
   3. Boxes shall be identified with permanent felt tip marker on cover indicating panel and circuit numbers. Paint junction box covers using the color coding listed below.
      a. 208/120 Volt System: Blue.
      b. Fire Alarm System: Red.

3.3 Underground WARNING Tape:

A. Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches below finished grade, directly above buried conduit, raceway, or cable.

3.4 BRASS Tags:

A. Provide brass tags for all feeder cables in underground vaults and pull boxes.
B. Provide brass tags for empty conduits in underground vaults, pull boxes and stubs.

3.5 WARNING, CAUTION, AND INSTRUCTION SIGNS

A. Provide warning, caution or instruction signs where required by OSHA, where indicated, or where reasonably required to assure safe operation and maintenance of electrical systems.
   1. Install engraved plastic-laminated instruction signs with approved legend where instructions or explanations are needed for system of equipment operation
   2. Provide polyester film self-adhesive signs for indoor/outdoor equipment and door warning. Use rigid polyethylene non-adhesive signs where adhesives will not work; for example, installing on a metal fence. Provide sign color and marking that meets OSHA regulations. For example, DANGER (red background with white letters), HIGH VOLTAGE (white with black letters.
      a. Use 2 by 4-inch signs for small equipment or enclosure doors.
      b. Use 7 by 10 inch or 10 by 14-inch signs for large equipment or enclosure doors.

B. Emergency Operating Signs: Install engraved laminate signs with white letters on red background with minimum 3/8-inch-high lettering for emergency instructions on power transfer, load shedding, or other emergency operations.

3.6 Firestopping

A. Firestopping shall be labeled at each location where installed, on each side of the penetrated fire barrier, and within 12 in. of the firestopping material.

END OF SECTION

Section 26 24 13
SWITCHBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes main and distribution switchboards.

B. Related Sections:

1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
2. Section 26 05 53 - Identification for Electrical Systems.
3. Section 33 71 73 - Electrical Utility Services: Utility metering equipment.

1.2 REFERENCES

A. American National Standards Institute:

1. ANSI C12.1 - Code for Electricity Metering.
2. ANSI C39.1 - Requirements, Electrical Analog Indicating Instruments.

B. Institute of Electrical and Electronics Engineers:

1. IEEE C57.13 - Standard Requirements for Instrument Transformers.
2. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

C. National Electrical Manufacturers Association:

1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
2. NEMA PB 2 - Deadfront Distribution Switchboards.
3. NEMA PB 2.1 - General Instructions for Proper Handling, Installation, Operation, and Maintenance of Deadfront Distribution Switchboards Rated 600 Volts or Less.

D. International Electrical Testing Association:

1. ANSI/NETA ATS 2017 - Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 SUBMITTALS

A. Shop Drawings: Indicate front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars for each phase, neutral, and ground; and switchboard instrument details.

B. Product Data: Submit electrical characteristics including voltage, frame size and trip ratings, fault current withstand ratings, and time-current curves of equipment and components.

C. Seismic Qualification: Submit manufacturer’s certificate of seismic compliance in accordance with the American Society of Civil Engineers ASCE/SEI 7-10 and the California Building Code.

D. Test Reports: Indicate results of factory production and field tests.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations, configurations, and ratings of switchboards and their components on single line diagrams and plan layouts.

B. Operation and Maintenance Data: Submit spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. The equipment and major components shall be suitable for and certified by actual seismic testing to meet all applicable seismic requirements of the California Building Code.

C. The following minimum mounting and installation guidelines shall be met, unless specifically modified by the above referenced standards.

1. The Contractor shall provide equipment anchorage details, coordinated with the equipment mounting provision, prepared, and stamped by a licensed civil engineer in the state. Mounting recommendations shall be provided by the manufacturer based upon the above criteria to verify the seismic design of the equipment.
2. The equipment manufacturer shall certify that the equipment can withstand, that is, function following the seismic event, including both vertical and lateral required response spectra as specified in above codes.
3. The equipment manufacturer shall document the requirements necessary for proper seismic mounting of the equipment. Seismic qualification shall be considered achieved when the capability of the equipment, meets or exceeds the specified response spectra.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver in 48-inch maximum width shipping splits, individually wrapped for protection, and mounted on shipping skids.

B. Accept switchboards on site. Inspect for damage.

C. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.

D. Handle in accordance with NEMA PB 2.1. Lift only with lugs provided. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Conform to NEMA PB 2 service conditions during and after installation of switchboards.

1.8 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.9 SEQUENCING

A. Sequence Work to avoid interferences with building finishes and installation of other products.

1.10 MAINTENANCE MATERIALS

A. Furnish two of each key.

PART 2 - PRODUCTS

2.1 DISTRIBUTION SWITCHBOARDS

A. Manufacturers:

1. GE Electrical.
2. Siemens.
3. Square D.
4. Eaton Electrical/Cutler-Hammer

B. Product Description: NEMA PB 2, enclosed switchboard with electrical ratings and configurations as indicated on Drawings.

C. Series Ratings: Series rated equipment is not allowed.

D. Device Mounting:

1. Main Section: Individually mounted.
2. Distribution Section: Individually mounted and Panel mounted.

E. Bus:

1. Material: Copper with tin plating, standard size.
2. Connections: Bolted, accessible from front for maintenance.
3. Insulation: Fully insulate load side bus bars.

F. Ground Bus: Extend length of switchboard.

G. Line and Load Terminations: Accessible from [front only] [rear] of switchboard, suitable for conductor materials and sizes as indicated on Drawings.

H. Utility Metering Compartment: Furnish metering transformer compartment for Utility Company's use, in accordance with Utility Company requirements.

I. Pull Section: Size as indicated on Drawings. Width, depth, and height to match switchboard. Arrange as indicated on Drawings.

J. Pull Box: Removable top and sides, same construction as switchboard, size as indicated on Drawings. Furnish insulating, fire-resistive bottom with separate openings for each circuit to pass into switchboard.

K. Future Provisions: Fully equip spaces for future devices with bussing and bus connections, insulated and braced for short circuit currents. Furnish continuous current rating as indicated on Drawings.

L. Enclosure: Type 3R Outdoor Rated

M. Align sections at front.

N. Switchboard Height 90” excluding floor sills, lifting members and pull boxes.

O. Finish: Manufacturer's standard light gray enamel over external surfaces. Coat internal surfaces with minimum one coat corrosion-resisting paint, or plate with cadmium or zinc.

P. Energy Reducing Maintenance Switch: Furnish an Energy Reduction Maintenance Switching System with a local status indicator for all distribution switchboards that have circuit breakers that are rated or can be adjusted to 1200 amps or higher.

2.2 MOLDED CASE CIRCUIT BREAKER

A. Manufacturers:

1. GE Electrical.
2. Siemens.
3. Square D.
4. Eaton Electrical/Cutler-Hammer

B. Product Description: NEMA AB 1, molded-case circuit breaker.

C. Field-Adjustable Trip Circuit Breaker: Circuit breakers with frame sizes 250 amperes and larger shall have a field adjustable variable magnetic trip element.

D. Current Limiting Circuit Breaker: Circuit breaker indicated as current limiting have automatically resetting current limiting elements in each pole. Let-through Current and Energy: Less than permitted for same size Class RK-5 fuse.

E. Solid-State Circuit Breaker: Electronic sensing, timing, and tripping circuits for adjustable current settings.

1. As a minimum, the trip unit shall have the following protective functions:
   a. Adjustable long-time pickup.
   b. Adjustable long-time delay.
   c. Adjustable instantaneous pickup.
   d. Adjustable short time pickup.
   e. Adjustable short time delay.
2. Main circuit breakers shall be rated for 80 percent continuous duty.
3. Distribution circuit breakers shall be rated for 80 percent continuous duty.

F. Current Limiter: Designed for application with molded case circuit breaker.

1. Coordinate limiter size with trip rating of circuit breaker to prevent nuisance tripping and to achieve interrupting current rating specified for circuit breaker.
2. Interlocks trip circuit breaker and prevent closing circuit breaker when limiter compartment cover is removed or when one or more limiter is not in place or has operated.

G. Accessories: Conform to NEMA AB 1.

1. Handle Lock: Provisions for padlocking.

2.3 SURGE PROTECTION DEVICES

A. Where indicated on the drawings, provide the SPD with the following Electrical Requirements

1. Unit Operating Voltage – Refer to drawings for operating voltage and unit configuration.
2. Maximum Continuous Operating Voltage (MCOV) – The MCOV shall not be less than 115% of the nominal system operating voltage.
3. The suppression system shall incorporate thermally protected metal-oxide varistors (MOVs) as the core surge suppression component for the service entrance and all other distribution levels. The system shall not utilize silicon avalanche diodes, selenium cells, air gaps, or other components that may crowbar the system voltage leading to system upset or create any environmental hazards.
4. Protection Modes – The SPD must protect all modes of the electrical system being utilized. The required protection modes are indicated by bullets in the following table:

	Protection Modes			
Configuration	L-N	L-G	L-L	N-G
Wye	●	●	●	●
Delta	N/A	●	●	N/A
Single Split Phase	●	●	●	●
High Leg Delta	●	●	●	●

5. Nominal Discharge Current (In) – All SPDs applied to the distribution system shall have a 20kA in rating regardless of their SPD Type (includes Types 1 and 2) or operating voltage. SPDs having an in less than 20kA shall be rejected.
6. ANSI/UL 1449 4th Edition Voltage Protection Rating (VPR) – The maximum ANSI/UL 1449 4th Edition VPR for the device shall not exceed the following:

MODES	208Y/120	480Y/277	600Y/347
L-N; L-G; N-G	700	1200	1500
L-L	1200	2000	3000

B. SPD Design

1. Maintenance Free Design – The SPD shall be maintenance free and shall not require any user intervention throughout its life. SPDs containing items such as replaceable modules, replaceable fuses, or replaceable batteries shall not be accepted. SPDs requiring any maintenance of any sort such as periodic tightening of connections shall not be accepted. SPDs requiring user intervention to test the unit via a diagnostic test kit or similar device shall not be accepted.
2. Balanced Suppression Platform – The surge current shall be equally distributed to all MOV components to ensure equal stressing and maximum performance. The surge suppression platform must provide equal impedance paths to each matched MOV. Designs incorporating replaceable SPD modules shall not be accepted.
3. Electrical Noise Filter – Each unit shall include a high-performance EMI/RFI noise rejection filter. Noise attenuation for electric line noise shall be up to 50 dB from 10 kHz to 100 MHz using the MIL-STD-220A insertion loss test method. Products unable able to meet this specification shall not be accepted.
4. Internal Connections – No plug-in component modules or printed circuit boards shall be used as surge current conductors. All internal components shall be soldered, hardwired with connections utilizing low impedance conductors.
5. Monitoring Diagnostics – Each SPD shall provide the following integral monitoring options:
   a. Protection Status Indicators - Each unit shall have a green / red solid-state indicator light that reports the status of the protection on each phase.

1) For wye configured units, the indicator lights must report the status of all protection elements and circuitry in the L-N and L-G modes. Wye configured units shall also contain an additional green / red solid-state indicator light that reports the status of the protection elements and circuitry in the N-G mode. SPDs that indicate only the status of the L-N and L-G modes shall not be accepted.
2) The absence of a green light and the presence of a red light shall indicate that damage has occurred on the respective phase or mode. All protection status indicators must indicate the actual status of the protection on each phase or mode. If power is removed from any one phase, the indicator lights must continue to indicate the status of the protection on all other phases and protection modes. Diagnostics packages that simply indicate whether power is present on a particular phase shall not be accepted.

b. Remote Status Monitor – The SPD must include Form C dry contacts (one NO and one NC) for remote annunciation of its status. Both the NO and NC contacts shall change state under any fault condition.
c. Audible Alarm and Silence Button – The SPD shall contain an audible alarm that will be activated under any fault condition. There shall also be an audible alarm silence button used to silence the audible alarm after it has been activated.
d. Surge Counter – The SPD shall be equipped with an LCD display that indicates to the user how many surges have occurred at the location. The surge counter shall trigger each time a surge event with a peak current magnitude of a minimum of 50 ± 20A occurs. A reset pushbutton shall also be standard, allowing the surge counter to be zeroed. The reset button shall contain a mechanism to prevent accidental resetting of the counter via a single, short-duration button press. In order to prevent accidental resetting, the surge counter reset button shall be depressed for a minimum of 2 seconds in order to clear the surge count total.
1) The ongoing surge count shall be stored in non-volatile memory. If power to the SPD is completely interrupted, the ongoing count indicated on the surge counter's display prior to the interruption shall be stored in non-volatile memory and displayed after power is restored. The surge counter's memory shall not require a backup battery in order to achieve this functionality.

6. Overcurrent Protection
a. The unit shall contain thermally protected MOVs. These thermally protected MOVs shall have a thermal protection element packaged together with the MOV in order to achieve overcurrent protection of the MOV. The thermal protection element shall disconnect the MOV(s) from the system in a fail-safe manner should a condition occur, that would cause them to enter a thermal runaway condition.
7. Fully Integrated Component Design – All of the SPD's components and diagnostics shall be contained within one discrete assembly. SPDs or individual SPD modules that must be ganged together in order to achieve higher surge current ratings or other functionality shall not be accepted.
8. Safety Requirements
a. The SPD shall minimize potential arc flash hazards by containing no user serviceable / replaceable parts and shall be maintenance free. SPDs containing items such as replaceable modules, replaceable fuses, or replaceable batteries

shall not be accepted. SPDs requiring any maintenance of any sort such as periodic tightening of connections shall not be accepted. SPDs requiring user intervention to test the unit via a diagnostic test kit or similar device shall not be accepted.

b. SPDs designed to interface with the electrical assembly via conductors shall require no user contact with the inside of the unit. Such units shall have any required conductors be factory installed.

C. System Application

1. The SPD applications covered under this section shall be tested and demonstrate suitability for application within ANSI/IEEE C62.41 Category C, and B environments.

D. Surge Current Capacity – The minimum surge current capacity the device is capable of withstanding shall be as shown in the following table:

Minimum surge current capacity based on ANSI / IEEE C62.41 location category			
CATEGORY	Application	Per Phase	Per Mode
C	Service Entrance Locations (Switchboards, Switchgear, MCC, Main Entrance)	250 kA	125 kA
B	High Exposure Roof Top Locations (Distribution Panelboards)	160 kA	80 kA

E. SPD Type – All SPDs installed on the load side of the service entrance disconnect shall be Type 1 or Type 2 SPDs.

2.4 DIGITAL POWER METERING MODULE

A. Metering Equipment: Provide a multi-function, high accuracy digital power metering instrumentation module equipped with an LCD display. The power metering module shall provide simultaneous measurements for current, voltage, power factor and power parameters. Power meter shall be equipped with a communications port for connection to customer's energy-management network.

B. Meter shall include the following power functions:

1. Instantaneous kW demand.
2. Historical peak demand.
3. Resettable kWh.
4. kWh per rate period.

2.5 ACCESSORIES

A. Furnish thermostatically controlled electric heaters in each section, sized to prevent condensation under expected weather conditions at Project site. Furnish terminals for separate connection of heater power circuit. Voltage Rating: 120 volts.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify surface is suitable for switchboard installation.

3.2 INSTALLATION

A. Install in accordance with NEMA PB 2.1.

B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.

C. Install engraved plastic nameplates in accordance with Section 26 05 53.

D. Install breaker circuit directory.

E. Ground and bond switchboards in accordance with Section 26 05 26.

3.3 FIELD QUALITY CONTROL

A. Provide visual and mechanical inspection in accordance with NETA ATS, 7.1A.

B. Perform electrical tests in accordance with NETA ATS, 7.1.2B.

C. Provide circuit breaker visual and mechanical inspection in accordance with NETA ATS, 7.6.1.1A.

D. Perform circuit breaker electrical tests in accordance with NETA ATS, 7.6.1.1B.

3.4 ADJUSTING

A. Adjust operating mechanisms for free mechanical movement.

B. Tighten bolted bus connections.

3.5 CLEANING

A. Touch up scratched or marred surfaces to match original finish.

3.6 RECORD DRAWING

A. Post ‘As Built’ record drawing copy of the power distribution One Line Diagram in the vicinity of the main switchboard, framed, and mounted under plexiglass. Submit to Architect/Engineer for approval before fabrication.

END OF SECTION

Section 26 24 16
PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes distribution and branch circuit panelboards.

B. Related Sections:

1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
2. Section 26 05 53 - Identification for Electrical Systems.

1.2 REFERENCES

A. Institute of Electrical and Electronics Engineers:

1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

B. National Electrical Manufacturers Association:

1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
3. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
4. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
5. NEMA PB 1 - Panelboards.
6. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.

C. International Electrical Testing Association:

1. ANSI/NETA ATS 2017 - Acceptance Testing Specifications for Electrical Power Equipment and Systems.

D. Underwriters Laboratories Inc.:

1. UL 67 - Safety for Panelboards.
2. UL 1449 – Surge Protection Devices.

1.3 SUBMITTALS

A. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

B. Product Data: Submit catalog data showing specified features of standard products.

C. Seismic Qualification: Submit manufacturer’s certificate of seismic compliance in accordance with the American Society of Civil Engineers ASCE/SEI 7-05 and the California Building Code.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.

B. Operation and Maintenance Data: Submit spare parts listing; source of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. The equipment and major components shall be suitable for and certified by actual seismic testing to meet all applicable seismic requirements of the California Building Code.

C. The following minimum mounting and installation guidelines shall be met, unless specifically modified by the above referenced standards.

1. The Contractor shall provide equipment anchorage details, coordinated with the equipment mounting provision, prepared, and stamped by a licensed civil engineer in the state. Mounting recommendations shall be provided by the manufacturer based upon the above criteria to verify the seismic design of the equipment.
2. The equipment manufacturer shall certify that the equipment can withstand, that is, function following the seismic event, including both vertical and lateral required response spectra as specified in above codes.
3. The equipment manufacturer shall document the requirements necessary for proper seismic mounting of the equipment. Seismic qualification shall be considered achieved when the capability of the equipment, meets or exceeds the specified response spectra.

1.6 MAINTENANCE MATERIALS

A. Furnish two of each panelboard key. Panelboards keyed alike.

PART 2 - PRODUCTS

2.1 DISTRIBUTION PANELBOARDS

A. Manufacturers:
1. GE Electrical.
2. Siemens.
3. Square D.
4. Eaton Electrical/Cutler-Hammer

B. Product Description: NEMA PB 1, circuit breaker type

C. Panelboard Bus: Copper current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.

D. Minimum fully rated short circuit rating: as indicated on drawings.

E. Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Circuit breakers with frame sizes 250 amperes and larger shall have a field adjustable variable magnetic trip element.

F. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated on Drawings.

G. Enclosure: NEMA PB 1, Type 1 cabinet box.

H. Cabinet Front: Surface door-in-door type, fastened with concealed trim clamps, hinged door with flush lock, and metal directory frame. Finished in manufacturer's standard gray enamel.

2.2 BRANCH CIRCUIT PANELBOARDS

A. Manufacturers:
1. GE Electrical.
2. Siemens.
3. Square D.
4. Eaton Electrical/Cutler-Hammer

B. Product Description: NEMA PB1, circuit breaker type, lighting, and appliance branch circuit panelboard.

C. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.

D. Minimum fully rated short circuit rating: as indicated on drawings.

E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, Class A ground fault interrupter circuit breakers as indicated on Drawings. Circuit breakers with frame sizes 250 amperes and larger shall have a field adjustable variable magnetic trip element.
1. Circuit breaker handle locks shall be provided for all circuits that supply emergency egress lights, energy management and control system (EMCS) panels and fire alarm panels.

F. Enclosure: NEMA PB 1, Type 1.

G. Cabinet Box: 6 inches deep, 20 inches wide.

H. Cabinet Front: Flush or Surface mounted cabinet front with door-in-door concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finish in manufacturer's standard gray enamel.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1.

B. Install panelboards plumb.

C. Install recessed panelboards flush with wall finishes.

D. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.

E. Install filler plates for unused spaces in panelboards.

F. Provide 6 by 8-inch minimum typed circuit directory with clear plastic covering inside panel door for each branch circuit panelboard. Contractor shall clearly identify locations and specific purpose of circuits.

G. Install engraved plastic nameplates in accordance with Section 26 05 53.

H. Install spare conduits out of each recessed panelboard to accessible location above ceiling. Minimum spare conduits: 3 empty 1 inch. Identify each as SPARE.

I. Ground and bond panelboard enclosure according to Section 26 05 26. Connect equipment ground bars of panels in accordance with NFPA 70.

3.2 FIELD QUALITY CONTROL

A. Perform visual and mechanical inspections listed in NETA ATS, Section 7.6.1.1A.

B. Perform tests listed in NETA ATS, Section 7.6.1.1B.

END OF SECTION

Section 26 27 26
WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes wall switches; wall dimmers; receptacles; multioutlet assembly; and device plates and decorative box covers.

B. Related Sections:

1. Section 26 05 33 - Raceway and Boxes for Electrical Systems: Outlet boxes for wiring devices.

1.2 REFERENCES

A. National Electrical Manufacturers Association:

1. NEMA WD 1 - General Requirements for Wiring Devices.
2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's catalog information showing dimensions, colors, and configurations.

B. All switches, receptacles and device plates throughout project shall be from the same manufacturer unless otherwise specified.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years’ experience.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

A. Manufacturers:

1. Pass & Seymour
2. Hubbell
3. Leviton
4. Cooper
5. Approved equal

B. Product Description: Specification Grade, NEMA WD 1, Heavy-Duty, AC only general-use snap switch.

C. Body and Handle: White thermoplastic with toggle handle.

D. Wiring: Back and side wired. Back wiring with clamp type terminals suitable for stranded or solid wire.

E. Indicator Light: Separate pilot strap; red color lens.

F. Locator Light: Lighted handle type switch; green color handle.

G. Ratings:

1. Voltage: 120-277 volts, AC.
2. Current: 20 amperes.

2.2 LED WALL DIMMERS

A. MANUFACTURERS

1. Leviton
2. Lutron
3. Approved equal

B. Product Description: UL listed to control dimmable self ballasted LED and incandescent loads.

C. Body and Handle: White plastic with linear slide.

D. Ratings:
   1. Voltage: 120 volts, AC.
   2. Ratings: 150 watts LED, 600 watts incandescent.

2.3 RECEPTACLES

A. Manufacturers:
   1. Pass & Seymour
   2. Hubbell
   3. Leviton
   4. Cooper
   5. Approved equal

B. Product Description: Commercial Grade, NEMA WD 1, Heavy-duty general use receptacle. Grounding system shall be all brass and integral to the wrap around mounting strap. Combination head brass grounding screw. Brass alloy triple wipe contacts shall grip both sides of plug prongs.

C. Device Body: White thermoplastic face.

D. Wiring: Back and side wired. Back wiring with clamp type terminals suitable for stranded or solid wire.

E. Convenience Receptacle: Duplex type 5-20.

F. Dedicated Receptacle: Duplex type 5-20

G. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

H. Weather Resistant Receptacle: Convenience receptacle listed for use in wet or damp locations. Provide “WR” designation on face of outlet.

I. Special Purpose Receptacles: Type and rating and number of poles indicated or required for the anticipated purpose.

J. Automatically Controlled Receptacles: Provide engraved controlled receptacle marking symbol and the word “CONTROLLED” on the face of 15A and 20A 125V receptacles to meet CEC requirements.

2.4 WALL PLATES

A. Decorative Cover Plate: White thermoplastic

B. Mounting Screws: Stainless steel, painted head to match plate finish.

C. Surface cover plate in dry locations: Galvanized steel. Four-inch square raised 1/2” for surface mounted switches and receptacles.

D. Weatherproof Damp Location Cover Plate: Gasketed cast metal cover plate with hinged and gasketed device cover.

E. Weatherproof Wet Location Cover Plate: Extended polycarbonate hinged cover for use when attachment plug is inserted.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify outlet boxes are installed at proper height.

B. Verify wall openings are neatly cut and completely covered by wall plates.

C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

A. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install devices plumb and level.
B. Mounting heights shown shall be measured from finished floor to the center of the outlet box.
C. Install switches with OFF position down.
D. Install receptacles with grounding pole on bottom.
E. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.
F. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
G. Terminate ground wire at device where ground wire is provided within the raceway system.
H. Carefully strip thermoplastic wire to length and make-up terminal connection as recommended by the device manufacturer.
I. Secure device to outlet box with proper screws.
J. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
K. Install weather resistant receptacle with GFCI protection in wet or damp locations.

3.4 Labels and Inscriptions:

A. Identify receptacle cover plate with panel and branch circuit number (for example L2A-3). Engrave and fill with 1/8” high black letters.

3.5 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 26 05 33 to obtain mounting heights as indicated on drawings.

3.6 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.
B. Operate each wall switch with circuit energized and verify proper operation.
C. Verify each receptacle device is energized.
D. Test each receptacle device for proper polarity and grounding.
E. Test each GFCI receptacle device for proper operation.

3.7 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.8 CLEANING

A. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

Section 26 28 19
ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fusible and non-fusible switches.

1.2 REFERENCES

A. National Electrical Manufacturers Association:
   1. NEMA FU 1 - Low Voltage Cartridge Fuses.
   2. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).

B. International Electrical Testing Association:
   1. ANSI/NETA ATS - 2017Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 SUBMITTALS

A. Product Data: Submit switch ratings and enclosure dimensions.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of enclosed switches and ratings of installed fuses.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCH ASSEMBLIES

A. Manufacturers:
   1. GE Electrical.
   2. Siemens.
   3. Square D.
   4. Eaton Electrical/Cutler-Hammer

B. Product Description: NEMA KS 1, Type GD enclosed load interrupter knife switch. Handle lockable in OFF position.

C. Fuse clips: Designed to accommodate NEMA FU 1, Class R fuses.

D. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from [steel finished with manufacturer's standard gray enamel.
   1. Interior Dry Locations: Type 1.
   2. Exterior Locations: Type 3R.

E. Furnish switches with entirely copper current carrying parts.

2.2 NONFUSIBLE SWITCH ASSEMBLIES

A. Manufacturers:
   1. GE Electrical.
   2. Siemens.
   3. Square D.
   4. Eaton Electrical/Cutler-Hammer

B. Product Description: NEMA KS 1, Type GD enclosed load interrupter knife switch. Handle lockable in OFF position.

C. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from [steel finished with manufacturer's standard gray enamel.

1. Interior Dry Locations: Type 1.
2. Exterior Locations: Type 3R.

D. Furnish switches with entirely copper current carrying parts.

2.3 SWITCH RATINGS

A. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.

B. Short Circuit Current Rating:

1. Non-Fused Switches: UL listed for 10,000 rms symmetrical amperes.
2. Fused Switches: UL listed for 10,000 rms symmetrical amperes when used with or protected by Class H or K fuses (30-600 ampere), 200,000 rms symmetrical amperes when used with or protected by Class R or Class J fuses (30-600 ampere switches employing appropriate fuse rejection schemes).

PART 3 - EXECUTION

3.1 EXISTING WORK

A. Disconnect and remove abandoned enclosed switches.

B. Maintain access to existing enclosed switches and other installations remaining active and requiring access. Modify installation or provide access panel.

C. Clean and repair existing enclosed switches to remain or to be reinstalled.

3.2 INSTALLATION

A. Install enclosed switches plumb. Provide supports in accordance with Section 26 05 29.

B. Install fuses for fusible disconnect switches. Refer to Section 26 28 13 for product requirements.

C. Install engraved plastic nameplates in accordance with Section 26 05 53.

D. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

3.3 FIELD QUALITY CONTROL

A. Provide visual and mechanical inspections per NETA ATS 7.5.1.1.A.
B. Perform tests per NETA ATS 7.5.1.1.B

END OF SECTION

Section 26 51 00
INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes interior luminaires, lamps, ballasts, and accessories.

B. Related Sections:

1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
2. Section 26 05 33 - Raceway and Boxes for Electrical Systems.

1.2 REFERENCES

A. Underwriters Laboratory

1. UL 8750-09 - Light Emitting Diode (LED) Light Sources for Use in Lighting Products.

1.3 SUBMITTALS

A. Shop Drawings: Indicate dimensions and components for each luminaire not standard product of manufacturer.

B. Product Data: Submit dimensions, ratings, and performance data.

C. Provide lighting fixtures complete with lamps, completely wired, controlled, and securely attached to supports.

D. Contractor shall provide entire lighting specification (including fixture catalog cuts and sketches) for each specified manufacturer with complete information about the fixtures they will supply.

E. Type of fixtures shall be as indicated alphanumerically and as specified.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.5 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 INTERIOR LUMINAIRES

A. Product Description: Complete interior luminaire assemblies, with features, options, and accessories as scheduled.

2.2 LED LIGHT FIXTURES

A. General:

1. LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on the drawings, and as specified.
2. LED light fixtures shall be Reduction of Hazardous Substances (RoHS)-compliant.
3. LED drivers shall include the following features unless otherwise indicated:
   a. Minimum efficiency: 85% at full load.
   b. Minimum Operating Ambient Temperature: -20˚ C. (-4˚ F.)
   c. Input Voltage: 120 - 277V (±10%) at 60 Hz.
   d. Integral short circuit, open circuit, and overload protection.
   e. Power Factor: ≥ 0.90.
   f. Total Harmonic Distortion: ≤ 20%.
   g. Comply with FCC 47 CFR Part 15.
   h. LED driver shall have Class A sound rating.

4. LED modules shall include the following features unless otherwise indicated:
   a. Comply with IES LM-79 and LM-80 requirements.

b. Minimum CRI 90 and color temperature 3000˚ K unless otherwise specified in LIGHTING FIXTURE SCHEDULE.
c. Minimum Rated Life: 50,000 hours per IES L70.
d. Light output lumens as indicated in the LIGHTING FIXTURE SCHEDULE.

5. LED lamps shall be capable of continuous dimming, without flicker or noise, from 10-100 percent.

B. LED Downlights:

1. Housing, LED driver, and LED module shall be products of the same manufacturer.

C. LED Troffers:

1. LED drivers, modules, and reflector shall be accessible, serviceable, and replaceable from below the ceiling.
2. Housing, LED driver, and LED module shall be products of the same manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide mounting accessories as required for ceiling construction. Fixture catalog numbers do not necessarily denote specific mounting accessories for type of ceiling in which a fixture may be installed.

B. Provide adequate and sturdy support for each lighting fixture. Verify weight and mounting method of fixtures and furnish and install suitable supports. Fixture mounting assemblies shall comply with local seismic codes and regulations.

C. Install suspended luminaires using pendants supported from swivel hangers. Install pendant length required to suspend luminaire at indicated height.

D. Support luminaires independent of ceiling framing.

E. Locate recessed ceiling luminaires as indicated on Reflected Ceiling Plan.

F. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prevent movement.

G. Exposed Grid Ceilings: Support surface-mounted luminaires on grid ceiling directly from building structure.

H. Install recessed luminaires to permit removal from below.

I. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.

J. Install clips to secure recessed grid-supported luminaires in place.

K. Install wall-mounted luminaires at height as indicated on Drawings.

L. Install accessories furnished with each luminaire.

M. Connect luminaires to branch circuit outlets provided under Section 26 05 33 using flexible conduit not exceeding 6 feet.

N. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

O. Install specified LED diodes in each luminaire.

P. Lighting fixtures recessed in ceilings which have a fire resistive rating of 1 hour or more shall be enclosed in a box which has a fire resistive rating equal to that of the ceiling.

Q. Ground and bond interior luminaires in accordance with Section 26 05 26.

3.2 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.3 ADJUSTING

A. Aim and adjust luminaries as directed.

3.4 CLEANING

A. Remove dirt and debris from enclosures.

B. Clean photometric control surfaces as recommended by manufacturer.

C. Clean finishes and touch up damage.

END OF SECTION

Division 27 -31 - NOT USED

NOT USED

* End Division 30 *

Division 32 - EXTERIOR IMPROVEMENTS

Section 32 12 16
ASPHALT PAVING

PART 1 - GENERAL
1.1 SUMMARY: Provide Asphalt Concrete Paving, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. American Wood Preservers Association (AWPA):
1. AWPA C1: All Timber Products - Preservative Treatment by Pressure Processes.
2. AWPA C2: Wood Preservative Treatment by Pressure Process.
C. State of California, Department of Transportation (CalTrans):
1. Specifications: CalTRANS Standard Specifications.
2. Plans: CalTRANS Standard Plans.
1.3 SUBMITTALS:
A. General: Submit product data.
B. Closeout: Submit maintenance data.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. General: Refer to Drawings for specific materials specifications and notes.
B. Base Course: CalTRANS Standard Specifications, Section 26, Class 2 aggregate base; 3/4 inch maximum.
1. Primer: MC-70 per CalTRANS Standard Specifications, Section 93.
2. Asphalt Binder:
a. General: Steam-refined paving asphalt per CalTRANS Standard Specifications, Section 92, Grade AR-4000.
C. Surface Course: Mineral aggregates for Type "B" asphalt concrete, per CalTRANS Standard Specifications, Section 39-2.02, Type B, ½ inch maximum grading.
D. Seal Coat: As shown.
E. Precast Concrete Bumpers:
1. General: Parking Curb manufactured by Jensen Precast, size as shown.
2. Alternate Manufacturers: Comparable products manufactured by Oldcastle Precast, or accepted equal.
F. Pavement-Marking Paint:
1. General: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 3 minutes; formulated specifically for marking traffic lines on asphaltic concrete and portland cement concrete paving.
2. Parking and Traffic Control Markings: Provide reflective materials.
3. Colors: Selected by Architect.
G. Abrasive Grit: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent white aluminum oxide and not less than 25 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.
2.2 MIXES:
A. General: Plant mixed per CalTRANS Standard Specifications, Section 39, Type B, ½ inch maximum grading.
B. Temperature of Asphalt: 275 degrees F minimum; 325 degrees F maximum, when added to aggregate.
C. Temperature of Aggregate: 250 degrees F minimum; 325 degrees F maximum, when asphalt is added.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements:
   1. Base Course: Do not lay during wet weather, on muddy sub-grade, or when atmospheric temperature is below 35 degrees F.
   2. Asphalt Surfacing: Do not apply during wet weather, on wet base course, or when atmospheric temperature is below 50 degrees F.

B. Examination: Examine conditions of work in place before beginning work; report defects.

C. Measurements: Take field measurements; report variance between plan and field dimensions.

D. Preparation of Subgrade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 3/8 inch in 10'-0" from true plane. Compact to not less than 95% of maximum dry density per ASTM D1557, as specified under Section 31 20 10 - EARTHWORK.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Required Thickness after Compaction:
   1. Aggregate Base Course: As shown.
   2. Asphalt Concrete Surface Course: As shown.

C. Asphalt Paving:
   1. Aggregate Base Course: Install per CalTRANS Standard Specifications, Section 26; compact to relative compaction of not less than 95%, ASTM D1557.
   2. Sterilant: Apply per manufacturer's instructions over entire base course area just prior to application of asphalt.
   3. Asphalt Binder: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed. Apply at rate of 0.02 to 0.10 gallons per square yard of surface.
   4. Asphalt Concrete Surface Course:
      a. General: Per CalTRANS Standard Specifications, Section 39-6 except as modified below.
      b. Final Gradation: Smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 95% of maximum theoretical unit weight as determined by California Test Method No. 304. Maximum variation 1/8 inch in 10'-0" when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix.
   5. Seal Coat: Thoroughly clean all surfaces of dust, oil spots and other foreign material. Apply a minimum of 30 days after placement of paving. Mix and apply per manufacturer's instructions. Apply two (2) coats, minimum, at a rate of 30 gallons of material per 1,000 square feet, minimum. Additional applications may be required to provide uniform surface.

D. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. Prime vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Patch existing paving where cut for installation of piping or conduits under Division 22 - PLUMBING and Division 26 - ELECTRICAL.

E. Line Painting: Refer to Section 32 17 23 - PAVEMENT MARKINGS.

F. Bumpers: Install where shown, with steel dowels; do not damage bumpers or asphalt concrete paving.

* * *

Section 32 17 23
PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY: Provide Pavement Markings, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.

B. Americans with Disabilities Act (ADA):

1. General: Americans with Disabilities Act of 1990, ADA - 42 U.S. Code Chapter 126.
2. ADA Standards for Accessible Design: U.S. Department of Justice, 28 CFR Part 36.

C. Master Painters Institute (MPI): Painting Manuals.

D. National Paint and Coatings Association (NPCA): Guide to U.S. Government Paint Specifications.

E. State of California, Department of Transportation (CalTrans): CalTRANS Standard Specifications.

1.3 SUBMITTALS:

A. General: Submit product data and a certificate stating compliance with federal, state and local VOC regulations.

B. Samples:

1. General: Submit manufacturer's standard colors for each surface finishing product specified.

C. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Pavement-Marking Paint:

1. General: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 45 minutes; formulated specifically for marking traffic lines on asphaltic concrete and portland cement concrete paving, in compliance with California Air Resources Board (CARB) and local air quality authorities.
2. Parking and Traffic Control Markings: Provide reflective materials.
3. Colors: Selected by Architect.

B. Abrasive Grit: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent white aluminum oxide and not less than 25 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

2.2 MIXING: Mix paints at the factory; do not alter or reduce materials except as directed by manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements: Do not apply during inclement weather conditions, or when surface temperatures exceed 95 deg F or are under 50 degrees F.

B. Examination: Examine conditions of work in place before beginning work; report defects.

C. Measurements: Take field measurements; report variance between plan and field dimensions.

D. Protection: Protect adjacent surfaces not scheduled for paint finish from damage resulting from painting operations.

E. Surface Preparation: Allow paving to cure for 30 days minimum before pavement marking. Sweep and clean surface to eliminate loose material and dust.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Pavement Marking:

1. General: Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
2. Application:
   a. General: Using proper masking, stencils and mechanical application equipment, apply two (2) coats of paint to clean, dry surfaces to produce pavement markings of dimensions required, to a minimum wet film thickness of 15 mils, with uniform, straight edges.

b. Parking and Traffic Control Markings:
   1. General: Conform to CalTrans Standard Specifications - Chapter 6, Markings, and jurisdictional requirements. Provide minimum of two coats paint.
   2. Traffic Striping: 4 inch line width unless otherwise indicated, with uniform, straight edges without overspray.
   3. Traffic Directional Markings and Accessibility Logo: Provide reflective material in traffic directional markings if required by jurisdictional authority.
   4. Curbs: Paint full vertical face and first 6-inches of horizontal plane at top of curb or combination curb/paving.
   5. Hatching: Provide hatching in parking areas, including accessible parking stalls, as shown or as required.
   6. Standard and Compact Stall Markings: Marking styles and widths as shown.
   7. Accessible Stalls and Path of Travel:
      a.) General: Per CBC.
      b.) Painted Lines and Markings:
         1.) General: 3-inches wide minimum; color No. 15090 per Federal Standard 595B.
         2.) Electric Vehicle Charging: Identify charging capacity.
      c.) Tactile Warning Lines: Per CBC at accessible stalls and path of travel.
      d.) Abrasive Grit: Broadcast uniformly into wet pavement markings rate of 25 pounds per 100 square feet and repaint line.
c. Playground Markings: Provide as shown; colors as selected by the Architect.

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Division 32 - EXTERIOR IMPROVEMENTS

Section 32 12 16
ASPHALT PAVING

PART 1 - GENERAL
1.1 SUMMARY: Provide Asphalt Concrete Paving, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
B. American Wood Preservers Association (AWPA):
1. AWPA C1: All Timber Products - Preservative Treatment by Pressure Processes.
2. AWPA C2: Wood Preservative Treatment by Pressure Process.
C. State of California, Department of Transportation (CalTrans):
1. Specifications: CalTRANS Standard Specifications.
2. Plans: CalTRANS Standard Plans.
1.3 SUBMITTALS:
A. General: Submit product data.
B. Closeout: Submit maintenance data.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. General: Refer to Drawings for specific materials specifications and notes.
B. Base Course: CalTRANS Standard Specifications, Section 26, Class 2 aggregate base; 3/4 inch maximum.
1. Primer: MC-70 per CalTRANS Standard Specifications, Section 93.
2. Asphalt Binder:
a. General: Steam-refined paving asphalt per CalTRANS Standard Specifications, Section 92, Grade AR-4000.
C. Surface Course: Mineral aggregates for Type "B" asphalt concrete, per CalTRANS Standard Specifications, Section 39-2.02, Type B, ½ inch maximum grading.
D. Seal Coat: As shown.
E. Precast Concrete Bumpers:
1. General: Parking Curb manufactured by Jensen Precast, size as shown.
2. Alternate Manufacturers: Comparable products manufactured by Oldcastle Precast, or accepted equal.
F. Pavement-Marking Paint:
1. General: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 3 minutes; formulated specifically for marking traffic lines on asphaltic concrete and portland cement concrete paving.
2. Parking and Traffic Control Markings: Provide reflective materials.
3. Colors: Selected by Architect.
G. Abrasive Grit: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent white aluminum oxide and not less than 25 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.
2.2 MIXES:
A. General: Plant mixed per CalTRANS Standard Specifications, Section 39, Type B, ½ inch maximum grading.
B. Temperature of Asphalt: 275 degrees F minimum; 325 degrees F maximum, when added to aggregate.
C. Temperature of Aggregate: 250 degrees F minimum; 325 degrees F maximum, when asphalt is added.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements:
   1. Base Course: Do not lay during wet weather, on muddy sub-grade, or when atmospheric temperature is below 35 degrees F.
   2. Asphalt Surfacing: Do not apply during wet weather, on wet base course, or when atmospheric temperature is below 50 degrees F.

B. Examination: Examine conditions of work in place before beginning work; report defects.

C. Measurements: Take field measurements; report variance between plan and field dimensions.

D. Preparation of Subgrade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 3/8 inch in 10'-0" from true plane. Compact to not less than 95% of maximum dry density per ASTM D1557, as specified under Section 31 20 10 - EARTHWORK.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Required Thickness after Compaction:
   1. Aggregate Base Course: As shown.
   2. Asphalt Concrete Surface Course: As shown.

C. Asphalt Paving:
   1. Aggregate Base Course: Install per CalTRANS Standard Specifications, Section 26; compact to relative compaction of not less than 95%, ASTM D1557.
   2. Sterilant: Apply per manufacturer's instructions over entire base course area just prior to application of asphalt.
   3. Asphalt Binder: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed. Apply at rate of 0.02 to 0.10 gallons per square yard of surface.
   4. Asphalt Concrete Surface Course:
      a. General: Per CalTRANS Standard Specifications, Section 39-6 except as modified below.
      b. Final Gradation: Smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 95% of maximum theoretical unit weight as determined by California Test Method No. 304. Maximum variation 1/8 inch in 10'-0" when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix.
   5. Seal Coat: Thoroughly clean all surfaces of dust, oil spots and other foreign material. Apply a minimum of 30 days after placement of paving. Mix and apply per manufacturer's instructions. Apply two (2) coats, minimum, at a rate of 30 gallons of material per 1,000 square feet, minimum. Additional applications may be required to provide uniform surface.

D. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. Prime vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Patch existing paving where cut for installation of piping or conduits under Division 22 - PLUMBING and Division 26 - ELECTRICAL.

E. Line Painting: Refer to Section 32 17 23 - PAVEMENT MARKINGS.

F. Bumpers: Install where shown, with steel dowels; do not damage bumpers or asphalt concrete paving.

* * *

Section 32 13 13
CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY: Provide Concrete Paving, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Concrete Institute (ACI):
1. ACI 117: Standard Tolerances for Concrete Construction and Materials.
2. ACI 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
3. ACI 211.2: Recommended Practice for Selecting Proportions for Normal Weight Concrete.
4. ACI 302.1R: Guide for Floor and Slab Construction.
5. ACI 303R: Guide to Cast-in-Place Architectural Concrete Practice.
6. ACI 304R: Guide for Measuring, Mixing, Transporting and Placing Concrete.
7. ACI 305R: Hot Weather Concreting.
8. ACI 306R: Cold Weather Concreting.
9. ACI 308: Standard Practice for Curing Concrete.
10. ACI 347R: Guide to Formwork for Concrete.
11. ACI SP-66: Detailing Manual.

B. The Engineered Wood Association (APA): Standard Grading Rules.

C. American Society for Testing and Materials (ASTM):
1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers standard specifications.
2. ASTM C39: Standard Test Methods for Compressive Strength of Cylindrical Concrete Specimens.
3. ASTM C94: Standard Specifications for Ready-Mixed Concrete.
4. ASTM E329: Standard Specification for Agencies Engaged in Construction Inspection, Testing or Special Inspection.

D. State of California, Department of Transportation (CalTrans): CalTRANS Standard Specifications.

E. Concrete Reinforcing Steel Institute (CRSI): Concrete Reinforcing Steel Institute Manual of Standard Practice.

F. National Institute of Standards and Technology (NIST):
1. PS-1: Construction and Industrial Plywood.
2. PS-20: American Softwood Lumber Standard.

G. National Ready-Mixed Concrete Association (NRMCA): Check List for Certification of Ready Mixed Concrete Production Facilities.

1.3 SUBMITTALS:

A. General: Submit product data, samples of concrete finishes and test reports per CBC.

B. Shop Drawings:
1. Submit manufacture and installation details per ACI 315, including fastenings, for review.
2. Formwork: Design formwork per ACI and CBC requirements.
3. Reinforcing: Indicate bar sizes, spacings, locations and quantities of reinforcing steel and wire fabric; bending and cutting schedules, including supporting and spacing devices and fastenings.
4. Design Mixes: Submit concrete mix designs for review.

C. Placement Records: Keep on job site until completion, and open to inspection, record showing time and date and accurate location of placement of concrete.

D. Certificates:
1. General: Submit certification stating that products used to manufacture concrete delivered to the site meet or exceed the material and testing requirements of these specifications.
2. Reinforcement: Submit mill test and chemical analysis certificates for all reinforcing steel delivered to the site.

1.4 QUALITY ASSURANCE:

A. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience.

B. Testing: Tests by Testing Laboratory appointed by Owner and under directions of Architect; expense of testing borne by Owner; make tests per CBC.

PART 2 - PRODUCTS

2.1 MATERIALS:
- A. Formwork:
  1. General: Refer to Section 03 10 00 - CONCRETE FORMING AND ACCESSORIES.
  2. Expansion Joint Filler Strip Material: ASTM D1751, asphalt-saturated cellulosic fiber.
- B. Reinforcement: Refer to Section 03 20 00 - CONCRETE REINFORCING.
- C. Concrete:
  1. General: Refer to Section 03 30 00 - CAST-IN-PLACE CONCRETE.

2.2 FABRICATION: Fabricate per the CRSI "Manual of Standard Practice"; where specific details are not shown, fabricate per ACI 315.

2.3 MIXES:
- A. Concrete Proportions:
  1. General: Per ACI 211.1 and ACI 301.
  2. Minimum Strength: 2,500 psi per Chapter 19 of CBC.
- B. Mixing of Concrete:
  1. General: Per CBC; mix until there is uniform distribution of material and mass is uniform and homogeneous; mixer must be discharged completely before the mixer is recharged.
  2. Ready-Mix Concrete: Mix and deliver per CBC; furnish batch ticket information.
  3. Job Mixed Concrete:
     a. General: Use batch mixer of approved type, with capacity to handle one or more full sack batches, no split sack batches permitted; furnish batch ticket information. Operate mixer as recommended by manufacturer. Record approximate location of final deposit in structure.
     b. Mixer Capacity of 1 Cubic Yard or less: Mix minimum one and one half (1-1/2) minutes after all materials are in drum.
     c. Mixer Capacity of 1 Cubic Yard or More: Increase mixing time by 15 seconds for each additional 1 cubic yard, after all materials are in drum.
     d. Handling and Mixing of Concrete: Architect may order removal of any equipment which in his opinion is insufficient or in any way unsuitable.

PART 3 - EXECUTION

3.1 PREPARATION:
- A. Environmental Requirements: Per ACI 305R and ACI 306R.
- B. Examination: Examine conditions of work in place before beginning work; report defects. Verify granular sub-base materials have been placed to the depth shown.
- C. Measurements: Take field measurements; report variance between plan and field dimensions.
- D. Protection: Protect finish surfaces adjacent to locations scheduled for placement of concrete.

3.2 INSTALLATION:
- A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
- B. Earthwork: Refer to Section 31 20 10 - EARTHWORK for excavation, sub-base and backfill requirements. Conform to levels and grades shown.
- C. Toxicant Chemicals: Refer to Section 31 31 00 - SOIL TREATMENT; apply under concrete walks, paving and where shown.
- D. Formwork:
  1. General: Refer to Section 03 10 00 - CONCRETE FORMING AND ACCESSORIES.
  2. Expansion Joint Material: Install at 30’-0” on center, maximum.
- E. Reinforcement: Refer to Section 03 20 00 - CONCRETE REINFORCING.
- F. Cast-in-place Concrete:
  1. General: Refer to Section 03 30 00 - CAST-IN-PLACE CONCRETE[03 30 10 - CONCRETE].
  2. Concrete Finishes: Refer to Section 03 35 00 - CONCRETE FINISHING.
     a. General: Uniformly spread, screed and float concrete.
     b. Float: Apply at tile setting beds, where shown.
     c. Contraction Joints: Mark off exposed joints, where indicated, with 1/4 inch radius edging tool. Markings to be clean cut, straight and square with respect to border. Tool edges of exposed expansion and control joints, border edges, and wherever concrete adjoins other material or vertical surfaces.
     d. Trowel: Apply two (2) steel troweling operations at surfaces to receive carpet, resilient materials, thinset tile and where left exposed, finished to achieve burnished surface.

Follow second troweling with light brooming perpendicular to direction of traffic to form non-slip surface.

e. Broom: Apply medium broom finish at exterior walks and stairs, perpendicular to direction of traffic flow; heavy broom finish at ramps.
f. Accessible Routes of Travel:
1. General: Provide concrete paving and concrete finishes along accessible routes of travel at least as slip-resistant as that described as a medium salted finish for slopes of less than 6%, and slip-resistant at slopes of 6% or greater.
2. Slip-Resistive Aggregate: Uniformly spread 25 pounds per 100 square feet of dampened slip-resistive aggregate over surface in not more than two (2) applications. Tamp aggregate flush with, but do not press below surface. Apply float finish. After curing, lightly work surface with a steel wire brush and water to expose aggregate.

3. Curing:
a. General: Refer to ACI 308. Protect concrete from premature drying for minimum five (5) days following pour. Cover and cure with membrane curing or moist sand; upon completion wash clean.
b. Sealer: Apply where shown.
4. Removal of Forms: Five (5) days.
5. Patching: Repair exposed concrete to match surrounding concrete finish as required by the Architect.
6. Protection: After placement, finishing and completion of required repairs, protect exposed corners, edges, and surfaces of concrete from damage, including staining and contamination during remainder of construction period.

3.3 FIELD QUALITY CONTROL:
A. General: Per CBC, Section 1905.6; agency selected and paid for by Owner.
B. Field Testing:
1. General: Take three (3) cylinders and test, for each 50 cubic yards of each concrete mix being placed each day. Test first cylinder at the age of 7 days and the other at 28 days; cylinder for 28-day test will not be broken if cylinder for 7-day test meets 28 day strength. Hold third cylinder for 56 day test, if required.
2. Reinforcement: Make one (1) tensile test and one (1) bend test of specimen taken from each 10 tons of steel delivered to the site.
C. Retesting: Cost of retests or coring because of understrength, questionable or defective concrete will be paid for by Contractor.

3.4 CLEANING: Clean exposed surfaces after finish treatment to remove stains, markings, dust, and debris. Do not use cleaning materials or processes that could change the appearance of concrete finishes. Protect adjacent surfaces from staining or damage due to cleaning operations.

* * *

Section 32 17 23
PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY: Provide Pavement Markings, as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.

B. Americans with Disabilities Act (ADA):

1. General: Americans with Disabilities Act of 1990, ADA - 42 U.S. Code Chapter 126.
2. ADA Standards for Accessible Design: U.S. Department of Justice, 28 CFR Part 36.

C. Master Painters Institute (MPI): Painting Manuals.

D. National Paint and Coatings Association (NPCA): Guide to U.S. Government Paint Specifications.

E. State of California, Department of Transportation (CalTrans): CalTRANS Standard Specifications.

1.3 SUBMITTALS:

A. General: Submit product data and a certificate stating compliance with federal, state and local VOC regulations.

B. Samples:

1. General: Submit manufacturer's standard colors for each surface finishing product specified.

C. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Pavement-Marking Paint:

1. General: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 45 minutes; formulated specifically for marking traffic lines on asphaltic concrete and portland cement concrete paving, in compliance with California Air Resources Board (CARB) and local air quality authorities.
2. Parking and Traffic Control Markings: Provide reflective materials.
3. Colors: Selected by Architect.

B. Abrasive Grit: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent white aluminum oxide and not less than 25 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

2.2 MIXING: Mix paints at the factory; do not alter or reduce materials except as directed by manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements: Do not apply during inclement weather conditions, or when surface temperatures exceed 95 deg F or are under 50 degrees F.

B. Examination: Examine conditions of work in place before beginning work; report defects.

C. Measurements: Take field measurements; report variance between plan and field dimensions.

D. Protection: Protect adjacent surfaces not scheduled for paint finish from damage resulting from painting operations.

E. Surface Preparation: Allow paving to cure for 30 days minimum before pavement marking. Sweep and clean surface to eliminate loose material and dust.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.

B. Pavement Marking:

1. General: Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
2. Application:
   a. General: Using proper masking, stencils and mechanical application equipment, apply two (2) coats of paint to clean, dry surfaces to produce pavement markings of dimensions required, to a minimum wet film thickness of 15 mils, with uniform, straight edges.

b. Parking and Traffic Control Markings:
   1. General: Conform to CalTrans Standard Specifications - Chapter 6, Markings, and jurisdictional requirements. Provide minimum of two coats paint.
   2. Traffic Striping: 4 inch line width unless otherwise indicated, with uniform, straight edges without overspray.
   3. Traffic Directional Markings and Accessibility Logo: Provide reflective material in traffic directional markings if required by jurisdictional authority.
   4. Curbs: Paint full vertical face and first 6-inches of horizontal plane at top of curb or combination curb/paving.
   5. Hatching: Provide hatching in parking areas, including accessible parking stalls, as shown or as required.
   6. Standard and Compact Stall Markings: Marking styles and widths as shown.
   7. Accessible Stalls and Path of Travel:
      a.) General: Per CBC.
      b.) Painted Lines and Markings:
         1.) General: 3-inches wide minimum; color No. 15090 per Federal Standard 595B.
         2.) Electric Vehicle Charging: Identify charging capacity.
      c.) Tactile Warning Lines: Per CBC at accessible stalls and path of travel.
      d.) Abrasive Grit: Broadcast uniformly into wet pavement markings rate of 25 pounds per 100 square feet and repaint line.
c. Playground Markings: Provide as shown; colors as selected by the Architect.

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Section 32 31 11
VEHICULAR SLIDE GATE OPERATOR

PART 1 - GENERAL

1.1 SUMMARY: Provide Vehicular Slide Gate Operator as shown and specified per Contract Documents.

1.2 REFERENCES:

A. American Society for Testing and Materials (ASTM):
   1. General: Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
   2. ASTM F2200: Standard Specification for Automated Vehicular Gate Construction.

B. National Electrical Manufacturers Association (NEMA): NEMA ICS 6 - Industrial Control and Systems: Enclosures.

C. National Fire Protection Association (NFPA): NFPA 70 - National Electrical Code.

D. Underwriters Laboratories, Inc. (UL):
   1. UL 325: Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.
   2. UL 991: Standard for Tests for Safety-Related Controls Employing Solid-State Devices.

1.3 SUBMITTALS:

A. General: Submit product data.

B. Shop Drawings: showing layout, profiles, and product components, including anchorage, edge connections, and accessories.

C. Closeout:
   1. General: Submit operation and maintenance data, including risers, layouts, and special wiring diagrams.
   2. Guarantee: Submit in required form for a period of five (5) years from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE:

A. Qualifications: Installer specializing in the work of this Section with minimum three (3) years documented experience; manufacturer approved.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Vehicular Slide Gate Operator:
   1. General: Model No. 9100 manufactured by DoorKing, Inc.
   2. Alternate Manufacturers: Comparable products manufactured by the LiftMaster, a Division of the Chamberlain Group (CGI), or accepted equal.

B. Sliding Gate Size:
   1. General: Refer to Section 32 31 13 - CHAIN LINK FENCES AND GATES.
   2. Gate Size:
      a. Length: 30'-0" maximum.
      b. Weight: 1000 lbs. maximum.

C. Function:
   1. General: Microprocessor based solid-state control board interacting with card readers, RF transmitters, access control systems, ticket machines, other activating devices as required, external devices (photo-eyes, contact edges) for entrapment protection and vehicle (loop) sensing systems. Control board shall include built-in close timer (1-25 seconds), built-in ports for two (2) plug-in loop detectors, partial open input, programming switches to set various operating modes, inherent magnetic pulse obstruction sensing reverse system. System shall employ Fail-Safe operation upon primary (AC) power outage.
   2. Operating Speed: Eleven (11) inches per second.

D. Operation:
   1. General:
      a. Motor: 1/2 HP, continuous duty.
      b. Electrical Power Requirements: 115 VAC.
      c. Primary Reduction: Adjustable clutch, single cog belt drive train.
      d. Pulling Medium: #40 roller chain.
      e. Magnetic Limit Switches: Automatic setting.
      f. Operating Switches: Built-in power (on-off), reset and operating switches.
      g. Convenience Outlets: Two (2) 115 VAC for accessory transformers.
   2. Enclosure:

a. General: Manufacturers standard, pad mounted.
b. Configuration: Left or right hand mount; rear mounting configurations.

3. Fail-Safe Operation:
   a. General: Automatically transfers to fail-safe mode upon loss of primary (AC) power allowing the gate to be opened without special knowledge, keys or other mechanism.
   b. Dead Bolt Lock: Solenoid dead bolt engages if an attempt is made to force the gate open.
4. Entrapment Protection:
   a. General: Per UL 325 AND ASTM F2200 requirements.
   b. Loop Detectors: Manufacturers Standard plug-in type.
   c. Non-contact Sensor: Manufacturers standard photo-electric eye.
   d. Contact Sensor: Manufacturers standard sensing edge.

E. Anchors: As recommended by manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION:
A. Examination: Examine conditions of work in place before beginning work; report defects.
B. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Operation:
   1. General: Install pad mounted, firmly secured, plumb and level.
   2. Gate: Refer to Section 32 31 13 - CHAIN LINK FENCES AND GATES, and as shown.
C. Electrical Connection:
   1. General: Refer to Division 26 - ELECTRICAL.
   2. Wiring: Per NFPA NFPA 70 requirements.
   3. Splices: Provide easy access in junction boxes or on terminal boards.
   4. Cable Runs: Tag and identified in all junction boxes .

3.3 ADJUSTMENT:
A. General: Prior to acceptance, adjust system and programing to meet on-site conditions and adjust moveable gate parts to assure smooth operation.
B. Testing: Test for proper operation and adjust until satisfactory results are obtained.

3.4 DEMONSTRATION:
A. General: Upon completion demonstrate the operation of the system operation in presence of Architect and Owner representative.
B. Start-up Maintenance: Provide regular examination, service and maintenance for one (1) year after final acceptance by Owner.

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Section 32 31 13
CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY: Provide Chain Link Fencing, as shown and specified per Contract Documents.

1.2 REFERENCES:
- A. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
- B. Chain Link Fence Manufacturing Institute (CLFMI): CLFMI WLG2445 - Chain Link Fence Wind Load Guide for the Selection of Line Posts and Line Post Spacing.

1.3 SUBMITTALS:
- A. General: Submit product data, shop drawings and samples.
- B. Certificates: Manufacturer's certification that metal components meet standards as specified.
- C. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.

1.4 QUALITY ASSURANCE: Installer specializing in the work of this Section with minimum one (1) years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS:
- A. Chain Link Fencing:
  1. General: Galvanized Chain Link Fence manufactured by Builders Fence Co., Inc.
  2. Alternate Manufacturers: Comparable products manufactured by the Anchor Fence Co., Inc., or accepted equal.
  3. Framework:
     - a. General: Per ASTM F1083; pipe sizes indicated are outside diameter, unless otherwise noted.
     - b. Posts:
       1. General: ASTM A36, Schedule 40 steel pipe, standard weight; or C section roll formed of equal or greater strength.
       2. Line: 2.38 inch diameter.
       3. End and Terminal: 2.88 inch diameter.
       4. Gate: 4.5 inch diameter.
     - c. Top Rail and Braces: 1.66 inch diameter, plain end, sleeve coupled; ASTM A36, Schedule 40 pipe, or C section roll formed of equal or greater strength; provided with malleable iron fittings.
     - d. Diagonal Bracing: 3/8 inch diameter truss rods.
     - e. Gate Frame: 1.66 inch diameter, ASTM A36, Schedule 40 pipe, for fittings and truss rod fabrication.
     - f. Wire:
       1. General: Aluminum alloy steel wire.
       2. Tie: 9 gage.
       3. Tension: 7 gage.
     - g. Bands: 14 gage x 1 inch wide steel; chamfer or ease projecting edges.
  4. Fabric:
     - a. General: Diamond mesh interwoven wire per CS246, "Steel Chain Link Galvanized Fence Fabric"; knuckled top and bottom selvage; one piece fabric widths, 9 gage steel wire, 2 inch mesh.
     - b. Vinyl Slat:
       1. General: Series 3000 WSlat's sized to fit specified mesh manufactured by Fence Screen; color selected by the Architect.
       2. Alternate Manufacturers: Comparable products manufactured by the PrivacyLink, or accepted equal.
  5. Accessories:
     - a. Caps: Cast steel or malleable iron, galvanized; sized to post diameter, set screw retainer.
     - b. Gate Hardware:
       1. Hinges: Malleable iron, pressed or forged steel, non-lift-off type, offset to permit 180 degree gate opening. Ball and socket hinges not acceptable.
       2. Latch: Malleable iron; provide padlock eye as integral part of latch.

3. Gate Stop and Holder: Malleable iron; to engage gate frame and hold in open position.
4. Sliding Gate Track: Track, ball bearing hangers, guides, stays, bracing and accessories required for proper operation; heavy duty design.

6. Finishes:
   a. Galvanizing:
      1. General: Per ASTM A513, ASTM A385 or ASTM A123, as applicable.
      2. Repair Treatment:
         a.) Rod: Per ASTM A780.
         b.) Coating: Per MIL-P-46105.

B. Concrete: Per Section 03 30 10 - CONCRETE.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Environmental Requirements: Do not install posts in wet or freezing conditions. Excavations shall be dry at the time of erection.
B. Examination: Examine conditions of work in place before beginning work; report defects.
C. Measurements: Take field measurements; report variance between plan and field dimensions.

3.2 INSTALLATION:

A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Line Posts: Space posts 10'-0" on center with posts set in minimum 12 inch diameter holes, 36 inches deep. Set in concrete; verify vertical and top alignment. Dome top of concrete and trowel smooth.
C. Brace Assembly:
   1. General: Between end, gate, or corner posts to first line post; set brace equally between top rail and bottom fabric selvage.
   2. Truss Brace: 3/8 inch round rod extending from line post to end, gate, or corner post, where shown. Provide crossed diagonal adjustable length truss rods on non-welded gate frames and also welded gate frames where corner rigidity is insufficient to ensure no sag.
D. Fabric: Install fabric on security side of fence with about 1-1/2 inches between ground and bottom barbs.
E. Tension Wire: Install taut, with 6 gage wire at bottom of fence fabric.
F. Caps: Install per manufacturer's instructions.
G. Gates:
   1. General: Assemble gates per referenced standards; install plumb, level and secure, with full swing or slide without interference. Install ground set items in concrete. Adjust hardware for smooth operation.
   2. Hardware:
      a. Hinges: Provide 1-1/2 pair hinges for each leaf over 6'-0" nominal height.
      b. Latch: Permit operation from either side of gate.
   3. Sliding Gates: Align track and set cane bolt and ground set keeper for proper operation.
H. Tie Wires: As recommended by manufacturer, attaching fabric to frame firmly with ends twisted two full turns, minimum; bend and blunt ends of all wires to prevent hazard.
I. Fasteners: Install nuts for tension band and hardware bolts on side of fence opposite fabric side; peen ends of bolts to prevent removal of nuts.
J. Galvanizing: Repair zinc coating damaged in shop or during field erection with specified repair compound.
K. Slat’s: Install as shown, per manufacturers instructions.

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Division 33 - UTILITIES

Section 33 00 10
SITE UTILITY SERVICES

PART 1 - GENERAL
1.1 SUMMARY: Provide Site Utility Services, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. General: Refer to Section 01420 - REFERENCES for reference standards, applicable codes and definitions. Perform Work in accordance with municipal agency and utility company standards and requirements.
B. American Public Works Association (APWA): Standard Specifications for Public Works Construction.
C. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
D. American Welding Society (AWS): Welding Standards.
E. American Water Works Association (AWWA): Standards.
F. State of California, Department of Transportation (CalTrans): Standard Specifications.
G. Cast Iron Soil Pipe Institute (CISPI): Standards.
H. California State Industrial Accident Commission (CSIAC): Trench Construction Safety Orders.
I. National Fire Protection Association (NFPA): NFPA 13 - Installation of Sprinkler Systems.
J. Intertek Testing Services (ITS): Standards.
K. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory and Building Material Directory.
1.3 SUBMITTALS:
A. General: Submit product data.
B. Certificates: Submit certificate in lieu of manufacturer's name and pressure rating marked on valve body of valves and gas cocks, as required.
C. Closeout: Submit maintenance data and guarantee in required form for a period of one (1) year from date of final acceptance by Owner.
1.4 QUALITY ASSURANCE: Welders to be AWS certified.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. General: Refer to Civil Drawings for specific material specifications.
B. Piping:
1. Sanitary Sewer:
a. Outside Property Line: Per applicable utility service regulations and standards.
b. Within Property: As shown.
2. Water:
a. To Meter and Detector Check: Per applicable utility service regulations and standards.
b. Potable Water from Meter: As shown.
c. Meter: Per jurisdictional requirements.
3. Natural Gas:
a. To Meter: Per applicable utility service regulations and standards.
b. From Meter: As shown.
C. Valves:
1. General: Outside property line, conform to applicable utility service regulations and standards.
2. Water:
a. General: Per AWWA Standards.
b. Fire Protection: Per UL and FM Standards.
3. Gas: Per AWWA Standards.
4. Valve Boxes: As detailed. Precast concrete boxes with extensions and cast iron frame and cover. Cover marked "Water" or "Gas" applicable to valve.
D. Backflow Preventers: Per applicable utility service requirements.
E. Electrical and Communications Service:
1. Outside Property Line: Per applicable utility service regulations and standards.
2. Within Property: As shown.

F. Detectable Warning Tape: Acid and alkali resistant polyethylene film manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick minimum, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep.
G. Bedding Materials: Refer to Section 31 20 10 - EARTHWORK.
H. Drainage Specialties: Per Section 33 40 00 - STORM DRAINAGE UTILITIES.

PART 3 - EXECUTION

3.1 PREPARATION:
A. Scheduling: Coordinate off-site service connections and connections within the building line with the work of this Section.
B. Examination: Examine conditions of work in place before beginning work; report defects.
C. Protection: Conform to "Trench Construction Safety Orders", California State Industrial Accident Commission.

3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified. Lay out systems by instrument; verify location and elevation of points of utility service and existing crossing utilities prior to excavation; notify Architect of discrepancies noted. Lay pipe true to line and uniform grade commencing at point of utility service connection. Make connections to utility service and building systems.
B. Excavation and Bedding:
1. General: Per Section 31 20 10 - EARTHWORK. Trench width to be a minimum of 12 inches wider than outside diameter of pipe, bottom smooth and free of irregularities or rock points.
2. Bedding: Provide bed of clean sand for the full length of the pipe; minimum 4 inches thick, or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
C. Gravity Flow Sanitary Sewer: Per manufacturer's recommendations for jointing and installation; provide manufacturer's adapters for jointing to other pipe materials.
D. Water Piping:
1. Jointing: Per manufacturer's recommendations.
2. Thrust Blocks: Construct as detailed.
3. Valves: Place at required locations, vertically plumb; set valve boxes to finish elevation.
4. Utility Service Meters: Locate as shown.
E. Gas Piping:
1. Valves: Place at required locations, vertically plumb; set valve boxes to finish elevation.
2. Utility Service Meters: Locate as shown.
F. Building Systems Piping: Refer to Division 22 - PLUMBING.
G. Electrical and Communications Service: Per Division 26 - ELECTRICAL and Division 27 - COMMUNICATIONS.
H. Detectable Warning Tape:
1. General: Identify pipe and conduit with color coding as follows:
2. Red: Electric.
3. Yellow: Gas, oil, steam, and dangerous materials.
4. Orange: Telephone and other communications.
5. Blue: Water systems.
6. Green: Sewer systems.
I. Backfilling:
1. General: Per Section 31 20 10 - EARTHWORK do not start backfill operations until required testing has been accomplished.
2. Detectable Warning Tape: Install directly above utilities, as shown. Verify that inscribed description is properly coordinated with identified utility.
3. Trenches and Excavations: Backfill with clean sand to 12 inches above top of pipe, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Place in 6 inch lifts; compact each layer to density of adjacent undisturbed soil. Jetting will not be allowed.

3.3 FIELD QUALITY CONTROL:
A. Testing:
1. General: Test systems for water tightness at a hydrostatic pressure as follows:
2. Sewer: 10 psi for a period of 4 hours.

3. Water:
   a. General: 150 psi for a period of 4 hours.
   b. Fire Protection: Per NFPA 13 and 24.

B. Disinfection: Flush and disinfect per Section 33 13 05 - DISINFECTION.

C. Retesting: Make necessary corrections to work that is not in conformance with specified requirements and retest at Contractor's expense.

* * *

Section 33 13 05
DISINFECTION

PART 1 - GENERAL
1.1 SUMMARY: Provide Disinfection of Water Distribution Systems, as shown and specified per Contract Documents.
1.2 REFERENCES:
A. American Water Works Association (AWWA): Standards.
1. AWWA B300: Standard for Hypochlorites.
2. AWWA B301: Standard for Liquid Chlorine.
3. AWWA B302: Standard for Ammonium Sulfate.
4. AWWA B303: Standard for Sodium Chlorite.
5. AWWA C651: Standards for Disinfecting Water Mains.
1.3 SUBMITTALS:
A. Test Reports:
1. General: Date issued, project name, and testing laboratory name, address, telephone number and name of person collecting samples.
2. Disinfection:
a. Disinfectant: Type and form used.
b. Disinfectant Injection: Date, start and completion time.
c. Test Locations: Identify on Site Plan.
d. Flushing: Date, start and completion time.
e. Disinfectant Residuals:
1. General: Initial and 24 hour quantity in treated water in ppm for each outlet tested.
2. After Flushing: ppm for each outlet tested.
3. Bacteriological:
a. Water Sample Collection: Time and date.
b. Test Locations: Identify on Site Plan.
c. Disinfectant Residuals: Initial and 24 hour in ppm for each outlet tested.
d. Coliform Bacteria: Test results for each outlet tested.
B. Certificates:
1. General: Submit statement from testing agency, bearing bacteriologist's signature, certifying that the cleanliness of water distribution system meets or exceeds local and state jurisdictional requirements.
2. Certificate of Compliance: Provide from authority having jurisdiction indicating acceptance and approval of water system.
C. Closeout: Submit maintenance data.
1.4 QUALITY ASSURANCE:
A. General: Installer specializing in disinfecting potable water systems specified in this Section with minimum three (3) years documented experience.
B. Testing Firm: Company specializing in testing potable water systems, approved by the State of California.

PART 2 - PRODUCTS
2.1 MATERIALS:
A. Disinfection Chemicals: AWWA type as required by local jurisdictions.

PART 3 - EXECUTION
3.1 PREPARATION: Examine conditions of work in place before beginning work; report defects.
3.2 INSTALLATION:
A. General: Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
B. Disinfection: Provide and attach required equipment to site water lines to perform the work of this Section. Introduce treatment into system and maintain disinfectant in system for 24 hours. Flush, circulate, and clean until cleanliness required by jurisdiction is achieved. Replace permanent system devices removed for disinfection.
3.3 FIELD QUALITY CONTROL:
A. General: Refer to section 01 43 00 - QUALITY ASSURANCE.
B. Field Testing: Test samples in accordance with AWWA C651 and jurisdictional criteria as required.

Section 33 71 19
UNDERGROUND CONDUIT SYSTEM

PART 1 - GENERAL

1.1 CONDITIONS:

A. The Requirements of General Conditions and Special Conditions apply to Work of this Section as if fully repeated herein.

1.2 WORK INCLUDED:

A. Encase and install underground power and signal system feeder conduits outside foundation line as specified or as shown. This shall include, but not be limited to, all excavation, draining trenches, sloping of conduit, backfilling, compacting, and removal of excess dirt. Branch circuit conduits and signal system conduits smaller than 2” do not require encasement unless otherwise indicated on the Drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Conduit:

1. Nonmetallic Conduit: NEMA TC 2 Schedule 40 and 80 PVC.
2. Rigid steel Conduit: ANSI C80.5.
3. PVC coated metal Conduit: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.

B. Interlocking plastic module spaces which provide three inch (3") spacing between conduits shall be used to hold ducts in place before and during sand envelope installation.

C. Couplings and Joint Cement: As recommended by manufacturer and compatible with conduit used. Couplings shall fit conduit securely.

D. Adapters Necessary for Transition from Metallic Conduit to Non-metallic Conduit: Same manufacturer as non-metallic conduit used.

E. Manufacture conduit in nominal Iron Pipe Size (IPS) as indicated on Drawings.

F. Underground warning tape: 6-inch wide, yellow polyethylene tape, with continuous black imprinting.

G. Conduit tape: 2 or 4 inch wide black 20 mil vinyl conduit wrap.

2.2 Precast Concrete Pull Boxes:

A. Material: Reinforced precast concrete.

B. Construction: Where not otherwise noted or detailed, provide bottomless units with reinforced concrete bolt down cover. Provide steel checker plate bolt down cover in traffic areas. Outside dimension 13” x 19” x 24” deep minimum.

2.3 PRECAST CONCRETE MANHOLES/VAULTS

A. Material: Reinforced precast concrete.

B. Construction: Modular sections with tongue-and-groove joints.

C. Reinforcing: AASHTO Classification H-20 unless otherwise indicated.

D. Size and Shape: As indicated on the Drawings.

PART 3 - EXECUTION

3.1 Excavation and Backfilling:

A. Be responsible for all excavation, shoring, bracing, draining trenches, roadway cuts, repairing of finished surfaces, sloping of ducts toward pull hole, forming of conduit assembly and protective concrete envelope, backfilling, tamping and removal of excess earth. Make excavation in manner to provide uniform bearing for conduit bank.

B. After required tests and inspection, backfill ditch and tamp. First foot above conduit bank shall be hand backfilled with rock-free clean earth. Be responsible for any ditches that cave in. Tamp backfill as follows:
   1. Roadways - ninety percent (95%)
   2. Non-Traffic areas – ninety percent (90%)
   3. Planter areas – eighty five percent (85%)

C. In asphalt or concrete paved areas, backfill only to sub-grade level. Minimum conduit depth of pipe crown shall be two feet (2') below finished or natural grade.

D. Restore all surfaces, roadways, walks, curbs, walls, existing underground installations, and other construction or improvements damaged by installation of Electrical Work, to original condition in an acceptable manner.

E. Maintain all warning signs, barricades, flares, and lanterns as required.

3.2 Conduit Installation:

A. Support conduit for entire length on undisturbed original earth.

B. Include spare conduits in conduit banks as indicated on drawing details.

C. Install no more that an equivalent of three 90-degree bends between boxes.

D. Minimum Radius Bends: As required by the C.E.C. for main electrical duct runs.

E. Encase all underground conduits in sand. Encase all underground conduits two inches (2") or larger in sand, except within confines of building. Arrange conduit in conduit bank to give three inches (3") spacing vertically and horizontally between conduits placed every five feet (5') and minimum of three inch (3") thick sand envelope. All underground conduit runs shall have minimum of eighteen-inch (18") cover. Install conduits with three-inch (3") per one hundred feet (100') slope from building toward pull hole.

F. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

G. Firmly secure and tie down conduits and spacer assembly to prevent displacement or "floating" of conduits as concrete or backfill is placed. Leave no wood in encasement or backfill.

H. Waterproof all conduit joints according to manufacturer's recommendations. Seal ends of conduits entering building or pull boxes watertight.

I. Each conduit shall have an approved fire-retardant pull rope before and after cable is installed and in all spare conduits and shall be capped at pull hole.

J. Surfaces upon which concrete is to be placed shall be free of standing water, mud, and debris. Moisten absorptive surfaces against which concrete is to be placed.

K. Place concrete only in presence of Project Coordinator.

L. Provide PVC coated rigid steel conduits were passing thru concrete slab or wrap metallic conduits with a double half-lapped layer of 10-mil electrical tape where conduits pass through concrete slab.

M. Provide underground warning tape for all feeder and communication system conduits. Install tape 8 inches below finished grade.

N. After encasement and backfill for conduit is completed, perform tests by drawing through each conduit, mandrel of appropriate size as approved by Project Coordinator. A brush shall not be used in any plastic conduit.

O. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

3.3 CONCRETE COMPOSITE HANDHOLE installation

A. Provide minimum 12” depth of crushed rock or pea gravel below boxes for drainage.

B. Covers shall be marked “ELECTRIC,” “SIGNAL,” “GROUND’ or as indicated on drawings.

C. Install boxes flush with finished grade or surface material.
D. Provide hold down bolts for all covers.
E. Ground bond steel cover plate with insulated green grounding conductor.

3.4 PRECAST MANHOLE/VAULT INSTALLATION

A. Install and seal precast sections in accordance with manufacturer's instructions.
B. Install manholes/vaults plumb.
C. Use precast neck and shaft sections to bring manhole cover to finished elevation.
D. Use precast extension rings to bring vault cover to finished elevation.
E. Attach cable racks to inserts after manhole/vault installation is complete.
F. Provide minimum of 18-inch gravel sump under manholes and large vaults. Calculate and specify cubic yardage required for project bases.

END OF SECTION

Section 33 71 73
ELECTRICAL UTILITY SERVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes arrangement with Utility Company for permanent electric service; payment of Utility Company charges for service; service provisions; and utility metering equipment.

1.2 SYSTEM DESCRIPTION

A. Utility Company: Pacific Gas & Electric

B. System Characteristics: 208Y/120 volts, three phase, four-wire, 60 Hertz.

C. Service Entrance: Underground.

D. Underground Service Provisions: Underground service entrance to building service entrance equipment.

1. Utility Raceway Connection: At Utility Company's manhole.
2. Utility Service-Entrance Conductor Connection: At Utility Company's pad-mounted transformer.

E. Vault Service Provisions: Service entrance raceways from Utility Company vault, final connections by Utility Company.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Submit Utility-Company-prepared drawings.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with Utility Company written requirements.

B. Maintain one copy of each document on site.

1.5 FIELD MEASUREMENTS

A. Verify field measurements as indicated on Utility Company drawings.

1.6 COORDINATION

A. Coordinate with utility company, relocation of overhead or underground lines interfering with construction. Where power lines are to be relocated, bill utility costs, directly to Owner.

B. Contact utility company regarding charges related to service installation. Include utility charges in this contract.

C. Utility charges for service installation will be paid by Owner and are not part of this contract.

PART 2 - PRODUCTS

2.1 UTILITY METERS

A. Furnished by Utility Company.

2.2 UTILITY METER BASE

A. Furnished by Utility Company.

2.3 METERING TRANSFORMER CABINET

A. Include provisions for padlocking and sealing.

2.4 TRANSFORMER PAD

A. Product Description: Per PG&E Requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify service equipment is ready to be connected and energized.

3.2 INSTALLATION

A. Install service entrance conduits to building service entrance equipment. Utility Company will connect service lateral conductors to service entrance conductors.

B. Install busway from Utility Company's vault to building service entrance equipment. Utility Company will connect service lateral conductors to service entrance busway.

C. Install cast-in-place concrete pad for Utility Company transformer, in accordance with PG&E requirements.

END OF SECTION

34 through 49 - UNASSIGNED

NOT USED

* End Division 49 *

CONSTRUCTION DOCUMENTS FOR:

YOLO COUNTY
AG DEPARTMENT
SHOPS BUILDING

120 WEST MAIN STREET, WOODLAND, CA

COUNTY JOB NO.: WA20-103-3719-AG

GENERAL NOTES

1. THE TEAM OF DESIGN PROFESSIONALS FOR THIS PROJECT INCLUDE:

ARCHITECTURAL:	COMSTOCK JOHNSON ARCHITECTS, INC. 10520 ARMSTRONG AVE. MATHER, CA 95655 DAVE HELMS 916-362-6303
STRUCTURAL:	BEVIER STRUCTURAL ENGINEERING, INC. 2479 SUNRISE BLVD., GOLD RIVER, CA 95670 JEFF KOVACH 196-631-3030
PLUMBING:	NEELEY MECHANICAL 800 W MAIN ST., SUITE 1460, BOISE, ID 83702 MARK NEELEY 916-878-9741
MECHANICAL:	NEELEY MECHANICAL 800 W MAIN ST., SUITE 1460, BOISE, ID 83702 MARK NEELEY 916-878-9741
ELECTRICAL:	ECOM 1455 RESPONSE ROAD, SUITE 140, SACRAMENTO, CA 95815 BEN SCHENKLER 916-641-5600
CIVIL:	LAUGENOUR AND MEIKLE 608 COURT STREET, WOODLAND, CA 95695 BRYAN BONINO 530-662-1755
LANDSCAPE:	GARTH RUFFNER LANDSCAPE ARCHITECT 4120 DOUGLAS BLVD, SUITE 306, PMB 301, ROSEVILLE, CA GARTH RUFFNER 916-797-2576

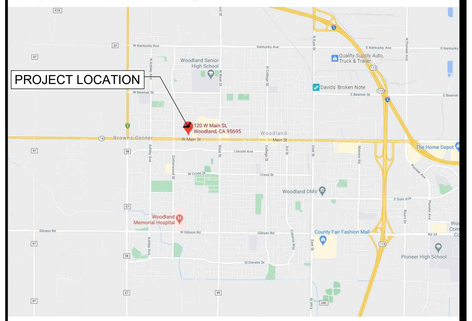
2. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS SHALL NOTIFY THE OWNER OF ANY ERRORS AND/OR OMISSIONS CONTAINED IN THE CONSTRUCTION DOCUMENTS PRIOR TO ORDERING MATERIALS AND/OR COMMENCING CONSTRUCTION.
3. PROVIDE ONE FIRE EXTINGUISHER, 2A:10BC TYPE, EACH 3,000 SQUARE FEET OF FLOOR SPACES, AND/OR A MAXIMUM TRAVEL DISTANCE OF 75' FROM THE EXTINGUISHER. SEE FLOOR PLAN FOR LOCATIONS.
4. CONTRACTOR TO PROVIDE A CONSTRUCTION WASTE MANAGEMENT PLAN TO RECYCLE AND/OR SALVAGE FOR REUSE A MINIMUM OF 50 PERCENT OF THE NON-HAZARDOUS CONSTRUCTION AND DEMOLITION WASTE IN ACCORDANCE WITH SECTION 5.408.1.1, 5.408.1.2 OR 5.408.1.3 OF THE 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE.
5. ALL FINISH MATERIALS INCLUDING ADHESIVES, SEALANTS, CAULKS, PAINTS AND COATINGS, AEROSOL PAINTS AND COATINGS, COMPOSITE WOOD PRODUCTS, RESILIENT FLOORING SYSTEMS AND CARPET SYSTEMS SHALL MEET OR EXCEED MINIMUM REQUIREMENT FROM TABLES 5.504.4.1, 5.504.4.2, 5.504.4.3 AND 5.504.5 OF THE 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE. CONTRACTOR SHALL PROVIDE DOCUMENTATION, MANUFACTURER'S PRODUCT SPECIFICATIONS OR CHAIN OF CUSTODY OR OTHER METHODS THAT ARE ACCEPTABLE AS VERIFICATION FOR COMPLIANCE BY THE ENFORCING AGENCY. PROVIDED DOCUMENTATION SHALL VERIFY THAT EACH MATERIAL AND/OR FINISH MEET OR EXCEEDS THE MINIMUM COMPLIANT STANDARD. DOCUMENTATION SHALL ALSO BE KEPT ON THE CONSTRUCTION SITE FOR FIELD VERIFICATION BY THE ENFORCING AGENCY.

PROJECT SCOPE

PROJECT SCOPE INCLUDES:

1. NEW 6,020 S.F.PRE-ENGINEERED METAL BUILDING WITH INTERIOR TENANT IMPROVEMENTS
2. AREAS OF ADJUSTED GRADING AND PAVING ALONG WITH STRIPING AND SEALING OF ASPHALT FOR PARKING STALLS.
3. NEW PERIMETER FENCE AND ACCESS GATES.
4. INSTALLATION OF TWO DUAL CHARGING VEHICLE CHARGING STATIONS
5. (E) BUILDING TO REMAIN BUT NOT BE INCLUDED IN SCOPE OF WORK

VICINITY MAP- N.T.S.



PROJECT DATA.

JOB SITE ADDRESS APN	120 W. MAIN ST., WOODLAND, CA 006-025-005-000
JURISDICTION	YOLO COUNTY
ZONING	CORRIDOR MIXED USE - CX
OCCUPANCY GROUP & BUILDING USE	(B) BUSINESS, (S-1) STORAGE, (S-2) PARKING & STORAGE
CONSTRUCTION TYPE	II-B
BUILDING CODE	2022 CA BUILDING CODE – VOLUMES 1 & 2 (CBC), 2022 CA GREEN BUILDING STANDARDS CODE (CGBSC) 2022 CA PLUMBING CODE (CPC) 2022 CA MECHANICAL CODE (CMC) 2022 CA ELECTRICAL CODE (CEC) 2022 CA ENERGY CODE (CEC) 2022 CA FIRE CODE BASED ON THE 2018 IFC CALIFORNIA CODE OF REGULATIONS-TITLE 19
TOTAL BUILDING AREA	6,020 S.F. ±

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A0.1B	CAL GREEN 2 OF 3
A0.1C	CAL GREEN 3 OF 3
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A0.3	ACCESSIBILITY DETAILS
A1.0	SITE PLAN
A1.1	EXPANDED PARKING PLAN
A2.0	FLOOR PLAN AND DOOR SCHEDULE
A2.1	REFLECTED CEILING AND ROOF PLANS
A3.0	EXTERIOR ELEVATIONS
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A5.1	DETAILS

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S1.2	GENERAL NOTES AND TYPICAL DETAILS
S1.3	STRUCTURAL DETAILS
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M0.2	HVAC SCHEDULES
M0.3	HVAC SCHEDULES
M2.1	HVAC FLOOR PLAN
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M5.2	HVAC DETAILS
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PLUMBING

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P0.3	PLUMBING SCHEDULES
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E0.2	TITLE 24 COMPLIANCE FORMS
E0.3	TITLE 24 COMPLIANCE FORMS
E0.4	TITLE 24 COMPLIANCE FORMS
E0.5	TITLE 24 COMPLIANCE FORMS
E1.0	SITE PLAN- ELECTRICAL
E2.0	AG SHOP- POWER & SIGNAL AND LIGHTING
E5.0	ONE LINE DIAGRAM AND LOAD CALCS
E6.0	ELECTRICAL DETAILS
E6.1	ELECTRICAL DETAILS
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E6.4	ELECTRICAL DETAILS

ONSITE CIVIL

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C003	GENERAL NOTES
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L2	PLANTING PLAN
L3	LANDSCAPE DETAILS
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ENERGY NOTES

1. INSULATION @ EXTERIOR WALLS: R-13 BATT INSULATION FROM FLOOR TO CEILING.
2. INSULATION @ UNDERSIDE OF ROOF DECK: R-19 BATT BELOW ROOF.
3. INSULATION @ FULL HEIGHT WALLS: R-19.

VERIFY INSULATION REQUIREMENTS WITH DESIGN BUILD ENGINEER.

DEFERRED SUBMITTALS

FIRE SPRINKLER

FIRE ALARM

ABBREVIATIONS

℄	PROPERTY LINE	C.I.	CAST IRON	DTL.	DETAIL	FLASH.	FLASHING	I.D.	INSIDE DIAMETER	M.R.	MOISTURE RESISTANT	P.LAM.	PLASTIC LAMINATE	S.B.	SPLASH BLOCK	T.J.	TRUSS JOIST
&	AND	C.J.	CONSTRUCTION JOINT	D/W	DISHWASHER	FLEX.	FLEXIBLE	IN.	INCHES	M.S.	MACHINE SCREW	PLAS.	PLASTER	S.C.	SOLID CORE	T.O.	TOP OF
∠	ANGLE			DWG.	DRAWING	FLR.	FLOOR	INFO.	INFORMATION	M.T.	METAL THRESHOLD	PLWD.	PLYWOOD	S.C.D.	SEAT COVER DISPENSER	T.P.D.	TOILET PAPER DISPENSER
@	AT	CL.	CLOSET	(E)	EXISTING	FLUOR.	FLUORESCENT	INST.	INSTALL	MTD.	MOUNTED	P.M.	PRESSED METAL	S.D.	SOAP DISPENSER	TRANS.	TRANSOM
℄	CENTERLINE	CLG.	CEILING	EA.	EACH	F.O.	FACE OF	INSUL.	INSULATION	MTL.	METAL	PR.	PAIR	SECT.	SECTION	T-U	TILT-UP
Ø	DIAMETER	CLR.	CLEAR	E.D.F.	ELECTRIC DRINKING FOUNTAIN	F.O.B.	FACE OF BRICK	INT.	INTERIOR	MUL.	MULLION	PREFAB.	PREFABRICATED	S.F.	SQUARE FEET	T.V.	TELEVISION
#	NUMBER	C.M.U.	CONCRETE MASONRY UNIT	E.J.	EXPANSION JOINT	F.O.C.	FACE OF CONCRETE					PRELIM.	PRELIMINARY	SHR.	SHOWER	TYP.	TYPICAL
d	PENNY	COL.	COLUMN	EL.	ELEVATION	F.O.F.	FACE OF FINISH	JAN.	JANITOR	(N)	NEW	PROP.	PROPERTY	SHT.	SHEET		
		COMP.	COMPOSITION	ELEC.	ELECTRICAL	F.O.M.	FACE OF MASONRY	JST.	JOIST	N/A	NOT APPLICABLE	P.S.F.	POUND PER SQUARE FOOT	SHTG.	SHEATHING	U.B.C.	UNIFORM BUILDING CODE
A.B.	ANCHOR BOLT	CONC.	CONCRETE	ELEV.	ELEVATOR	F.O.S.	FACE OF STUDS			NAT.	NATURAL			SIM.	SIMILAR	U.N.O.	UNLESS NOTED OTHERWISE
ABV.	ABOVE	CONF.	CONFERENCE	EMER.	EMERGENCY	F.O.S.F.	FACE OF STORE-FRONT	K.D.	KILN-DRIED	N.I.C.	NOT IN CONTRACT	P.S.I.	POUND PER SQUARE INCH	SKLT.	SKYLIGHT		
A/C	AIR CONDITIONING	CONN.	CONNECT(ION)	ENCL.	ENCLOSURE	F.O.W.	FACE OF WALL	K.P.	KICK PLATE	NO.	NUMBER	PT.	POINT	SMACNA	SHEET METAL & A/C CONTRACTORS NATL ASSOC.	UR.	URINAL
A.C.	ASPHALTIC CONCRETE	CONST.	CONSTRUCT(ION)	ENGR.	ENGINEER	F.P.	FIREPLACE			NOM.	NOMINAL	P.T.	PRESSURE TREATED				
ACOUS.	ACOUSTIC(AL)	CONT.	CONTINUOUS	EQ.	EQUAL	F.S.R.	FIRE SPRINKLER RISER	LAB.	LABORATORY	N.T.S.	NOT TO SCALE	PTD.	PAINTED	S.N.D.	SANITARY NAPKIN DISPENSER	V.B.	VAPOR BARRIER
ADJ.	ADJUSTABLE	CONTR.	CONTRACTOR	EQPT.	EQUIPMENT	FT.	FOOT/FEET	LAM.	LAMINATE					S.N.R.	SANITARY NAPKIN RECEPTACLE	VERT.	VERTICAL
A.F.F.	ABOVE FINISH FLOOR	COORD.	COORDINATE	EXH.	EXHAUST	FTG.	FOOTING	LAV.	LAVATORY	O/	OVER	QTR.	QUARTER			VEST.	VESTIBULE
AGG.	AGGREGATE	CORR.	CORRIDOR	EXP.	EXPOSED	FURR.	FURRING	LB.	POUND	OBS.	OBSCURE			S & R	SHELF AND ROD	V.G.	VERTICAL GRAIN
AL.	ALUMINUM	C.T.	CERAMIC TILE	EXT.	EXTERIOR			L.H.	LEFT HAND	O.C.	ON CENTER	R.	RISER	SPEC.	SPECIFICATION	V.T.	VINYL TILE
ANOD.	ANODIZED	CTR.	CENTER	F.A.	FIRE ALARM	GA.	GAUGE	L.L.	LIVE LOAD	O.D.	OUTSIDE DIAMETER	RAD.	RADIUS	S.S.	SERVICE SINK		
APPROX.	APPROXIMATE	CTSK.	COUNTERSINK	FAB.	FABRICATE	GALV.	GALVANIZE	LT(G).	LIGHT(ING)	O.F.C.I.	OWNER FURNISHED CONTRACTOR INSTALLED	R.D.	ROOF DRAIN	S.ST.	STAINLESS STEEL	W/	WITH
ASPH.	ASPHALT(IC)	CU.	CUBIC.	F.A.U.	FORCED AIR UNIT	G.B.	GRAB BAR	LVR.	LOUVER			REC.	RECESSED	STAG.	STAGGERED	W.C.	WATER CLOSET
AUTO.	AUTOMATIC	CUR.	CURTAIN	F.B.O.	FURNISHED BY OTHERS	G.D.	GARBAGE DISPOSAL			OFF.	OFFICE	RECEP.	RECEPTACLE	S.T.C.	SOUND TRANSMISSION COEFFICIENT	WDW.	WINDOW
		C.W.	COLD WATER	F.D.	FLOOR DRAIN	G.I.	GALVANIZED IRON	M.A.	MASONRY ANCHOR	O.H.	OVERHEAD	REF.	REFRIGERATOR			W.GL.	WIRE GLASS
BD.	BOARD			FDN.	FOUNDATION	GL.	GLASS/GLAZING	MAS.	MASONRY	OPNG.	OPENING	REINF.	REINFORCING	STD.	STANDARD	W.H.	WATER HEATER
BLDG.	BUILDING	DBL.	DOUBLE	F.E.	FIRE EXTINGUISHER	GLU-LAM	GLUE-LAMINATED	MATL.	MATERIAL	OPP.	OPPOSITE	REQD.	REQUIRED	STL.	STEEL	W.I.	WROUGHT IRON
BLK(G).	BLOCK(ING)	DEMO.	DEMOLITION	F.E.C.	FIRE EXTINGUISHER CABINET	G.WB.	GYPSUM WALLBOARD	MAX.	MAXIMUM	O.R.D.	OVERFLOW ROOF DRAIN	RESIL.	RESILIENT	STOR.	STORAGE	W/O	WITHOUT
BLW.	BELOW	D.F.	DRINKING FOUNTAIN	F.F.	FINISH FLOOR	H.B.	HOSE BIBB	M.B.	MACHINE BOLT			RESN.	RESAWN	STRL.	STRUCTURAL	W.O.	WHERE OCCURS
BM.	BEAM	D.F./L	DOUGLAS FIR/ LARCH	F.G.	FIXED GLASS	H.C.	HOLLOW CORE	MDO.	MEDIUM DENSITY OVERLAY	PART.	PARTITION	RET.	RETURN	SUB'FLR.	SUBFLOOR	W.P.	WATERPROOF
B.O.	BOTTOM OF OR BACK OF	DIA.	DIAMETER	F.H.	FIRE HYDRANT	HDWR.	HARDWARE	MECH.	MECHANICAL	P.B.	PROTECTION BOARD	REV.	REVISION	SUSP.	SUSPENDED	W.R.	WASTE RECEPTACLE
BRK.	BREAK	DIAG.	DIAGONAL	F.H.C.	FIRE HOSE CABINET	HORZ.	HORIZONTAL	MEMB.	MEMBRANE	P.C.P.	PORTLAND CEMENT PLASTER	R.H.	RIGHT HAND	S.V.	SHEET VINYL	W.S.	WOOD SCREW
B.U.R.	BUILT UP ROOF	DIM.	DIMENSION	F.H.S.	FLAT HEAD SCREW	HR.	HOUR	MEZZ.	MEZZANINE			RM.	ROOM			WT.	WEIGHT
		D.L.	DEAD LOAD	FIN.	FINISH	HT.	HEIGHT	MFR.	MANUFACTURE(R)	P.D.F.	POWER DRIVEN FASTENER	RND.	ROUND	T.	TREAD	W.W.F.	WELDED WIRE FABRIC
CAB.	CABINET	DN.	DOWN	FIX.	FIXTURE	H.V.A.C.	HEATING, VENTILATING AND AIR CONDITIONING	MIN.	MINIMUM			R.O.	ROUGH OPENING	T-24	CALIFORNIA TITLE-24		
CEM.	CEMENT	DR.	DOOR	FL.	FLUSH			MIR.	MIRROR	PERF.	PERFORATED	R.O.W.	RIGHT OF WAY	T&B	TOP AND BOTTOM	YD.	YARD
		D.S.	DOWNSPOUT	F.R.P.	FIBERGLASS REINFORCED PANEL	H.W.	HOT WATER	MISC.	MISCELLANEOUS	PERM.	PERMANENT	RSN.	ROUGH SAWN	TEL.	TELEPHONE		
								MIX.	MIXTURE	PERP.	PERPENDICULAR	RT.	RIGHT	TEMP.	TEMPERED	ZN.	ZINC
								M.O.	MASONRY OPENING	PL.	PLACE	RWD.	REDWOOD	T&G	TONGUE AND GROOVE		
												R.W.L.	RAIN WATER LEADER	THRU.	THROUGH		

SYMBOLS

- NORTH SYMBOL
- DOOR NUMBER
- WINDOW TYPE
- KEYNOTE
- ELEVATION LINE, WORK OR DATUM POINT
- MATCH LINE, (SIDE CONSIDERED IS SHADED)
- GRADE ELEVATION
- COLUMN REFERENCE
- REVISION CLOUD WITH INDICATOR
- DETAIL REFERENCE, (DETAIL # ON TOP, SHEET # ON BOTTOM)
- BUILDING/ WALL SECTION, (SECTION # ON TOP, SHEET # ON BOTTOM)
- EXTERIOR ELEVATION, (ELEVATION # ON TOP, SHEET # ON BOTTOM)
- INTERIOR ELEVATION, ELEVATION # ON TOP, SHEET # ON BOTTOM)
- DIMENSION POINT TO CENTERLINE OF OBJECT
- DIMENSION POINT TO FACE OF MATERIAL
- SLOPE DIRECTION WITH PERCENTAGE RATE
- MAX. OCCUPANCY LOAD
- OCC. LOAD AT POINT OF EXIT W/ EXIT DIRECTION

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JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
1	01/10/24	LANDSCAPING
2	03/22/24	FINISHES
3	07/29/24	ALL ELECTRIC

DATE 12.09.22

DRAWN JDC/DH

JOB NO. 21027

SHEET A0.0 COVER SHEET

OF 15 SHEETS

2019 CALIFORNIA GREEN BUILDING STANDARDS CODE
NONRESIDENTIAL MANDATORY MEASURES, SHEET 1 (January 2020, Includes August 2019 Supplement)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY
ARCH= ARCHITECT, STRC- STRUCTURAL, PLMBG- PLUMBING
MECH- MECHANICAL, ELECT- ELECTRICAL, LNDSC- LANDSCAPE,
CNTR-CONTRACTOR, OWNR- OWNER

Y | N/A | RESPON. PARTY

CHAPTER 3
GREEN BUILDING
SECTION 301 GENERAL

301.1 SCOPE. Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

301.3 NONRESIDENTIAL ADDITIONS AND ALTERATIONS. [BSC-CG] The provisions of individual sections of Chapter 5 apply to newly constructed buildings, building additions of 1,000 square feet or greater, and/or building alterations with a permit valuation of $200,000 or above (for occupancies within the authority of California Building Standards Commission). Code sections relevant to additions and alterations shall only apply to the portions of the building being added or altered within the scope of the permitted work.

A code section will be designated by a banner to indicate where the code section only applies to newly constructed buildings [N] or to additions and/or alterations [A]. When the code section applies to both, no banner will be used.

301.3.1 Nonresidential additions and alterations that cause updates to plumbing fixtures only:

Note: On and after January 1, 2014, certain commercial real property, as defined in Civil Code Section 1101.3, shall have its noncompliant plumbing fixtures replaced with appropriate water-conserving plumbing fixtures under specific circumstances. See Civil Code Section 1101.1 *et seq.* for definitions, types of commercial real property affected, effective dates, circumstances necessitating replacement of noncompliant plumbing fixtures, and duties and responsibilities for ensuring compliance.

301.3.2 Waste Diversion. The requirements of Section 5.408 shall be required for additions and alterations whenever a permit is required for work.

301.4 PUBLIC SCHOOLS AND COMMUNITY COLLEGES. (see GBSC)
301.5 HEALTH FACILITIES. (see GBSC)

SECTION 302 MIXED OCCUPANCY BUILDINGS

302.1 MIXED OCCUPANCY BUILDINGS. In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

SECTION 303 PHASED PROJECTS

303.1 PHASED PROJECTS. For shell buildings and others constructed for future tenant improvements, only those code measures relevant to the building components and systems considered to be new construction (or newly constructed) shall apply.

303.1.1 Initial Tenant improvements. The provisions of this code shall apply only to the initial tenant improvements to a project. Subsequent tenant improvements shall comply with the scoping provisions in Section 301.3 non-residential additions and alterations.

ABBREVIATION DEFINITIONS:

HCD	Department of Housing and Community Development
BSC	California Building Standards Commission
DSA-SS	Division of the State Architect, Structural Safety
OSHPD	Office of Statewide Health Planning and Development
LR	Low Rise
HR	High Rise
AA	Additions and Alterations
N	New

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES

DIVISION 5.1 PLANNING AND DESIGN

SECTION 5.101 GENERAL

5.101.1 SCOPE
The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

SECTION 5.102 DEFINITIONS

5.102.1 DEFINITIONS
The following terms are defined in Chapter 2 *(and are included here for reference)*

CUTOFF LUMINAIRES. Luminaires whose light distribution is such that the candela per 1000 lamp lumens does not numerically exceed 25 (2.5 percent) at an angle of 90 degrees above nadir, and 100 (10 percent) at a vertical angle of 80 degrees above nadir. This applies to all lateral angles around the luminaire.

LOW-EMITTING AND FUEL EFFICIENT VEHICLES.
Eligible vehicles are limited to the following:

1. Zero emission vehicle (ZEV), including neighborhood electric vehicles (NEV), partial zero emission vehicle (PZEV), advanced technology PZEV (AT ZEV) or CNG fueled (original equipment manufacturer only) regulated under Health and Safety Code section 43800 and CCR, Title 13, Sections 1961 and 1962.
2. High-efficiency vehicles, regulated by U.S. EPA, bearing High-Occupancy Vehicle (HOV) car pool lane stickers issued by the Department of Motor Vehicles.

NEIGHBORHOOD ELECTRIC VEHICLE (NEV). A motor vehicle that meets the definition of "low-speed vehicle" either in Section 385.5 of the Vehicle Code or in 49CFR571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

TENANT-OCCUPANTS. Building occupants who inhabit a building during its normal hours of operation as permanent occupants, such as employees, as distinguished from customers and other transient visitors.

VANPOOL VEHICLE. Eligible vehicles are limited to any motor vehicle, other than a motortruck or truck tractor, designed for carrying more than 10 but not more than 15 persons including the driver, which is maintained and used primarily for the nonprofit work-related transportation of adults for the purpose of ridesharing.

Note: Source: Vehicle Code, Division 1, Section 668

ZEV. Any vehicle certified to zero-emission standards.

SECTION 5.106 SITE DEVELOPMENT

Y | N/A | RESPON. PARTY

☐ ■ CIVIL

5.106.1 STORM WATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB LESS THAN ONE ACRE OF LAND. Newly constructed projects and additions which disturb less than one acre of land, and are not part of a larger common plan of development or sale, shall prevent the pollution of storm water runoff from the construction activities through one or more of the following measures:

5.106.1.1 Local ordinance. Comply with a lawfully enacted storm water management and/or erosion control ordinance.

5.106.1.2 Best Management Practices (BMPs). Prevent the loss of soil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMPs.

1. Soil loss BMPs that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Scheduling construction activity during dry weather, when possible.
   b. Preservation of natural features, vegetation, soil, and buffers around surface waters.
   c. Drainage swales or lined ditches to control stormwater flow.
   d. Mulching or hydroseeding to stabilize disturbed soils.
   e. Erosion control to protect slopes.
   f. Protection of storm drain inlets (gravel bags or catch basin inserts).
   g. Perimeter sediment control (perimeter silt fence, fiber rolls).
   h. Sediment trap or sediment basin to retain sediment on site.
   i. Stabilized construction exits.
   j. Wind erosion control.
   k. Other soil loss BMPs acceptable to the enforcing agency.
2. Good housekeeping BMPs to manage construction equipment, materials, non-stormwater discharges and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Dewatering activities.
   b. Material handling and waste management.
   c. Building materials stockpile management.
   d. Management of washout areas (concrete, paints, stucco, etc.).
   e. Control of vehicle/equipment fueling to contractor's staging area.
   f. Vehicle and equipment cleaning performed off site.
   g Spill prevention and control.
   h. Other housekeeping BMPs acceptable to the enforcing agency.

Y | N/A | RESPON. PARTY

☐ ■ CIVIL

5.106.2 STORMWATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB ONE OR MORE ACRES OF LAND. Comply with all lawfully enacted stormwater discharge regulations for projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development sale.

Note: Projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of the larger common plan of development or sale must comply with the post-construction requirements detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board or the Lahontan Regional Water Quality Control Board (for projects in the Lake Tahoe Hydrologic Unit).

The NPDES permits require postconstruction runoff (post-project hydrology) to match the preconstruction runoff (pre-project hydrology) with the installation of postconstruction stormwater management measures. The NPDES permits emphasize runoff reduction through on-site stormwater use, interception, evapotranspiration, and infiltration through nonstructural controls, such as Low Impact Development (LID) practices, and conversation design measures. Stormwater volume that cannot be addressed using nonstructural practices is required to be captured in structural practices and be approved by the enforcing agency.

Refer to the current applicable permits on the State Water Resources Control Board website at: www.waterboards.ca.gov/constructionstormwater. Consideration to the stormwater runoff management measures should be given during the initial design process for appropriate integration into site development.

☐ ■ ARCH

5.106.4 BICYCLE PARKING. For buildings within the authority of California Building Standards Commission as specified in Section 103, comply with Section 5.106.4.1. For buildings within the authority of the Division of the State Architect pursuant to Section 105, comply with Section 5.106.4.2

5.106.4.1 Bicycle parking. [BSC-CG] Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter.

5.106.4.1.1 Short-term bicycle parking. If the new project or an addition or alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5% of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack.
Exception: Additions or alterations which add nine or less visitor vehicular parking spaces.

5.106.4.1.2 Long-term bicycle parking. For new buildings with tenant spaces that have 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility.

5.106.4.1.3 For additions or alterations that add 10 or more tenant-occupant vehicular parking spaces, provide secure bicycle parking for 5 percent of the tenant vehicular parking spaces being added, with a minimum of one bicycle parking facility.

5.106.4.1.4 For new shell buildings in phased projects provide secure bicycle parking for 5 percent of the anticipated tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility.

5.106.4.1.5 Acceptable bicycle parking facility for Sections 5.106.4.1.2, 5.106.4.1.3, and 5.106.4.1.4 shall be convenient from the street and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

Note: Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

5.106.4.2 Bicycle parking. [DSA-SS] For public schools and community colleges, comply with Sections 5.106.4.2.1 and 5.106.4.2.2

5.106.4.2.1 Student bicycle parking. Provide permanently anchored bicycle racks conveniently accessed with a minimum of four two-bike capacity racks per new building.
5.106.4.2.2 Staff bicycle parking. Provide permanent, secure bicycle parking conveniently accessed with a minimum of two staff bicycle parking spaces per new building. Acceptable bicycle parking facilities shall be convenient from the street or staff parking area and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

☐ ■ ARCH

5.106.5.2 DESIGNATED PARKING FOR CLEAN AIR VEHICLES. In new projects or additions or alterations that add 10 or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as follows:

TABLE 5.106.5.2 - PARKING

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES
0-9	0
10-25	1
25-50	3
51-75	6
76-100	8
101-150	11
151-200	16
201 AND OVER	AT LEAST 8% OF TOTAL

5.106.5.2.1 - Parking stall marking. Paint, in the paint used for stall striping, the following characters such that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle: CLEAN AIR / VAN POOL / EV

Note: Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces.

☐ ■ ARCH

5.106.5.3 Electric vehicle (EV) charging. [N] Construction shall comply with Section 5.106.5.3.1 or Section 5.106.5.3.2 to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code*, the *California Electrical Code* and as follows:

5.106.5.3.1 Single charging space requirements. [N] When only a single charging space is required per Table 5.106.5.3.3, a raceway is required to be installed at the time of construction and shall be installed in accordance with the *California Electrical Code*. Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. A listed raceway capable of accommodating a 208/240 -volt dedicated branch circuit.
3. The raceway shall not be less than trade size 1".
4. The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and listed suitable cabinet, box, enclosure or equivalent.
5. The service panel or subpanel shall have sufficient capacity to accommodate a minimum 40-ampere dedicated branch circuit for the future installation of the EVSE.

5.106.5.3.2 Multiple charging space requirements. [N] When multiple charging spaces are required per Table 5.106.5.3.3 raceway(s) is/are required to be installed at the time of construction and shall be installed in accordance with the *California Electrical Code*. Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. The raceway(s) shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into listed suitable cabinet(s), box(es), enclosure(s) or equivalent.
3. Plan design shall be based upon 40-ampere minimum branch circuits.
4. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage.
5. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

5.106.5.3.3 EV charging space calculations. [N] Table 5.106.5.3.3 shall be used to determine if single or multiple charging space requirements apply for the future installation of EVSE.

Exceptions: On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

Y | N/A | RESPON. PARTY

1. Where there is insufficient electrical supply.
2. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.

TABLE 5.106.5.3.3

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES
0-9	0
10-25	1
26-50	2
51-75	4
76-100	5
101-150	7
151-200	10
201 AND OVER	6% of total[1]

1. Calculation for spaces shall be rounded up to the nearest whole number.

5.106.5.3.4 [N] Identification. The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective device space(s) for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE".

5.106.5.3.5 [N] Future charging spaces qualify as designated parking as described in Section 5.106.5.2 Designated parking for clean air vehicles.

■ ☐ ELECT

5.106.8 LIGHT POLLUTION REDUCTION. [N].I Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the California Energy Code for Lighting Zones 0-4 as defined in Chapter 10, Section 10-114 of the California Administrative Code; and
2. Backlight (B) ratings as defined in IES TM-15-11 (shown in Table A-1 in Chapter 8);
3. Uplight and Glare ratings as defined in California Energy Code (shown in Tables 130.2-A and 130.2-B in Chapter 8) and
4. Allowable BUG ratings not exceeding those shown in Table 5.106.8, [N] or Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

Exceptions: [N]

1. Luminaires that qualify as exceptions in Section 140.7 of the California Energy Code.
2. Emergency lighting.
3. Building facade meeting the requirements in Table 140.7-B of the California Energy Code, Part 6.
4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.

Note: [N]
1. See also California Building Code, Chapter 12, Section 1205.6 for college campus lighting requirements for parking facilities and walkways.
2. Refer to Chapter 8 (Compliance Forms, Worksheets and Reference Material) for IES TM-15-11 Table A-1, California Energy Code Tables 130.2-A and 130.2-B.
3. Refer to the California Building Code for requirements for additions and alterations.

TABLE 5.106.8 [N] MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS[1,2]

ALLOWABLE RATING	LIGHTING ZONE LZ0	LIGHTING ZONE LZ1	LIGHTING ZONE LZ2	LIGHTING ZONE LZ3	LIGHTING ZONE LZ4
MAXIMUM ALLOWABLE BACKLIGHT RATING [3]					
Luminaire greater than 2 mounting heights (MH) from property line	N/A	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1-2 MH from property line	N/A	B2	B3	B4	B4
Luminaire back hemisphere is 0.5-1 MH from property line	N/A	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	N/A	B0	B0	B1	B2
MAXIMUM ALLOWABLE UPLIGHT RATING (U)					
For area lighting [4]	N/A	U0	U0	U0	U0
For all other outdoor lighting,including decorative luminaires	N/A	U1	U2	U3	UR
MAXIMUM ALLOWABLE GLARE RATING [3] **(G)**					
Luminaire greater than 2 MH from property line	N/A	G1	G2	G3	G4
Luminaire front hemisphere is 1-2 MH from property line	N/A	G0	G1	G1	G2
Luminaire front hemisphere is 0.5-1 MH from property line	N/A	G0	G0	G1	G1
Luminaire back hemisphere is less than 0.5 MH from property line	N/A	G0	G0	G0	G1

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code.*

2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.

3. If the nearest property line is less than or equal to two mounting heights from the back hemisphere of the luminaire distribution, the applicable reduced Backlight rating shall be met.

4. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaires located in these areas shall meet *U*-value limits for "all other outdoor lighting".

5. If the nearest property line is less than or equal to two mounting heights from the front hemisphere of the luminaire distribution, the applicable reduced Glare rating shall be met.

☐ ■ CIVIL

5.106.10 GRADING AND PAVING. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales.
2. Water collection and disposal systems.
3. French drains.
4. Water retention gardens.
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

Exception: Additions and alterations not altering the drainage path.

Y | N/A | RESPON. PARTY

☐ ■ LNDSC

5.106.12 SHADE TREES [DSA-SS]. Shade Trees shall be planted to comply with Sections 5.106.12.1, 5.106.12.2, and 5.106.12.3. Percentages shown shall be measured at noon on the summer solstice. Landscape irrigation necessary to establish and maintain tree health shall comply with Section 5.304.6.

5.106.12.1 Surface parking areas. Shade tree plantings, minimum #10 container size or equal, shall be installed to provide shade over 50 percent of the parking area within 15 years.

Exceptions: The surface parking area covered by solar photovoltaic shade structures, or shade structures, with roofing materials that comply with Table A5.106.11.2.2 in Appendix A5, are not included in the total area calculations.

5.106.12.2 Landscape areas. Shade tress plantings, minimum #10 container size or equal shall be installed to provide shade of 20% of the landscape area within 15 years.

Exceptions: Playfields for organized sport activity are not included in the total area calculation.

5.106.12.3. Hardscape areas. Shade tree plantings, minimum #10 container size or equal shall be installed to provide shade over 20 percent of the hardscape area within 15 years.

Exceptions: Walks, hardscape areas covered by solar photovoltaic shade structures, and hardscape areas covered by shade structures with roofing materials that comply with Table A5.106.11.2.2 in Appendix A5, are not included in the total area calculation.

DIVISION 5.2 ENERGY EFFICIENCY

SECTION 5.201 GENERAL

5.201.1 Scope [BSC-CG]. ***California Energy Code [DSA-SS].*** For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.

DIVISION 5.3 WATER EFFICIENCY AND CONSERVATION

SECTION 5.301 GENERAL

5.301.1 Scope. The provisions of this chapter shall establish the means of conserving water use indoors, outdoors and in wastewater conveyance.

SECTION 5.302 DEFINITIONS

5.302.1 Definitions. The following terms are defined in Chapter 2 *(and are included here for reference)*

EVAPOTRANSPIRATION ADJUSTMENT FACTOR (ETAF) [DSA-SS]. An adjustment factor when applied to reference evapotranspiration that adjusts for plant factors and irrigation efficiency, which ae two major influences on the amount of water that needs to be applied to the landscape.

FOOTPRINT AREA [DSA-SS]. The total area of the furthest exterior wall of the structure projected to natural grade, not including exterior areas such as stairs, covered walkways, patios and decks.

METERING FAUCET. A self-closing faucet that dispenses a specific volume of water for each actuation cycle. The volume or cycle duration can be fixed or adjustable.

GRAYWATER. Pursuant to Health and Safety Code Section 17922.12, "graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes, but is not limited to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines and laundry tubs, but does not include waste water from kitchen sinks or dishwashers.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). The California ordinance regulating landscape design, installation and maintenance practices that will ensure commercial, multifamily and other developer installed landscapes greater than 2500 square feet meet an irrigation water budget developed based on landscaped area and climatological parameters.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). [HCD] The California model ordinance (California Code of Regulations, Title 23, Division 2, Chapter 2.7), regulating landscape design, installation and maintenance practices. Local agencies are required to adopt the updated MWELO, or adopt a local ordinance at least as effective as the MWELO.

POTABLE WATER. Water that is drinkable and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards. See definition in the California Plumbing Code, Part 5.

POTABLE WATER. [HCD] Water that is satisfactory for drinking, culinary, and domestic purposes, and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards and the requirements of the Health Authority Having Jurisdiction.

RECYCLED WATER. Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur [Water Code Section 13050 (n)]. Simply put, recycled water is water treated to remove waste matter attaining a quality that is suitable to use the water again.

SUBMETER. A meter installed subordinate to a site meter. Usually used to measure water intended for one purpose, such as landscape irrigation. For the purposes of CALGreen, a dedicated meter may be considered a submeter.

WATER BUDGET. Is the estimated total landscape irrigation water use which shall not exceed the maximum applied water allowance calculated in accordance with the Department of Water Resources Model Efficient Landscape Ordinance (MWELO).

SECTION 5.303 INDOOR WATER USE

5.303.1 METERS. Separate submeters or metering devices shall be installed for the uses described in Sections 503.1.1 and 503.1.2.

5.303.1.1 Buildings in excess of 50,000 square feet. Separate submeters shall be installed as follows:

1. For each individual leased, rented or other tenant space within the building projected to consume more than 100 gal/day (380 L/day), including, but not limited to, spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop.
2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
   a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).
   b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
   c. Steam and hot water boilers with energy input more than 500,000 Btu/h (147 kW).

5.303.1.2 Excess consumption. A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day.

☐ ■ PLMBG

5.303.3 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:

5.303.3.1 Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-Type toilets.

Note: The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

5.303.3.2 Urinals.
5.303.3.2.1 Wall-mounted Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush.

5.303.3.2.2 Floor-mounted Urinals. The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush.

5.303.3.3 Showerheads. [BSC-CG]
5.303.3.3.1 Single showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

5.303.3.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all the showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time.
Note: A hand-held shower shall be considered a showerhead.

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JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
1	01/10/24	LANDSCAPING
2	03/22/24	FINISHES

DATE 12.09.22
DRAWN JDC/DH
JOB NO. 21027
SHEET A0.1A
CAL-GREEN 1 OF 3
OF 15 SHEETS

DISCLAIMER: *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE 2016 CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

2019 CALIFORNIA GREEN BUILDING STANDARDS CODE
NONRESIDENTIAL MANDATORY MEASURES, SHEET 1 (January 2020, Includes August 2019 Supplement)

AIA California

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY
ARCH= ARCHITECT, STRC- STRUCTURAL, PLMBG- PLUMBING
MECH- MECHANICAL, ELECT- ELECTRICAL, LNDSC- LANDSCAPE,
CNTR-CONTRACTOR, OWNR- OWNER

Y	N/A	RESPON. PARTY	

5.303.3.4 Faucets and fountains.

5.303.3.4.1 Nonresidential Lavatory faucets. Lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi.

5.303.3.4.2 Kitchen faucets. Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

5.303.3.4.3 Wash fountains. Wash fountains shall have a maximum flow rate of not more than1.8 gallons per minute/20 [rim space (inches) at 60 psi].

5.303.3.4.4 Metering faucets. Metering faucets shall not deliver more than 0.20 gallons per cycle.

5.303.3.4.5 Metering faucets for wash fountains. Metering faucets for wash fountains shall have a maximum flow rate of not more than 0.20 gallons per minute/20 [rim space (inches) at 60 psi].

Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

☐ ■ PLMBG **5.303.4 COMMERCIAL KITCHEN EQUIPMENT.**

5.303.4.1 Food Waste Disposers. Disposers shall either modulate the use of water to no more than 1 gpm when the disposer is not in use (not actively grinding food waste/no-load) or shall automatically shut off after no more than 10 minutes of inactivity. Disposers shall use no more than 8 gpm of water.
Note: This code section does not affect local jurisdiction authority to prohibit or require disposer installation.

☐ ■ PLMBG **5.303.5 AREAS OF ADDITION OR ALTERATION.** For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Section 5.303.3 and 5.303.4 shall apply to new fixtures in additions or areas of alteration to the building.

■ ☐ PLMBG **5.303.6 STANDARDS FOR PLUMBING FIXTURES AND FITTINGS.** Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code*, and shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code* and in Chapter 6 of this code.

SECTION 5.304 OUTDOOR WATER USE

☐ ■ LNDSC **5.304.1 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS.** Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.

Notes:
1. The Model Water Efficient Landscape Ordinance (MWELO) is located in the California Code of Regulations, Title 23, Chapter 2.7, Division 2.
2. MWELO and supporting documents, including a water budget calculator, are available at: https://www.water.ca.gov/.

☐ ■ LNDSC **5.304.6 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS.** For public schools and community colleges, landscape projects as described in Sections 5.304.6.1 and 5.304.6.2 shall comply with the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, California Code of Regulations, except that the evapotranspiration adjustment factor (ETAF) shall be 0.65 with an additional water allowance for special landscape areas (SLA) of 0.35.

Exception: Any project with an aggregate landscape area of 2,500 square feet or less may comply with the prescriptive measures contained in Appendix D of the MWELO.

5.304.6.1 Newly constructed landscapes. New construction projects with an aggregate landscape area equal to or greater than 500 square feet.

5.304.6.2 Rehabilitated landscapes. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 1,200 square feet.

DIVISION 5.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION 5.401 GENERAL

5.401.1 SCOPE. The provisions of this chapter shall outline means of achieving material conservation and resource efficiency through protection of buildings from exterior moisture, construction waste diversion, employment of techniques to reduce pollution through recycling of materials, and building commissioning or testing and adjusting.

SECTION 5.402 DEFINITIONS

5.402.1 DEFINITIONS. The following terms are defined in Chapter 2 *(and are included here for reference)*

ADJUST. To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.

BALANCE. To proportion flows within the distribution system, including sub-mains, branches and terminals, according to design quantities.

BUILDING COMMISSIONING. A systematic quality assurance process that spans the entire design and construction process, including verifying and documenting that building systems and components are planned, designed, installed, tested, operated and maintained to meet the owner's project requirements.

ORGANIC WASTE. Food waste, green waste, landscape and pruning wste, nonhazardous wood waste, and food soiled paper waste that is mixed in with food waste.

TEST. A procedure to determine quantitative performance of a system or equipment

Y	N/A	RESPON. PARTY	

SECTION 5.407 WATER RESISTANCE AND MOISTURE MANAGEMENT

5.407.1 WEATHER PROTECTION. Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1402.2 (Weather Protection), manufacturer's installation instructions or local ordinance, whichever is more stringent.

5.407.2 MOISTURE CONTROL. Employ moisture control measures by the following methods.

☐ ■ LNDSC **5.407.2.1 Sprinklers.** Design and maintain landscape irrigation systems to prevent spray on structures.

■ ☐ ARCH **5.407.2.2 Entries and openings**. Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings as follows:

5.407.2.2.1 Exterior door protection. Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent floor and wall finishes within at least 2 feet around and perpendicular to such openings plus at least one of the following:

1. An installed awning at least 4 feet in depth.
2. The door is protected by a roof overhang at least 4 feet in depth.
3. The door is recessed at least 4 feet.
4. Other methods which provide equivalent protection.

5.407.2.2.2 Flashing. Install flashings integrated with a drainage plane.

SECTION 5.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

5.408.1 CONSTRUCTION WASTE MANAGEMENT. Recycle and/or salvage for reuse a minimum of 65% of the non-hazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

5.408.1.1 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan that:

1. Identifies the construction and demolition waste materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Determines if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
3. Identifies diversion facilities where construction and demolition waste material collected will be taken.
4. Specifies that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

5.408.1.2 Waste Management Company. Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with this section.

Note: The owner or contractor shall make the determination if the construction and demolition waste material will be diverted by a waste management company.

Exceptions to Sections 5.408.1.1 and 5.408.1.2:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.
3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets.

5.408.1.3 Waste stream reduction alternative. The combined weight of new construction disposal that does not exceed two pounds per square foot of building area may be deemed to meet the 65% minimum requirement as approved by the enforcing agency.

5.408.1.4 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with Sections 5.408.1.1, through 5.408.1.3. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

Notes:

1. Sample forms found in "A Guide to the California Green Building Standards Code (Nonresidential)" located at www.bsc.ca.gov/Home/CALGreen.aspx may be used to assist in documenting compliance with the waste management plan.
2. Mixed construction and demolition debris processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

■ ☐ CNTR **5.408.2 UNIVERSAL WASTE. [A]** Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. A list of prohibited Universal Waste materials shall be included in the construction documents.

Note: Refer to the Universal Waste Rule link at: http://www.dtsc.ca.gov/LawsRegsPolicies/Regs/upload/OEAR-A_REGS_UWR_FinalText.pdf

■ ☐ CIVIL **5.408.3 EXCAVATED SOIL AND LAND CLEARING DEBRIS.** 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

Exception: Reuse, either on or off-site, of vegetation or soil contaminated by disease or pest infestation.

Notes:

1. If contamination by disease or pest infestation is suspected, contact the County Agricultural Commissioner and follow its direction for recycling or disposal of the material.
2. For a map of know pest and/or disease quarantine zones, consult with the California Department of Food and Agriculture. (www.cdfa.ca.gov)

SECTION 5.410 BUILDING MAINTENANCE AND OPERATIONS

■ ☐ ARCH **5.410.1 RECYCLING BY OCCUPANTS.** Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

Exception: Rural jurisdictions that meet and apply for the exemption in Public Resources Code 42649.82 (a)(2)(A) et seq. shall also be exempt from the organic waste portion of this section.

5.410.1.1 Additions. All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30% or more in floor area, shall provide recycling areas on site.

Exception: Additions within a tenant space resulting in less than a 30% increase in the tenant space floor area.

5.410.1.2 Sample ordinance. Space allocation for recycling areas shall comply with Chapter 18, Part 3, Division 30 of the *Public Resources Code*. Chapter 18 is known as the California Solid Waste Reuse and Recycling Access Act of 1991 (Act).

Note: A sample ordinance for use by local agencies may be found in Appendix A of the document at the CalRecycle's web site.

Y	N/A	RESPON. PARTY	
☐	■	MECH	

5.410.2 COMMISSIONING. [N] New buildings 10,000 square feet and over. For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. For I-occupancies that are not regulated by OSHPD or for I-occupancies and L-occupancies that are not regulated y the California Energy Code Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Note: For energy-related systems under the scope (Section 100) of the California Energy Code, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting systems and controls, as well as water heating systems and controls, refer to California Energy Code Section 120.8 for commissioning requirements

Commissioning requirements shall include:

1. Owner's or Owner representative's project requirements.
2. Basis of design.
3. Commissioning measures shown in the construction documents.
4. Commissioning plan.
5. Functional performance testing.
6. Documentation and training.
7. Commissioning report.

Exceptions:

1. Unconditioned warehouses of any size.
2. Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.
3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1.
4. Open parking garages of any size, or open parking garage areas, of any size, within a structure.

Note: For the purposes of this section, unconditioned shall mean a building, area, or room which does not provide heating and or air conditioning.

Informational Notes:

1. IAS AC 476 is an accreditation criteria for organizations providing training and/or certification of commissioning personnel. AC 476 is available to the Authority Having Jurisdiction as a reference for qualifications of commissioning personnel. AC 476 des not certify individuals to conduct functional performance tests or to adjust and balance systems.

2. Functional performance testing for heating, ventilation, air conditioning systems and lighting controls must be performed in compliance with the *California Energy Code*.

5.410.2.1 Owner's or Owner Representative's Project Requirements (OPR). [N] The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:
1. Environmental and sustainability goals.
2. Building sustainable goals.
3. Indoor environmental quality requirements.
4. Project program, including facility functions and hours of operation, and need for after hours operation.
5. Equipment and systems expectations.
6. Building occupant and operation and maintenance (O&M) personnel expectations.

5.410.2.2 Basis of Design (BOD). [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design document shall cover the following systems:

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse system.

5.410.2.3 Commissioning plan. [N] Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned. The commissioning plan shall include the following:
1. General project information.
2. Commissioning goals.
3. Systems to be commissioned. Plans to test systems and components shall include:
   a. An explanation of the original design intent.
   b. Equipment and systems to be tested, including the extent of tests.
   c. Functions to be tested.
   d. Conditions under which the test shall be performed.
   e. Measurable criteria for acceptable performance.
4. Commissioning team information.
5. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included.

5.410.2.4 Functional performance testing. [N] Functional performance tests shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

5.410.2.5 Documentation and training. [N] A Systems Manual and Systems Operations Training are required, including Occupational Safety and Health Act (OSHA) requirements in *California Code of Regulations* (CCR), Title 8, Section 5142, and other related regulations.

5.410.2.5.1 Systems manual. [N] Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative. The systems manual shall include the following:
1. Site information, including facility description, history and current requirements.
2. Site contact information.
3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log.
4. Major systems.
5. Site equipment inventory and maintenance notes.
6. A copy of verifications required by the enforcing agency or this code.
7. Other resources and documentation, if applicable.

5.410.2.5.2 Systems operations training. [N] A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and shall include the following:
1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).
2. Review and demonstration of servicing/preventive maintenance.
3. Review of the information in the Systems Manual.
4. Review of the record drawings on the system/equipment.

5.410.2.6 Commissioning report. [N] A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.

Y	N/A	RESPON. PARTY	
■	☐	MECH	

5.410.4 TESTING AND ADJUSTING. New buildings less than 10,000 square feet. Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1.

5.410.4.2 (Reserved)

Note: For energy-related systems under the scope (Section 100) of the California Energy Code, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting system and controls, as well as water heating systems and controls, refer to California Energy Code Section 120.8 for commissioning requirements and Sections 120.5, 120.6, 130.4, and 140.9(b)3 for additional testing requirements of specific systems.

5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include at a minimum, as applicable to the project:

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse systems.

5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with manufacturer's specifications and applicable standards on each system.

5.410.4.3.1 HVAC balancing. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

Y	N/A	RESPON. PARTY	

5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

5.410.4.5 Operation and maintenance (O & M) manual. Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/warranties for each system. O & M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

5.410.4.5.1 Inspections and reports. Include a copy of all inspection verifications and reports required by the enforcing agency.

DIVISION 5.5 ENVIRONMENTAL QUALITY

SECTION 5.501 GENERAL

5.501.1 SCOPE. The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors.

SECTION 5.502 DEFINITIONS

5.502.1 DEFINITIONS. The following terms are defined in Chapter 2 *(and are included here for reference)*

ARTERIAL HIGHWAY. A general term denoting a highway primarily for through traffic usually on a continuous route.

A-WEIGHTED SOUND LEVEL (dBA). The sound pressure level in decibels as measured on a sound level meter using the internationally standardized A-weighting filter or as computed from sound spectral data to which A-weighting adjustments have been made.

1 BTU/HOUR. British thermal units per hour, also referred to as Btu. The amount of heat required to raise one pound of water one degree Fahrenheit per hour, a common measure of heat transfer rate. A ton of refrigeration is 12,000 Btu, the amount of heat required to melt a ton (2,000 pounds) of ice at 32^0 Fahrenheit.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL). A metric similar to the day-night average sound level (Ldn), except that a 5 decibel adjustment is added to the equivalent continuous sound exposure level for evening hours (7pm to 10pm) in addition to the 10 dB nighttime adjustment used in the Ldn.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. "Composite wood products" does not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, timber, prefabricated wood I–joists or finger–jointed lumber, all as specified in California Code of Regulations (CCR), Title 17, Section 93120.1(a).

Note: See CCR, Title 17, Section 93120.1.

DAY-NIGHT AVERAGE SOUND LEVEL (Ldn). The A-weighted equivalent continuous sound exposure level for a 24-hour period with a 10 dB adjustment added to sound levels occurring during nighttime hours (10p.m. to 7 a.m.).

DECIBEL (db). A measure on a logarithmic scale of the magnitude of a particular quantity (such as sound pressure, sound power, sound intensity) with respect to a reference quantity.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered electric vehicles. For purposes of the *California Electrical Code*, off-road, self-propoelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats, and the like, are not included.

ELECTRIC VEHICLE CHARGING STATION(S) (EVCSj). One or more spaces intended for charging electric vehicles.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

ENERGY EQUIVALENT (NOISE) LEVEL (Leq). The level of a steady noise which would have the same energy as the fluctuating noise level integrated over the time of period of interest.

EXPRESSWAY. An arterial highway for through traffic which may have partial control of access, but which may or may not be divided or have grade separations at intersections.

FREEWAY. A divided arterial highway with full control of access and with grade separations at intersections.

GLOBAL WARMING POTENTIAL (GWP). The radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time. Carbon dioxide is the reference compound with a GWP of one.

GLOBAL WARMING POTENTIAL VALUE (GWP VALUE). A 100-year GWP value published by the Intergovernmental Panel on Climate Change (IPCC) in either its Second Assessment Report (SAR) (IPCC, 1995); or its Fourth Assessment A-3 Report (AR4) (IPCC, 2007). The SAR GWP values are found in column "SAR (100-yr)" of Table 2.14., the AR4 GWP values are found in column "100 yr" of Table 2.14.

HIGH-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that is: (a) a chlorofluorocarbon, a hdrochlorofluorocarbon, a hydrofluorocarbon, a perfluorocarbon, or any compound or blend of compounds, with a GWP value equal to or greater than 150, or (B) any ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

LONG RADIUS ELBOW. Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.5 times the pipe diameter.

LOW-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that: (A) has a GWP value less than 150, and (B) is not an ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

MERV. Filter minimum efficiency reporting value, based on ASHRAE 52.2–1999.

MAXIMUM INCREMENTAL REACTIVITY (MIR). The maximum change in weight of ozone formed by adding a compound to the "Base REactive Organic Gas (ROG) Mixture" per weight of compound added, expressed to hundreths of a gram (g O^3/g ROC).

PRODUCT-WEIGHTED MIR (PWMIR). The sum of all weighted-MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).

PSIG. Pounds per square inch, guage.

REACTIVE ORGANIC COMPOUND (ROC). Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.

SCHRADER ACCESS VALVES. Access fittings with a valve core installed.

SHORT RADIUS ELBOW. Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.0 times the pipe diameter.

SUPERMARKET. For the purposes of Section 5.508.2, a supermarket is any retail food facility with 8,000 square feet or more conditioned area, and that utilizes either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units.

VOC. A volatile organic compound broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a)
.

Note: Where specific regulations are cited from different agencies such as SCAQMD, ARB, etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

Y	N/A	RESPON. PARTY	
☐	■	MECH	

SECTION 5.503 FIREPLACES

5.503.1 FIREPLACES. Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace, or a sealed woodstove or pellet stove, and refer to residential requirements in the California Energy Code, Title 24, Part 6, Subchapter 7, Section 150. Woodstoves, pellet stoves and fireplaces shall comply with applicable local ordinances.

5.503.1.1 Woodstoves. Woodstoves and pellet stoves shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits.

SECTION 5.504 POLLUTANT CONTROL

■ ☐ MECH **5.504.1 TEMPORARY VENTILATION.** The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% based on ASHRAE 52.1-1992 Replace all filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction.

■ ☐ MECH **5.504.3 Covering of duct openings and protection of mechanical equipment during construction.** At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilation equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.

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JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
1	01/10/24	LANDSCAPING
2	03/22/24	FINISHES

DATE 12.09.22
DRAWN JDC/DH
JOB NO. 21027
SHEET A0.1B
CAL-GREEN 2 OF 3
OF 15 SHEETS

2019 CALIFORNIA GREEN BUILDING STANDARDS CODE
NONRESIDENTIAL MANDATORY MEASURES, SHEET 1 (January 2020, Includes August 2019 Supplement)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY
ARCH- ARCHITECT, STRC- STRUCTURAL, PLMBG- PLUMBING
MECH- MECHANICAL, ELECT- ELECTRICAL, LNDSC- LANDSCAPE,
CNTR-CONTRACTOR, OWNR- OWNER

Y	N/A	RESPON. PARTY
■	□	CNTR

5.504.4 FINISH MATERIAL POLLUTANT CONTROL. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.

5.504.4.1 Adhesives, sealants and caulks. Adhesives, sealants, and caulks used on the project shall meet the requirements of the following standards:

1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

TABLE 5.504.4.1 - ADHESIVE VOC LIMIT[1,2]

Less Water and Less Exempt Compounds in Grams per Liter

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
INDOOR CARPET ADHESIVES	50
CARPET PAD ADHESIVES	50
OUTDOOR CARPET ADHESIVES	150
WOOD FLOORING ADHESIVES	100
RUBBER FLOOR ADHESIVES	60
SUBFLOOR ADHESIVES	50
CERAMIC TILE ADHESIVES	65
VCT & ASPHALT TILE ADHESIVES	50
DRYWALL & PANEL ADHESIVES	50
COVE BASE ADHESIVES	50
MULTIPURPOSE CONSTRUCTION ADHESIVES	70
STRUCTURAL GLAZING ADHESIVES	100
SINGLE-PLY ROOF MEMBRANE ADHESIVES	250
OTHER ADHESIVES NOT SPECIFICALLY LISTED	50
SPECIALTY APPLICATIONS	
PVC WELDING	510
CPVC WELDING	490
ABS WELDING	325
PLASTIC CEMENT WELDING	250
ADHESIVE PRIMER FOR PLASTIC	550
CONTACT ADHESIVE	80
SPECIAL PURPOSE CONTACT ADHESIVE	250
STRUCTURAL WOOD MEMBER ADHESIVE	140
TOP & TRIM ADHESIVE	250
SUBSTRATE SPECIFIC APPLICATIONS	
METAL TO METAL	30
PLASTIC FOAMS	50
POROUS MATERIAL (EXCEPT WOOD)	50
WOOD	30
FIBERGLASS	80

1. IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.

2. FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168, www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF

TABLE 5.504.4.2 - SEALANT VOC LIMIT

Less Water and Less Exempt Compounds in Grams per Liter

SEALANTS	CURRENT VOC LIMIT
ARCHITECTURAL	250
MARINE DECK	760
NONMEMBRANE ROOF	300
ROADWAY	250
SINGLE-PLY ROOF MEMBRANE	450
OTHER	420
SEALANT PRIMERS	
ARCHITECTURAL	
NONPOROUS	250
POROUS	775
MODIFIED BITUMINOUS	500
MARINE DECK	760
OTHER	750

NOTE: FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THESE TABLES, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168.

5.504.4.3 Paints and coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.

5.504.4.3.1 Aerosol Paints and coatings. Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

Y	N/A	RESPON. PARTY

TABLE 5.504.4.3 - VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2,3]

GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS

COATING CATEGORY	CURRENT VOC LIMIT
FLAT COATINGS	50
NONFLAT COATINGS	100
NONFLAT HIGH GLOSS COATINGS	150
SPECIALTY COATINGS	
ALUMINUM ROOF COATINGS	400
BASEMENT SPECIALTY COATINGS	400
BITUMINOUS ROOF COATINGS	50
BITUMINOUS ROOF PRIMERS	350
BOND BREAKERS	350
CONCRETE CURING COMPOUNDS	350
CONCRETE/MASONRY SEALERS	100
DRIVEWAY SEALERS	50
DRY FOG COATINGS	150
FAUX FINISHING COATINGS	350
FIRE RESISTIVE COATINGS	350
FLOOR COATINGS	100
FORM-RELEASE COMPOUNDS	250
GRAPHIC ARTS COATINGS (SIGN PAINTS)	500
HIGH-TEMPERATURE COATINGS	420
INDUSTRIAL MAINTENANCE COATINGS	250
LOW SOLIDS COATINGS[1]	120
MAGNESITE CEMENT COATINGS	450
MASTIC TEXTURE COATINGS	100
METALLIC PIGMENTED COATINGS	500
MULTICOLOR COATINGS	250
PRETREATMENT WASH PRIMERS	420
PRIMERS, SEALERS, & UNDERCOATERS	100
REACTIVE PENETRATING SEALERS	350
RECYCLED COATINGS	250
ROOF COATINGS	50
RUST PREVENTATIVE COATINGS	250
SHELLACS:	
CLEAR	730
OPAQUE	550
SPECIALTY PRIMERS, SEALERS & UNDERCOATERS	100
STAINS	250
STONE CONSOLIDANTS	450
SWIMMING POOL COATINGS	340
TRAFFIC MARKING COATINGS	100
TUB & TILE REFINISH COATINGS	420
WATERPROOFING MEMBRANES	250
WOOD COATINGS	275
WOOD PRESERVATIVES	350
ZINC-RICH PRIMERS	340

1. GRAMS OF VOC PER LITER OF COATING, INCLUDING WATER & EXEMPT COMPOUNDS

2. THE SPECIFIED LIMITS REMAIN IN EFFECT UNLESS REVISED LIMITS ARE LISTED IN SUBSEQUENT COLUMNS IN THE TABLE.

3. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, FEB. 1, 2008. MORE INFORMATION IS AVAILABLE FROM THE AIR RESOURCES BOARD.

5.504.4.3.2 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturer's product specification
2. Field verification of on-site product containers

5.504.4.4 Carpet Systems. All carpet installed in the building interior shall meet at least one of the testing and product requirements:

1. Carpet and Rug Institute's Green Label Plus Program.
2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, February 2010 (also known as CDPH Standard Method V1.1 or Specification 01350).
3. NSF/ANSI 140 at the Gold level or higher;
4. Scientific Certifications Systems Sustainable Choice; or
5. Compliant with the Collaborative for High Performance Schools California (2014 CA-CHPS) Criteria listed in the CHPS High Performance Product Labease.

5.504.4.4.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.

5.504.4.4.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 5.504.4.1.

5.504.4.5 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure (ATCM) for Composite Wood (17 CCR 93120 et seq.). Those materials not exempted under the ATCM must meet the specified emission limits, as shown in Table 5.504.4.5.

5.504.4.5.3 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:

1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.
5. Other methods acceptable to the enforcing agency.

Y	N/A	RESPON. PARTY
■	□	ARCH
■	□	MECH
■	□	MECH
□	■	MECH
□	■	
■	□	MECH
□	■	MECH

TABLE 5.504.4.5 - FORMALDEHYDE LIMITS[1]

MAXIMUM FORMALDEHYDE EMISSIONS IN PARTS PER MILLION

PRODUCT	CURRENT LIMIT
HARDWOOD PLYWOOD VENEER CORE	0.05
HARDWOOD PLYWOOD COMPOSITE CORE	0.05
PARTICLE BOARD	0.09
MEDIUM DENSITY FIBERBOARD	0.11
THIN MEDIUM DENSITY FIBERBOARD[2]	0.13

1. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, AIR TOXICS CONTROL MEASURE FOR COMPOSITE WOOD AS TESTED IN ACCORDANCE WITH ASTM E 1333. FOR ADDITIONAL INFORMATION, SEE CALIFORNIA CODE OF REGULATIONS, TITLE 17, SECTIONS 93120 THROUGH 93120.12.

2. THIN MEDIUM DENSITY FIBERBOARD HAS A MAXIMUM THICKNESS OF 5/16 INCHES (8 MM).

5.504.4.6 Resilient flooring systems. For 80 percent of floor area receiving resilient flooring, installed resilient flooring shall meet at least one of the following:

1. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program;
2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010;
3. Compliant with the Collaborative for High Performance Schools California (2014 CA-CHPS) Criteria and listed in the CHPS High Performance Product Database; or
4. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children's & Schools Program).

5.504.4.6.1 Verification of compliance. Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.

5.504.5.3 Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a Minimum Efficiency Reporting Value (MERV) of 13. MERV 13 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.

Exceptions: Existing mechanical equipment.

5.504.5.3.1 Labeling. Installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.

5.504.7 ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL. Where outdoor areas are provided for smoking, prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University, or campus of the University of California, whichever are more stringent. When ordinances, regulations or policies are not in place, post signage to inform building occupants of the prohibitions.

SECTION 5.505 INDOOR MOISTURE CONTROL

5.505.1 INDOOR MOISTURE CONTROL. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1202 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures, see Section 5.407.2 of this code.

SECTION 5.506 INDOOR AIR QUALITY

5.506.1 OUTSIDE AIR DELIVERY. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the *California Energy Code*, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.

5.506.2 CARBON DIOXIDE (CO_2) MONITORING. For buildings or additions equipped with demand control ventilation, CO_2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the California Energy Code, Section 120(c)(4).

SECTION 5.507 ENVIRONMENTAL COMFORT

5.507.4 ACOUSTICAL CONTROL. Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E 90 and ASTM E 413, or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E 1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

Exception: Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

Exception: [DSA-SS] For public schools and community colleges, the requirements of this section and all subsections apply only to new construction.

5.507.4.1 Exterior noise transmission, prescriptive method. Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport.

   Exceptions:

   1. L_{dn} or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
   2. L_{dn} or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.

2. Within the 65 CNEL or L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

5.507.4.1.1. Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dB L_{eq} - 1-hr during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

5.507.4.2 Performance Method. For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (Leq-1Hr) of 50 dBA in occupied areas during any hour of operation.

5.507.4.2.1 Site Features. Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.

5.507.4.2.2 Documentation of Compliance. An acoustical analysis documenting complying interior soundlevels shall be prepared by personnel approved by the architect or engineer of record.

5.507.4.3 Interior sound transmission. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.

Note: Examples of assemblies and their various STC ratings may be found at the California Office of Noise Control: www.toolbase.org/PDF/CaseStudies/stc_icc_ratings.pdf.

SECTION 5.508 OUTDOOR AIR QUALITY

5.508.1 Ozone depletion and greenhouse gas reductions. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.

5.508.1.1 Chlorofluorocarbons (CFCs). Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.

5.508.1.2 Halons. Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.

5.508.2 Supermarket refrigerant leak reduction. New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global-warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities.

Exception: Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO_2), and potentially other refrigerants.

Y	N/A	RESPON. PARTY

5.508.2.1 Refrigerant piping. Piping compliant with the California Mechanical Code shall be installed to be accessible for leak protection and repairs. Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than 1/4 inch, flared tubing connections and short radius elbows shall not be used in refrigerant systems except as noted below.

5.508.2.1.1 Threaded pipe. Threaded connections are permitted at the compressor rack.

5.508.2.1.2 Copper pipe. Copper tubing with an OD less than 1/4 inch may be used in systems with a refrigerant charge of 5 pounds or less.

5.508.2.1.2.1 Anchorage. One-fouth-inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.

5.508.2.1.3 Flared tubing connections. Double-flared tubing connections may be used for pressure controls, valve pilot lines and oil.

Exception: Single-flared tubing connections may be used with a multiring seal coated with industrial sealant suitable for use with refrigerants and tightened in accordance with manufacturer's recommendations.

5.508.2.1.4 Elbows. Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.

5.508.2.2 Valves. Valves Valves and fittings shall comply with the *California Mechanical Code* and as follows.

5.508.2.2.1 Pressure relief valves. For vessels containing high-GWP refrigerant, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.

5.508.2.2.1.1 Pressure detection. A pressure gauge, pressure transducer or other device shall be installed in the space between the rupture disc and the relief valve inlet to indicate a disc rupture or discharge of the relief valve.

5.508.2.2.2 Access valves. Only Schrader access valves with a brass or steel body are permitted for use.

5.508.2.2.2.1 Valve caps. For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic.

5.508.2.2.2.2 Seal caps. If designed for it, the cap shall have a neoprene O-ring in place.

5.508.2.2.2.2.1 Chain tethers. Chain tethers to fit ovr the stem are required for valves designed to have seal caps.

Exception: Valves with seal caps that are not removed from the valve during stem operation.

5.508.2.3 Refrigerated service cases. Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of corrosion-resistant material, such as stainless steel; or be coated to prevent corrosion from these substances.

5.508.2.3.1 Coil coating. Consideration shall be given to the heat transfer efficiency of coil coating to maximize energy efficiency.

5.508.2.4 Refrigerant receivers. Refrigerant receivers with capacities greater than 200 pounds shall be fitted with a device tha indicates the level of refrigerant in the receiver.

5.508.2.5 Pressure testing. The system shall be pressure tested during installation prior to evacuation and charging.

5.508.2.5.1 Minimum pressure. The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.

5.508.2.5.2 Leaks. Check the system for leaks, repair any leaks, and retest for pressure using the same gauge.

5.508.2.5.3 Allowable pressure change. The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.

5.508.2.6 Evacuation. The system shall be evacuated after pressure testing and prior to charging.

5.508.2.6.1 First vacuum. Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.

5.508.2.6.2 Second vacuum. Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.

5.508.2.6.3 Third vacuum. Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period.

CHAPTER 7
INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS

702 QUALIFICATIONS

702.1 INSTALLER TRAINING. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. Examples of acceptable HVAC training and certification programs include but are not limited to the following:

1. State certified apprenticeship programs.
2. Public utility training programs.
3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations.
4. Programs sponsored by manufacturing organizations.
5. Other programs acceptable to the enforcing agency.

702.2 SPECIAL INSPECTION [HCD]. When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:

1. Certification by a national or regional green building program or standard publisher.
2. Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.
3. Successful completion of a third party apprentice training program in the appropriate trade.
4. Other programs acceptable to the enforcing agency.

Notes:

1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).

[BSC-CG] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.

Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

703 VERIFICATIONS

703.1 DOCUMENTATION. Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.

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Daniel P. Eriksson
Architect

Kevin L. Wilcox
Architect

LICENSED ARCHITECT DANIEL PAUL ERIKSSON No. C 19641 REN. 7/2025 STATE OF CALIFORNIA

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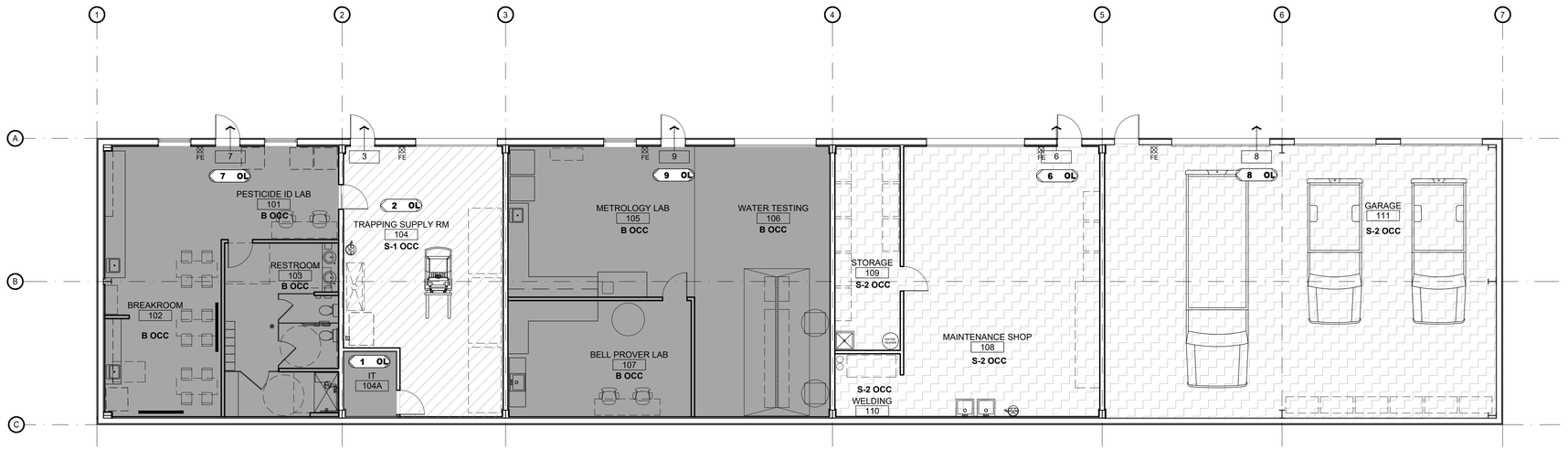
CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
1	01/10/24	LANDSCAPING
2	03/22/24	FINISHES

DATE	12.09.22
DRAWN	JDC/DH
JOB NO.	21027
SHEET	A0.1C
	CAL-GREEN 3 OF 3
OF	15 SHEETS

DISCLAIMER: THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE 2016 CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.



F3 OCCUPANT LOAD & EXITING PLAN

SCALE: 1/8" = 1'-0"

NORTH

OCCUPANT LOAD CALCULATIONS & LEGEND:

# OL	OCCUPANCY LOAD (OCCUPANCY GROUPS VARY AS SHOWN ON PLAN)		
0.0 ↓ DIRECTION OF EXIT	COMBINED OCCUPANT LOAD AT POINT OF EXIT ACCESS		
	S-1 STORAGE OLF	:	1/300 GROSS
	RM 104 AREA: 588 S.F.	=	2 OCCUPANTS
	S-2 PARKING GARAGE OLF	:	1/200 GROSS
	RM 108, RM 109, RM 110 AREA: 1,064 S.F.	=	6 OCCUPANTS
	RM 111 AREA: 1,618 S.F.	=	8 OCCUPANTS
	OFFICE AREA OLF	:	1/150 GROSS
	RM 101, RM 102, RM 103 AREA: 946 S.F.	=	7 OCCUPANTS
	RM 104A AREA: 55 S.F.	=	1 OCCUPANTS
	RM 105, RM 106, RM 107 AREA: 1,295 S.F.	=	9 OCCUPANTS
	TOTAL LOAD	=	32 OCCUPANTS

PLUMBING FIXTURE CALCULATIONS

PLUMBING OCCUPANCY LOAD FACTOR:
1:150 BUSINESS
1:4000 WAREHOUSE STORAGE PORTIONS

OCCUPANCY: B (BUSINESS)
AREA: 2,232 SF
OCCUPANT LOAD = 2,232 SF / 150 OCC. / SF = 15 OCCUPANTS

OCCUPANCY: S-1, S-2 (STORAGE)
AREA: 3,788 S.F.
OCCUPANT LOAD = 3,788 SF / 4000 OCC. /SF = 1 OCCUPANT

16 OCCUPANTS - 8 MEN & 8 WOMEN

REQUIRED
MEN
WATER CLOSET: 1
LAVATORY: 1

WOMEN
WATER CLOSET: 1
LAVATORY: 1

PROVIDED FULL HEIGHT PARTITION UNISEX FACILITIES

LAVATORY:	2
ACCESSIBLE WATER CLOSET:	1
STANDARD WATER CLOSET:	1

PER 2019 CPC 422.2 EXCEPTION 3, WE ARE PROVIDING SINGLE OCCUPANCY FACILITIES.

422.2 EXCEPTION 3: "IN BUSINESS AND MERCANTILE OCCUPANCIES WITH A TOTAL OCCUPANCY LOAD OF 50 OR LESS INCLUDING CUSTOMERS AND EMPLOYEES, ONE TOILET FACILITY, DESIGNED FOR USE BY NO MORE THAN ONE PERSON AT A TIME, SHALL BE PERMITTED FOR USE BY BOTH SEXES."

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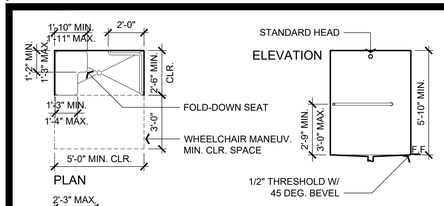
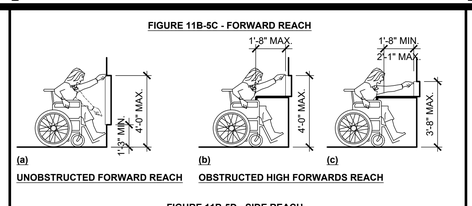


F2 ACCESSIBLE SHOWER

SCALE: 1/4" = 1'-0"

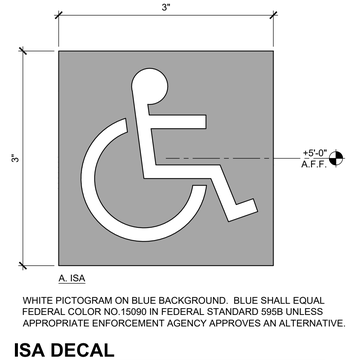
D00000 809



E2 FORWARD AND SIDE REACH

SCALE: 1/4" = 1'-0"

D00000 808

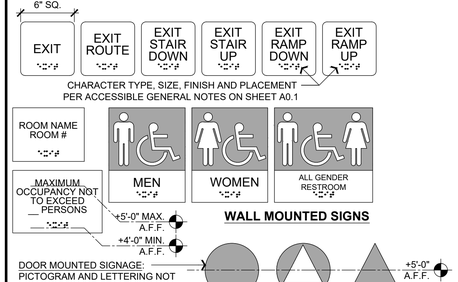


WHITE PICTOGRAM ON BLUE BACKGROUND. BLUE SHALL EQUAL FEDERAL COLOR NO.15090 IN FEDERAL STANDARD 595B UNLESS APPROPRIATE ENFORCEMENT AGENCY APPROVES AN ALTERNATIVE.

D2 ISA DECAL

SCALE: 1:1

D00000 113



C2 WALL AND DOOR MOUNTED SIGNS

SCALE: 1 1/2" = 1'-0"

D00000 810

ACCESSIBILITY GENERAL NOTES

A. RAMPS (INCLUDES ALL APPROACHES TO ANY BUILDING ENTRY):
1. MINIMUM WIDTH 4'-0". IF MAIN ENTRANCE OCCUPANT LOAD IS OVER 300 MIN. WIDTH 5'-0".
2. MAXIMUM SLOPE FOR EXIT RAMPS 8.33% (1:12). MAX. CROSS-SLOPE IS 2% (1:48).
3. 1-1/2" DIA. ROUND PIPE HANDRAILS AT +2'-10", BOTH SIDES OF RAMP ARE REQUIRED ON ALL RAMP SLOPES STEEPER THAN 1:20. ENDS OF HANDRAIL SHALL BE EITHER ROUNDED OR RETURNED SMOOTH TO FLOOR, WALL OR POST AND MUST ALSO EXTEND 12" BEYOND THE END OF THE RAMP.
4. PROVIDE "WHEEL GUIDES" IF RAMP IS OVER 10'-0" LONG AND IS NOT NEXT TO A WALL OR FENCE. PROVIDE 2" HIGH CURB AT EACH SIDE OR A CONTINUOUS BOTTOM RAIL CENTERED AT +3" ABOVE RAMP SURFACE.
5. PROVIDE A 6'-0" LANDING AT EVERY RAMP DIRECTION CHANGE AND AT EVERY 2'-6" OF VERTICAL RISE MAXIMUM. MAX HORIZONTAL RUN FOR SLOPES BETWEEN 8.33% (1:12) TO 6.25% (1:16) OR LESS, IS 30'-0". FOR SLOPES 6.25% (1:16) TO 5% (1:20) OR LESS, IS 40'-0".
6. EXTERIOR RAMPS AND THEIR APPROACHES SHALL NOT ACCUMULATE WATER ON WALKING SURFACES.
7. LANDINGS AT ALL PRIMARY ENTRIES AND EXITS SHALL HAVE A MIN. 6'-6" LANDING WITH A MAX. SLOPE OF 1/4" PER FOOT (2%) IN ANY DIRECTION.

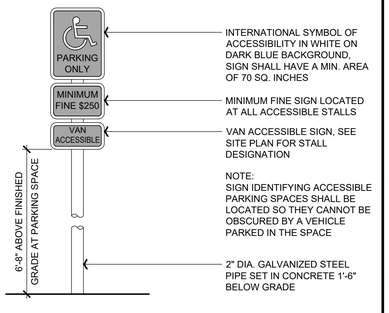
B. EXTERIOR WALKS AND SIDEWALKS:
1. 4'-0" WIDE MIN. CLEAR, NOT INCLUDING VEHICLE OVERHANG.
2. 2% (1:48) PER FOOT CROSS SLOPE MAX.
3. GRATINGS LIMITED TO THOSE WITH 1/2" OPENINGS. IF GRATINGS HAVE ELONGATED OPENINGS, THEN THEY SHALL BE PLACED SO THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT PATH OF TRAVEL.
4. SLOPE IN DIRECTION OF TRAVEL SHALL NOT BE OVER 5% (1:20). FOR SLOPES OVER 5% SEE RAMP NOTES.
5. NO LEVEL CHANGES GREATER THAN 1/2" IN ANY DIRECTION. FOR LEVEL CHANGES BETWEEN 1/4" AND 1/2". EDGE SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 1:2.
6. AT GATES AND SIMILAR CONDITIONS PROVIDE 5'-0" x 5'-0" FLAT AREA (2% OR 1:48 MAX. SLOPE), SEE ACCESSIBLE DOOR STANDARDS.
7. IF ADJACENT SLOPES ARE LESS THAN 5% AND ADJACENT ELEVATION DROP IS LESS THAN 1", WHEEL GUIDES ARE NOT REQUIRED. SEE ACCESSIBLE RAMP NOTES.
8. ALL OBJECTS HANGING OVER ANY WALKS MUST BE HIGHER THAN 6'-8", OBJECTS PROJECTING FROM WALLS WITH LEADING EDGES BETWEEN 2'-3" AND 6'-8" ABOVE FINISH FLOOR SHALL NOT PROTRUDE MORE THAN 4" INTO WALKS. OBJECTS AT OR BELOW 2'-3" MAY PROTRUDE ANY AMOUNT.

C. CONTROLS
1. SINKS REQUIRED TO BE ACCESSIBLE SHALL HAVE FAUCET CONTROLS AND OPERATING MECHANISMS THAT ARE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THAN 5 LBS (22.2N).LEVER-OPERATED, PUSH TYPE AND ELECTRONICALLY CONTROLLED MECHANISMS ARE EXAMPLES OF ACCEPTABLE DESIGNS. SELF-CLOSING VALVES ARE ALLOWED IF THE FAUCET REMAINS OPEN FOR AT LEAST 10 SECONDS.
2. FLUSH CONTROLS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST AND SHALL BE MOUNTED NO MORE THAN 44 INCHES ABOVE THE FLOOR. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THAN 5 LBS (22.2N). ELECTRONIC AUTOMATIC FLUSHING CONTROLS ARE ACCEPTABLE AND PREFERABLE.
3. SEE DETAIL E5/A0.3 FOR MOUNTING HEIGHTS FOR OPERABLE CONTROLS.

D. TACTILE SIGNAGE (GENERALLY):
1. WHERE TACTILE SIGNS ARE REQUIRED, THEY SHALL INCLUDE RAISED LETTERS AND BRAILLE.
2. RAISED CHARACTERS SHALL BE:
   a. RAISED 1/32" ABOVE THEIR BACKGROUND.
   b. UPPERCASE.
   c. SANS SERIF. CHARACTERS SHALL NOT BE ITALIC, OBLIQUE, SCRIPT, HIGHLY DECORATIVE OR OF AN UNUSUAL FORM.
   d. THE WIDTH OF THE LETTER "O" SHALL BE FROM 60% TO 110% OF THE HEIGHT OF THE UPPERCASE LETTER "I".
   e. THE CHARACTERS SHALL BE 5/8" MIN. AND 2" MAXIMUM.
   f. STROKE THICKNESS OF THE UPPERCASE LETTER "I" SHALL BE 15% MAXIMUM OF THE CHARACTER HEIGHT.
   g. WHERE CHARACTERS HAVE RECTANGULAR CROSS SECTION, SPACING BETWEEN INDIVIDUAL CHARACTERS SHALL BE 1/8" MINIMUM AND 4 TIMES THE STROKE WIDTH MAXIMUM. WHERE CHARACTERS HAVE OTHER CROSS SECTION, SPACING BETWEEN INDIVIDUAL CHARACTERS SHALL BE 1/16" MINIMUM AND 4 TIMES THE STROKE WIDTH MAXIMUM AT THE BASE OF THE CROSS SECTION AND 1/8" MINIMUM AND 4 TIMES THE STROKE WIDTH MAXIMUM AT THE TOP OF THE CROSS SECTION. CHARACTERS SHALL BE SEPARATED FROM RAISE BORDERS AND DECORATIVE ELEMENTS BY 3/8" MINIMUM.
   h. SPACING BETWEEN SEPARATE BASELINES OF MULTI-LINE TEXT SHALL BE FROM 135% TO 170% OF THE RAISED CHARACTER HEIGHT.
3. BRAILLE SHALL BE:
   a. CONTRACTED, TYPE II BRAILLE.
   b. THE INDICATION OF AN UPPERCASE LETTER OR LETTERS SHALL ONLY BE USED BEFORE THE FIRST LETTER OF SENTENCES, PROPER NOUNS AND NAMES, INDIVIDUAL LETTERS, INITIALS AND ACRONYMS.
   c. DOTS SHALL HAVE A DOMED OR ROUNDED SHAPE AND SHALL COMPLY WITH TABLE 11B-703.3.1.
   d. POSITIONED BELOW THE ENTIRE TEXT IN A HORIZONTAL FORMAT, EITHER FLUSH LEFT OR CENTERED.
   e. SEPARATED 3/8" MIN. AND 1/2" MAX. FROM OTHER TACTILE CHARACTERS AND 3/8" MIN. FROM OTHER DECORATIVE BORDERS, (BRAILLE ON ELEVATOR CAR CONTROLS SHALL BE SEPARATED 3/16" MINIMUM AND SHALL BE LOCATED DIRECTLY BELOW THE CORRESPONDING RAISED CHARACTER OR SYMBOL).
4. WHEN PRESENT, PICTOGRAMS ARE TO BE ACCOMPANIED BY THE EQUIVALENT WRITTEN DESCRIPTOR PLACED DIRECTLY BELOW THE PICTOGRAM. SEE DETAIL C2/A0.3 FOR REFERENCE.
5. THE OUTSIDE DIMENSION OF THE PICTOGRAM FIELD TO BE 6" MIN. HIGH.
6. TACTILE CHARACTERS ON SIGNS SHALL BE LOCATED 4'-0" MINIMUM ABOVE FINISH FLOOR MEASURED FROM THE BASELINE OF THE LOWEST BRAILLE CELLS AND 5'-0" MAXIMUM ABOVE THE FINISH FLOOR MEASURED FROM THE BASELINE OF THE HIGHEST LINE OF RAISED TEXT.
7. WHERE A TACTILE SIGN IS PROVIDED AT A DOOR, THE SIGN SHALL BE LOCATED ALONGSIDE THE DOOR ON THE LATCH SIDE. AT DOUBLE DOORS, THE SIGN SHALL BE LOCATED ON THE INACTIVE LEAF. WHERE THERE ARE TWO ACTIVE LEAFS, THE SIGN SHALL BE LOCATED TO THE RIGHT SIDE OF THE RIGHT HAND DOOR. WHERE THERE IS NO WALL SPACE AT THE LATCH SIDE OF THE DOOR, SIGNS SHALL BE LOCATED AT THE NEAREST ADJACENT WALL. SIGNS CONTAINING TACTILE CHARACTERS SHALL BE LOCATED SO THAT A CLEAR FLOOR SPACE OF 18" x 18", CENTERED ON THE TACTILE CHARACTERS, IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND THE 45° OPEN POSITION.

E. TACTILE SIGNAGE (EXITS):
1. EACH GRADE LEVEL EXTERIOR DOOR SHALL BE IDENTIFIED BY A TACTILE SIGNAGE WITH THE WORD "EXIT" PER DETAIL C2/A0.3.
2. EACH EXIT DOOR THAT LEADS DIRECTLY TO A GRADE LEVEL EXTERIOR EXIT BY MEANS OF A STAIRWAY OR RAMP SHALL BE IDENTIFIED BY A TACTILE EXIT SIGN WITH THE FOLLOWING WORDS AS APPROPRIATE.
   a. "EXIT STAIR DOWN".
   b. "EXIT RAMP DOWN".
3. EACH EXIT DOOR THAT LEADS DIRECTLY TO A GRADE LEVEL EXTERIOR EXIT BY MEANS OF AN EXIT ENCLOSURE OR AN EXIT PASSAGEWAY SHALL BE IDENTIFIED BY A TACTILE EXIT SIGN WITH THE WORDS 'EXIT ROUTE", SEE DETAIL C2/A0.3 FOR REFERENCE.
4. EACH EXIT ACCESS DOOR FROM AN INTERIOR ROOM OR AREA TO A CORRIDOR OR HALLWAY THAT IS REQUIRED TO HAVE A VISUAL EXIT SIGN, SHALL BE IDENTIFIED BY A TACTILE EXIT SIGN WITH THE WORDS "EXIT ROUTE". SEE DETAIL C2/A0.3 FOR REFERENCE.

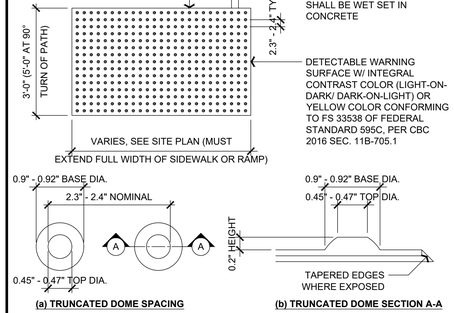
F. ROOM IDENTIFICATION SIGNS ARE REQUIRED TO BE TACTILE PER ITEM "D" ABOVE.



F3 ACCESSIBLE PARKING POLE SIGN

SCALE: 1" = 1'-0"

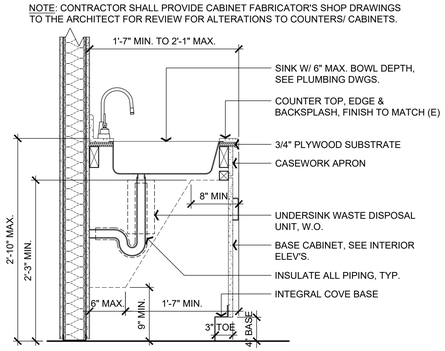
D00000 111



E3 DETECTABLE WARNING SURFACE

SCALE: 1/2" = 1'-0"

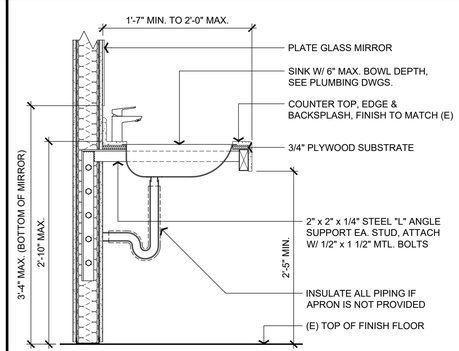
D00000 101



D3 ACCESSIBLE SINK AT CASEWORK

SCALE: 1" = 1'-0"

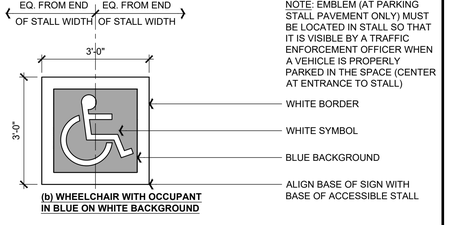
D00000 805



C3 ACCESSIBLE SINK AT COUNTER

SCALE: 1" = 1'-0"

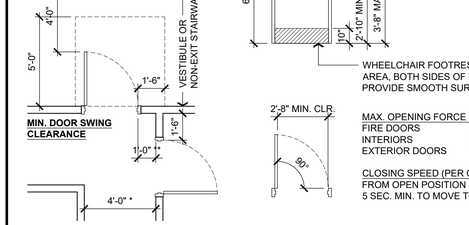
D00000 806



F4 ACCESSIBLE PARKING STALL SIGN

SCALE: 1/2" = 1'-0"

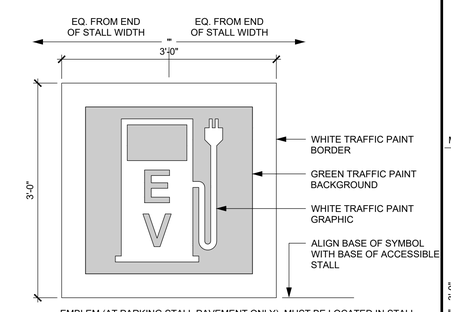
D00000 112



E4 ACCESSIBLE DOORS

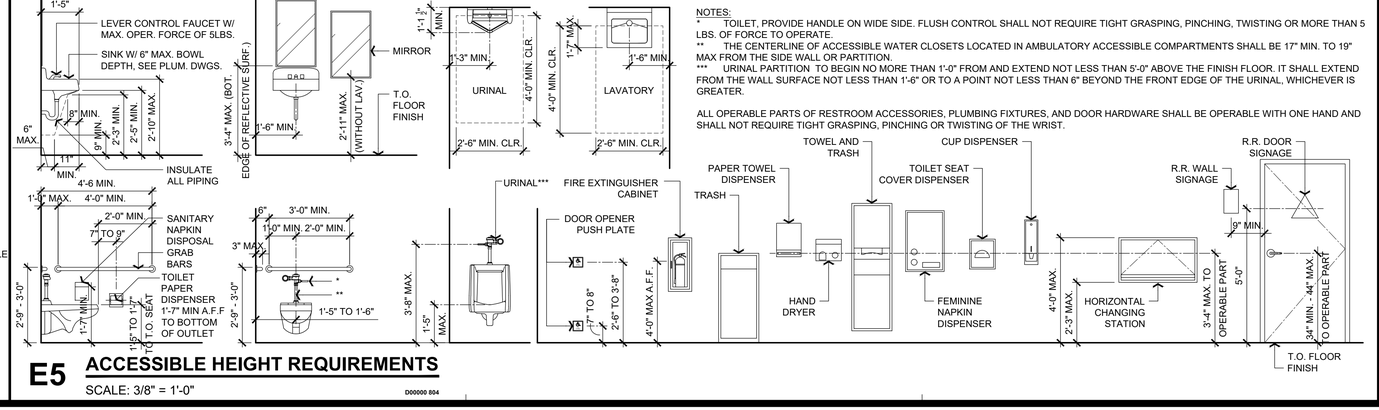
SCALE: 1/4" = 1'-0"

D00000 802



F5 EV PARKING PAVEMENT SYMBOL

SCALE: 1" = 1'-0"



E5 ACCESSIBLE HEIGHT REQUIREMENTS

SCALE: 3/8" = 1'-0"

D00000 804

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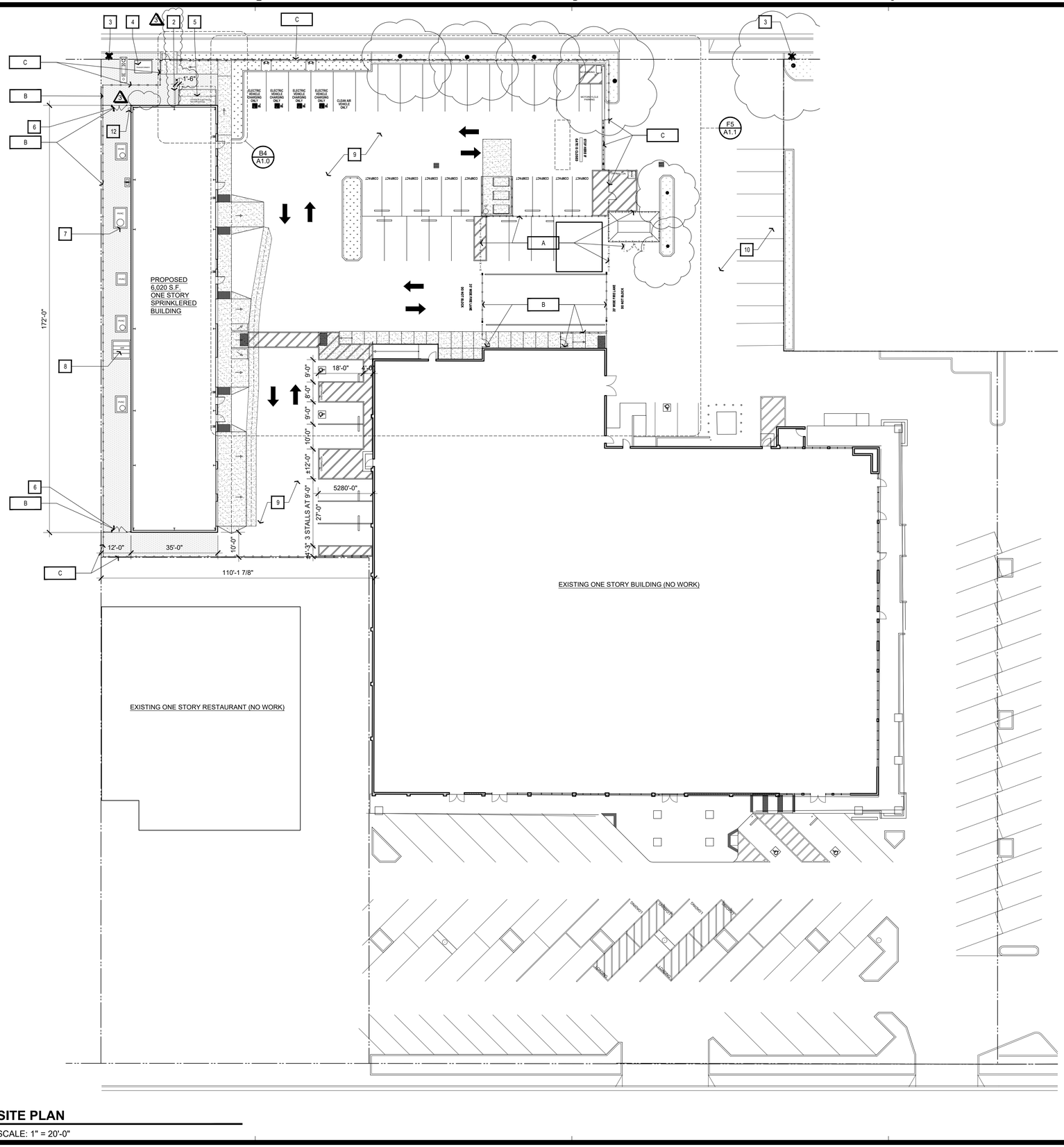
SHEET A0.3 ACCESSIBILITY
OF 15 SHEETS



F5 SITE PLAN

SCALE: 1" = 20'-0"

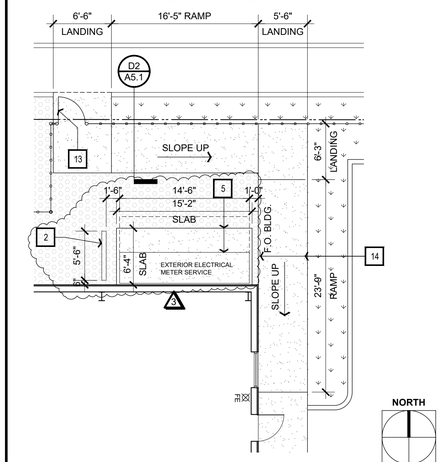
KEY NOTES:

1. SEE SHEET A1.1 FOR EXPANDED PARKING PLAN
2. 5'-6" L X 10'-0" H STEEL & METAL STUD SCREEN WALL. SEE EXTERIOR ELEVATIONS & STRUCTURAL PLANS. PROVIDE 6" CLEARANCE BETWEEN BUILDING & END OF WALL.
3. (E) FIRE HYDRANT
4. ELECTRICAL TRANSFORMER PAD. SEE ELECTRICAL DRAWINGS. PLACE 5FT MIN. CLEARANCE FROM NEW FENCES ON TWO SIDES.
5. MAIN ELECTRICAL SERVICE & 6" THICK CONCRETE SLAB. SEE ELECTRICAL DRAWINGS.
6. PAIR OF 3'-0" WIDE SWINGING GATES WITH PADLOCK, TYP. OF 2.
7. CONCRETE PAD FOR CONDENSER UNITS. (TYP. OF 6)
   7.1. CONCRETE PAD TO BE SIZED 6" BEYOND FACE OF UNIT, AND UNIT TO BE LOCATED 2-0" AWAY FROM FACE OF BUILDING. SEE MECHANICAL DRAWINGS FOR UNIT SIZE AND SPECIFICATIONS.
8. CONCRETE PAD FOR AN ENCLOSURE TO HOLD AN (E) AIR COMPRESSOR.
   8.1. ENCLOSURE TO BE INSULATED AND A MIN OF 7'-0" TALL X 4'-0" WIDE X 4'-0" DEEP. M & D ENTERPRISES, TALL WALL INSULATED SHED, OR SIMILAR.
9. (E) ASPHALT PARKING LOT W/ NEW SEAL COAT AND STRIPING. SEE CIVIL FOR AREAS OF MODIFIED PAVING.
10. (E) ASPHALT PARKING LOT OUTSIDE ARE OF WORK. NO MODIFICATIONS.
11. NOT USED.
12. LOCATION OF FIRE RISER
13. 3'-0" W X 8'-0" H ORNAMENTAL STEEL PEDESTRIAN MAN GATE W/ PANIC HARDWARE ON SECURE SIDE. EXIT ONLY. NO PUBLIC SIDE HARDWARE OR CARD READER
14. HANDRAILS AT RAMP SEE DETAIL D2/A5.1

FENCE LEGEND:

- A — (E) 10'-0" HIGH CHAINLINK FENCE WITH REDWOOD COLORED VINYL SLATS
- B — (N) 8'-0" HIGH CHAINLINK FENCE WITH REDWOOD COLORED VINYL SLATS TO MATCH EXISTING
- C — (N) 8'-0" HIGH BLACK ORNAMENTAL WROUGHT IRON 4 RAIL FENCE. 14 GA X 1-1/2" RAILS, 16 GA X 3/4" PICKETS, & 11 GA X 2-1/2" POSTS,
- PROPERTY LINE

SEE CIVIL PLANS FOR RAMP GRADING AND SLOPE



B4 PARTIAL SITE PLAN

SCALE: 1/8" = 1'-0"

SITE DATA:

TOTAL SITE AREA: 113,847 S.F.

(N) BUILDING AREA: 6,020 S.F.

PARKING PROVIDED:

STANDARD:	22
COMPACT:	12
ACCESSIBLE:	2
ELECT. VEHICLE:	4
CLEAN AIR:	1

TOTAL: 41 PARKING SPACES PROVIDED

(E) BUILDING AREA: 6,020 S.F. (NOT IN SCOPE)

PARKING PROVIDED:

STANDARD:	80
ACCESSIBLE:	2

TOTAL: 82 PARKING SPACES EXISTING

PARKING REQUIREMENTS:

- INDUSTRIAL, MANUFACTURING, GENERAL STORAGE AND WAREHOUSING: NOT LESS THAN ONE PARKING SPACE FOR EACH 2,000 SQUARE FEET OF GROSS FLOOR AREA.
- OFFICES (EXCEPT MEDICAL OFFICES AND CLINICS): NOT LESS THAN ONE PARKING SPACE FOR EACH 400 SQUARE FEET OF GROSS FLOOR AND OR MORE THAN ONE PARKING SPACE FOR EACH 300 SQUARE FEET OF GROSS FLOOR AREA, BUT NOT LESS THAN FIVE SPACES

EXISTING BUILDING: 32,180 S.F. / 400 = 81 EXISTING PARKING REQUIRED

NEW BUILDING: 6,020 S.F. / 400 = 15 NEW PARKING REQUIRED

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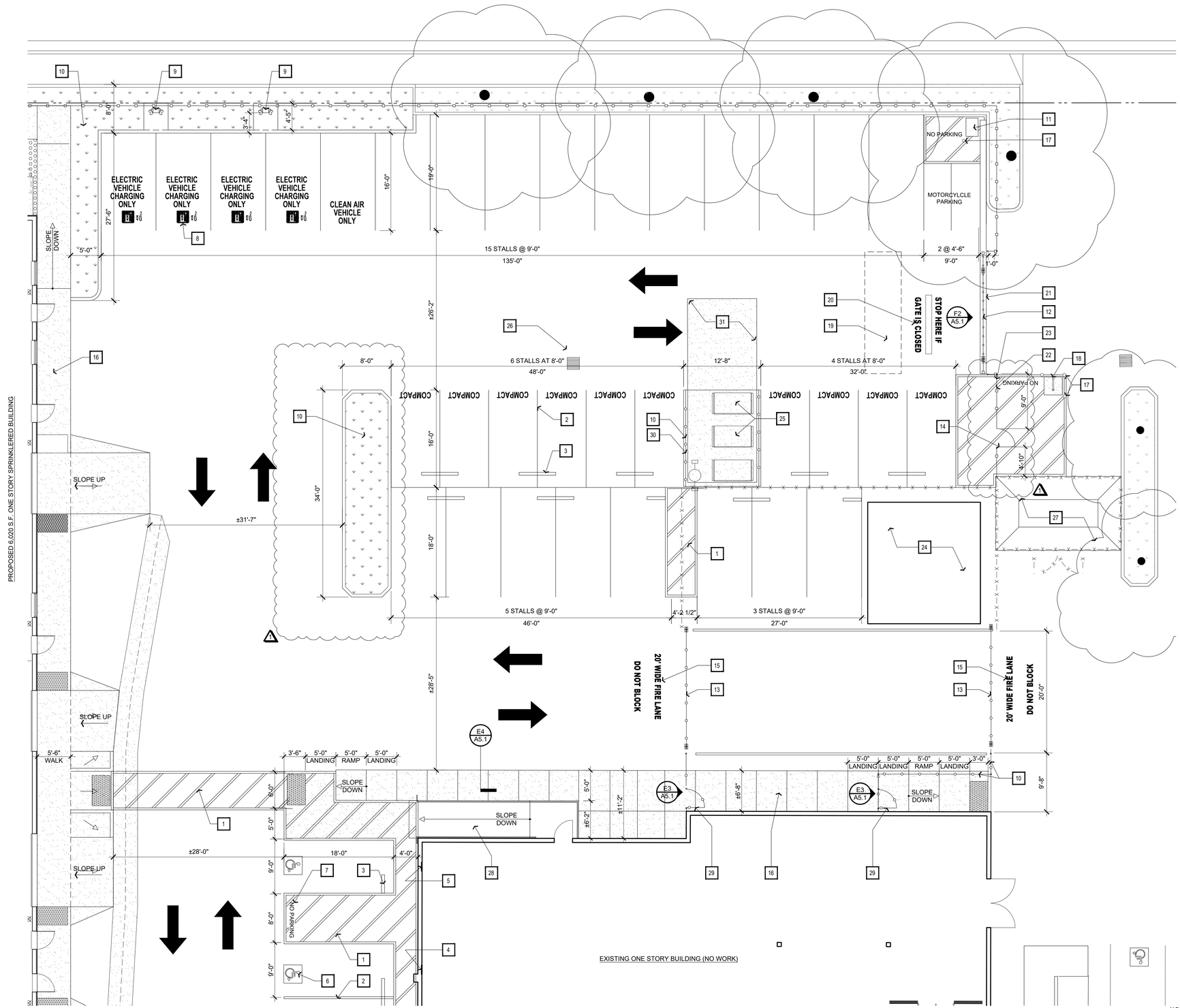
REVISIONS:

	DATE:	DESCRIPTION:
1	01/10/24	LANDSCAPING
2	03/22/24	FINISHES
3	07/29/24	ALL ELECTRIC

DATE	12.09.22
DRAWN	JDC/DH
JOB NO.	21027
SHEET	**A1.0** SITE PLAN
OF	15 SHEETS



F5 EXPANDED PARKING PLAN

SCALE: 1/8" = 1'-0"

SHEET NOTES:

1. MAX SLOPE AT CONCRETE LANDINGS: 2% IN ANY DIRECTION
2. MAX SLOPE AT RAMPS: 5% IN DIRECTION OF TRAVEL
3. MAX CROSS SLOPE AT SIDEWALKS: 2% AWAY FROM BUILDINGS
4. SIDEWALKS TO BE A 4" CONCRETE CURB SEPARATING VEHICULAR TRAFFIC FROM CIRCULATION PATH PER CBC 11B-250.1
5. SEE A1.0 SITE PLAN FOR FENCE LEGEND AND KEYNOTES

KEY NOTES:

1. 4" WIDE BLUE TRAFFIC PAINT BORDER WITH 4" WIDE WHITE TRAFFIC PAINT DIAGONALS @ 3'-0" O.C., MAX. SLOPE IN ANY DIRECTION NOT TO EXCEED 2%.
2. 4" WIDE WHITE TRAFFIC PAINT.
3. NEW 6" HIGH x 4'-0" LONG WHEEL STOP, SEE DETAIL D3/A5.1.
4. NEW ACCESSIBLE PARKING SIGN, SEE DETAIL F3/A0.3.
5. NEW ACCESSIBLE VAN PARKING SIGN, SEE DETAIL F3/A0.3.
6. NEW ACCESSIBLE PARKING STALL SYMBOL, SEE DETAIL F4/A0.3.
7. 1'-0" HIGH LETTERING IN WHITE TRAFFIC PAINT: "NO PARKING".
8. EV PARKING STALL SYMBOL, SEE DETAIL F5/A0.3.
9. DUEL CHARGER ELECTRIC VEHICLE CHARGING STATION. TYP. OF 2. SEE ELECTRICAL DRAWINGS
10. NEW LANDSCAPING PLANTERS
11. GATE CONTROLLER. SEE ELECTRICAL DRAWINGS
12. 20' W X 8'-0" H ORNAMENTAL STEEL ROLLING ELECTRICAL VEHICLE GATE. SEE DETAIL F2/A5.1 FOR ELEVATION
13. REPLACE EXISTING MANUAL ROLLING GATE WITH NEW 20'-0" LONG CHAIN LINK MANUAL ROLLING GATE WITH VINYL SLATS
14. 3'-0" W X 8'-0" H ORNAMENTAL STEEL PEDESTRIAN MAN GATE W/ PANIC HARDWARE ON SECURE SIDE AND PULL WITH CARD READER ON PUBLIC SIDE.
15. PAINTED DRIVEWAY PAVEMENT SIGNAGE "20' WIDE FIRE LANE DO NOT PARK"
16. PROPOSED CONCRETE WALK
17. 6" PROTECTIVE BOLLARDS. SEE DETAIL D4/A5.1
18. 3'-0" HIGH PAINTED STEEL PEDESTAL WITH KEYPAD TO OPEN MOTORIZED VEHICULAR ACCESS GATES
19. VEHICLE GATE SENSOR UNDER ASPHALT PAVING. COORDINATE LOCATION WITH ELECTRICAL GATE MOTOR AND KEYPAD
20. PAINTED DRIVEWAY PAVEMENT SIGNAGE "STOP HERE IF GATE IS CLOSED".
21. 12"W X 6" DEEP CONC. SLAB FOR GATE TRACK. SEE DETAIL F5/A5.1
22. KNOX BOX, MODEL# 3200 ON FENCE @ +5'-0" ABOVE THE ASPHALT
23. "CLICK2ENTER" ELECTRIC GATE EMERGENCY CONTROLLER @ +6'-0" ABOVE THE ASPHALT MIN.
24. (E) STORAGE SHED IN "IT" YARD TO REMAIN
25. TRASH DUMPSTER, N.I.C.
26. DRAINAGE GRATE. SEE CIVIL PLANS
27. (E) EMERGENCY GENERATOR AND ENCLOSURE
28. (E) CONCRETE RAMP AND HANDRAILS
29. (N) 8'-0" HIGH CHAIN LINK GATE. SEE F4/A5.1 FOR DETAILS.
30. (N) 8" WIDE X 6' HIGH CONCRETE CURB ON THREE SIDES OF DUMPSTER ENCLOSURE.
31. (N) 6" THICK X 3,000 PSI CONCRETE SLAB & APRON WITH #4 REBAR @ 1'-0" EACH WAY MID DEPTH OF SLAB.

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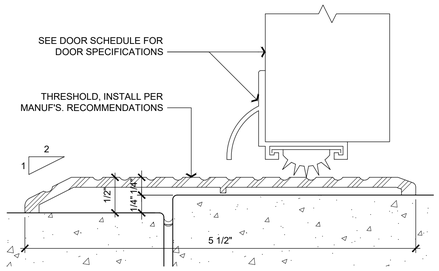
SHEET	A1.1
	EXPANDED PARKING
OF	15 SHEETS

NOTE: VERIFY EXISTING CONDITIONS FOR FLATWORK CONFIGURATION.



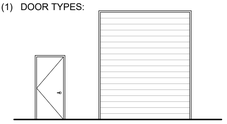
F2 EXTERIOR DOOR THRESHOLD

SCALE: 1:1

D00000 801

DOOR SCHEDULE NOTES

(1) DOOR TYPES:



(2) FIRE RATING ASSEMBLY:

A = NONE / NO RATING

(3) THICKNESS:
A = 1-3/4"
B = FACTORY

(4) CONSTRUCTION
A = 14 GA. HEAVY DUTY HOLLOW METAL
B = SOLID CORE WOOD DOOR
C = STEEL

(5) FACING & FINISH
A = PAINTED METAL
B = PRIMED AND PAINTED WOOD
C = FACTORY POWDER COAT PAINT FINISH

(6) GLAZING:
NONE

(7) HARDWARE GROUPS
SEE DOOR HARDWARE GROUPS THIS SHEET

(8) FRAME TYPE:
A = FACTORY PRIMED, FIELD PAINTED
B = TIMELY FRAME OR SIMILAR

(9) REMARKS:
A = INSULATED GRADE LEVEL DOOR
B =NON-INSULATED GRADE LEVEL DOOR
C = PREPPED FOR FUTURE CARD READER

DOOR HARDWARE GROUPS

HARDWARE GROUP 1: (EXTERIOR)
3 NRP BUTT HINGES
1 ENTRANCE LOCKSET - ND53PD
1 CLOSER
1 THRESHOLD
1 DOOR SHOE
1 WEATHERSTRIPPING KIT

HARDWARE GROUP 2: (MULTI-TOILET)
3 NRP BUTT HINGES
1 SURFACE MOUNTED CLOSER
1 4"X16" PUSH PLATE
1 4"X16" PULL PLATE
1 10" HIGH KICK PLATE
1 4" HIGH MOP PLATE
1 SOUND SEAL KIT
1 DOOR STOP

HARDWARE GROUP 3: (PASSAGE)
3 NRP BUTT HINGES
1 PASSAGE LATCHSET - ND10S
1 SOUND SEAL KIT
1 DOOR STOP

HARDWARE GROUP 4 (SECURE STORAGE)
3 NRP BUTT HINGES
1 ENTRANCE LOCKSET - ND53PD
1 SURFACE MOUNTED CLOSER
1 SOUND SEAL KIT
1 DOOR STOP

HARDWARE GROUP 5: (ROLL-UP DOOR)
F-265 CURTAIN SLAT PROFILE. GALV. STL.
MFR STANDARD TRACKS, SUPPORTS & HARDWARE
REPLACEABLE WEATHERSEALS TOP & BOTTOM

DOOR SCHEDULE

SYMBOLS	SIZE	(1) TYPE	(2) FIRE RATING	(3) THICKNESS	(4) CONSTRUCTION	(5) FACING & FINISH	(6) GLAZING	(7) HARDWARE GROUP	(8) FRAME TYPE	(9) REMARKS
100	3'-0"x7'-0"	A	A	A	A	A	-	1	B	C
101	3'-0"x7'-0"	A	A	A	B	B	-	2	B	-
102	3'-0"x7'-0"	A	A	A	A	A	-	1	B	C
103	12'-0"x12'-0"	B	A	B	C	C	-	5	A	A
104	3'-0"x7'-0"	A	A	A	B	B	-	3	B	-
105	3'-0"x7'-0"	A	A	A	B	B	-	4	B	C
106	3'-0"x7'-0"	A	A	A	A	A	-	1	B	C
107	10'-0"x12'-0"	B	A	B	C	C	-	5	A	A
108	3'-0"x7'-0"	A	A	A	B	B	-	3	B	-
109	12'-0"x12'-0"	B	A	B	C	C	-	5	A	A
110	3'-0"x7'-0"	A	A	A	A	A	-	1	B	C
111	3'-0"x7'-0"	A	A	A	B	B	-	3	B	-
112	3'-0"x7'-0"	A	A	A	A	A	-	1	B	C
113	12'-0"x12'-0"	B	A	B	C	C	-	5	A	B
114	10'-0"x12'-0"	B	A	B	C	C	-	5	A	B
115	10'-0"x12'-0"	B	A	B	C	C	-	5	A	B

DOOR GENERAL NOTES

1. ALL DOORS TO COMPLY WITH CBC REQUIREMENTS FOR OPENING AND CLOSING FORCE AS SPECIFIED IN DETAIL E4/A0.3.
2. ALL DOORS ARE EQUIPPED WITH SINGLE EFFORT NON-GRASPING HARDWARE.
3. ALL EXIT DOORS TO BE OPENABLE WITHOUT USE OF A KEY OR SPECIAL KNOWLEDGE.
4. ALL LOCK/LEVER AND CLOSERS SHALL COMPLY WITH ACCESSIBILITY REQUIREMENTS.

SHEET NOTES:

A. DIMENSIONS ARE TO CENTERLINE OF NEW WALLS AND FACE OF WALL (F.O.W.) OF EXISTING WALLS, U.N.O.

B. SEE A2.2 FOR INTERIOR FINISH PLANS

C. TYPE "X" G.WB. IS NOT REQUIRED AT NON-RATED WALLS, HOWEVER IT IS THE ARCHITECT'S STANDARD FOR ALL G.WB.

D. ALL STUD SIZE INFORMATION FROM STEEL STUD MANUFACTURES ASSOCIATION HANDBOOK 2015 EDITION.

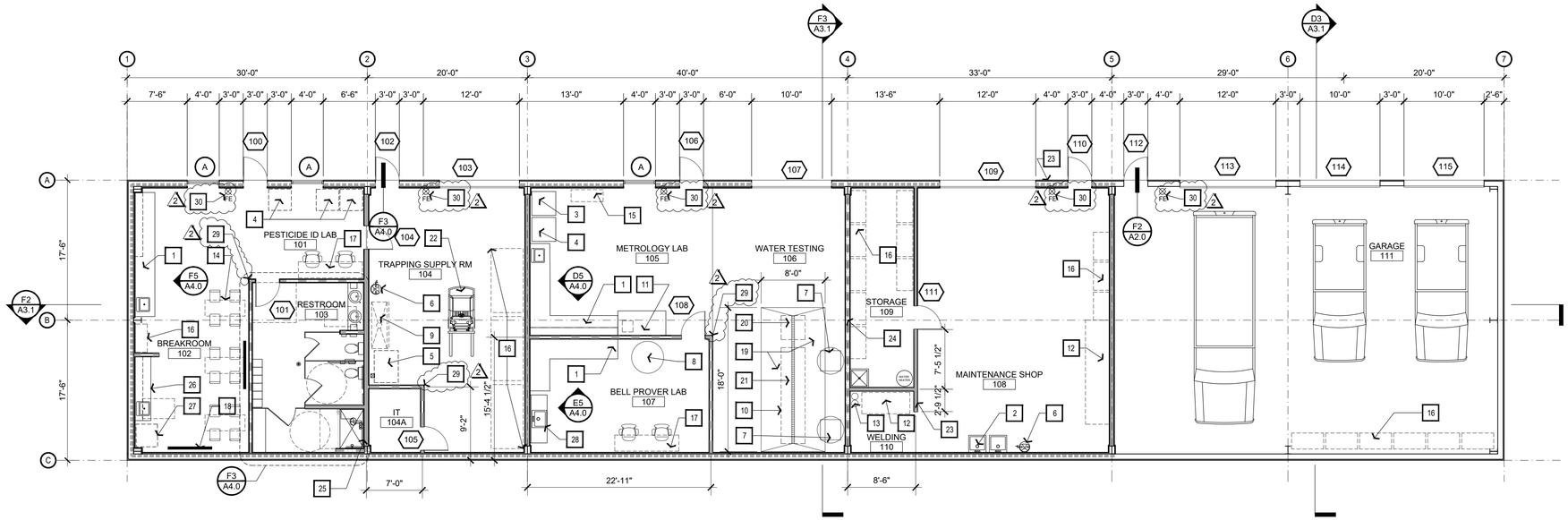
E. SEE DETAIL E5/A0.3 FOR MOUNTING INFORMATION OF TOILET FIXTURES AND ACCESSORIES.

F. SEE A2.2 FOR INTERIOR FINISH PLANS

G. SEE STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL PLANS FOR MORE INFORMATION

KEYNOTES

1. 2'-6" DEEP LOWER CABINETS, 1'-0" DEEP UPPER CABINETS WHERE OCCURS. SEE INTERIOR ELEVATIONS A4.0 FOR MORE DETAILS
2. TWO STAINLESS STEEL SINKS, 20" X 20" BY 16" DEEP MIN. (SEE PLUMBING FIXTURE SCHEDULE P0.2)
3. SAMPLE FREEZER (O.F.O.I.)
4. SAMPLE REFRIGERATOR (O.F.O.I.)
5. ICE MACHINE WITH 6" x 6" FLOOR SINK (SEE PLUMBING FIXTURE SCHEDULE P0.2)
6. EMERGENCY EYE WASH STATION (SEE PLUMBING FIXTURE SCHEDULE P0.2)
7. 200 GALLON H20 STORAGE TANK BY DEN HARTOG INDUSTRIES INC, PART NUMBER CB200-36. TANK ON ELEVATED STAND BY DEN HARTOG INDUSTRIES, PART NUMBER CB036-15ST. (2)
8. COMPRESSED AIR WITH BELL PROVER
9. FUME HOOD 25" X 70" OVER 24" X 72" 16-GA STAINLESS STEEL WORK TABLE WITH UNDERSHELF. (2)
10. 12' LONG H20 TEST BENCH WITH COMPRESSED AIR AND WATER FILTRATION
11. ELECTRIC METER TEST BENCH/ JACK WITH 240-VOLT ELECTRICITY
12. TENANT SUPPLIED WORK BENCH AND EQUIPMENT
13. 6" X 20 GA. FLAT STRAP BLOCKING. CENTER @ 4'-0" A.F.F. INSTALL WALL MOUNTED ADJUSTABLE CYLINDER BRACKET FOR EACH CYLINDER. VERIFY CYLINDER COUNT WITH TENANT.
14. TABLE AND CHAIRS TYP. (O.F.O.I.)
15. BOOKSHELF TYP. (O.F.O.I.)
16. STORAGE SHELVING TYP. (O.F.O.I.)
17. COMPUTER DESK TYP. (O.F.O.I.)
18. 6'-0" WIDE PROJECTOR SCREEN (O.F.O.I.)
19. SLOPE SLAB TO DRAIN (SEE PLUMBING DRAWINGS)
20. 3'-0" X 3'-0" SCALE
21. 12'-0" LONG TRENCH DRAIN (SEE PLUMBING FIXTURE SCHEDULE P0.2)
22. FORKLIFT (LPG)
23. NO SMOKING SIGN
24. FULL HEIGHT DEMISING WALL TYP. ALIGN CENTER AT COLUMN U.N.O.
25. FULL HEIGHT DEMISING WALL EXCEPTION. ALIGN 6" STUD OFF-CENTER OF COLUMN SO GYP BOARD IS FLUSH FULL LENGTH AT PESTICIDE ID LAB AND RESTROOM
26. BREAK-ROOM CASEWORK: 2'-0" LOWER CABINETS AND 1'-0" UPPER CABINETS WITH ADA COMPLIANT SINK. SEE INTERIOR ELEVATIONS ON SHEET A4.0
27. BREAK-ROOM FOOD REFRIGERATOR WITH HARD LINE PLUMBING- NOT TO BE USED USED FOR SAMPLES (SEE PLUMBING FIXTURE SCHEDULE P0.2)
28. STAND ALONE DEEP SINK WITH FLOOR SINK. (SEE PLUMBING FIXTURE SCHEDULE P0.2)
29. 4'-0" H VINYL CORNER GUARD. TYPICAL OF 3.
30. 2A-20BC WALL SURFACE MOUNTED FIRE EXTINGUISHER. TYPICAL OF 5.
31. WINDOW COVERINGS FROM MECHO, MODEL ECOVEIL 1550 SERIES (3% OPEN). COLOR TO BE 1552 BEIGE. (2)



F5 FLOOR PLAN

SCALE: 1/8" = 1'-0"

WALL LEGEND:

EXTERIOR WALL

EXTERIOR WALL FINISHED: INSULATION WITHIN 8" CAVITY CREATED BY Z-GURTS. 7/8" HAT CHANNEL, AND 5/8" TYPE X GYP ON FINISH SIDE OF WALL FULL. HEIGHT OF FINISH WALL PER ADJACENT CEILING TYPE. SEE DETAILS E3/A5.0 & F3/A5.0.

FULL HEIGHT WALL: 6" x 20 GA. METAL STUDS AT 2'-0" O.C. WITH 1 LAYER OF 5/8" TYPE 'X' G.WB. EACH SIDE TO ROOF STRUCTURE ABOVE. SEE DETAILS E5/A5.0 & F5/A5.0.

FULL HEIGHT ONE-HOUR FIRE RATED WALL: G.A. FILE # WP-1072
3-5/8" x 20 GA. METAL STUDS AT 2'-0" O.C. WITH 1 LAYER OF 5/8" TYPE 'X' G.WB. EACH SIDE. FRAME WALL TO UNDERSIDE OF ROOF STRUCTURE ABOVE. PROVIDE COLD ROLLED CHANNEL BRIDGING HORIZONTALLY @ 5'-0" O.C.ENTIRE HEIGHT OF WALL. USE 1" TYPE 'S' DRYWALL SCREWS 8" O.C. @ VERTICAL JOINTS & 1'-0" O.C. @ FLOOR & CEILING RUNNERS & INTERMEDIATE STUDS. NOTE: ALL PENETRATIONS IN FIRE RATED ASSEMBLY SHALL BE FIRE STOPPED WITH AN APPROVED FIRE BARRIER. USE 3M UL FIRE SYSTEM WL 1001. (3M PRODUCT CP25WB+ FIRE BARRIER CAULK). SEE DETAIL D5/A5.0. GA FILE NO. WP 1072

PARTITION WALL: 3 5/8" x 20 GA. METAL STUDS AT 2'-0" O.C. WITH 1 LAYER OF 5/8" TYPE 'X' G.WB. EACH SIDE TO 6" ABOVE CEILING. SEE DETAIL C5/A5.0.

NORTH

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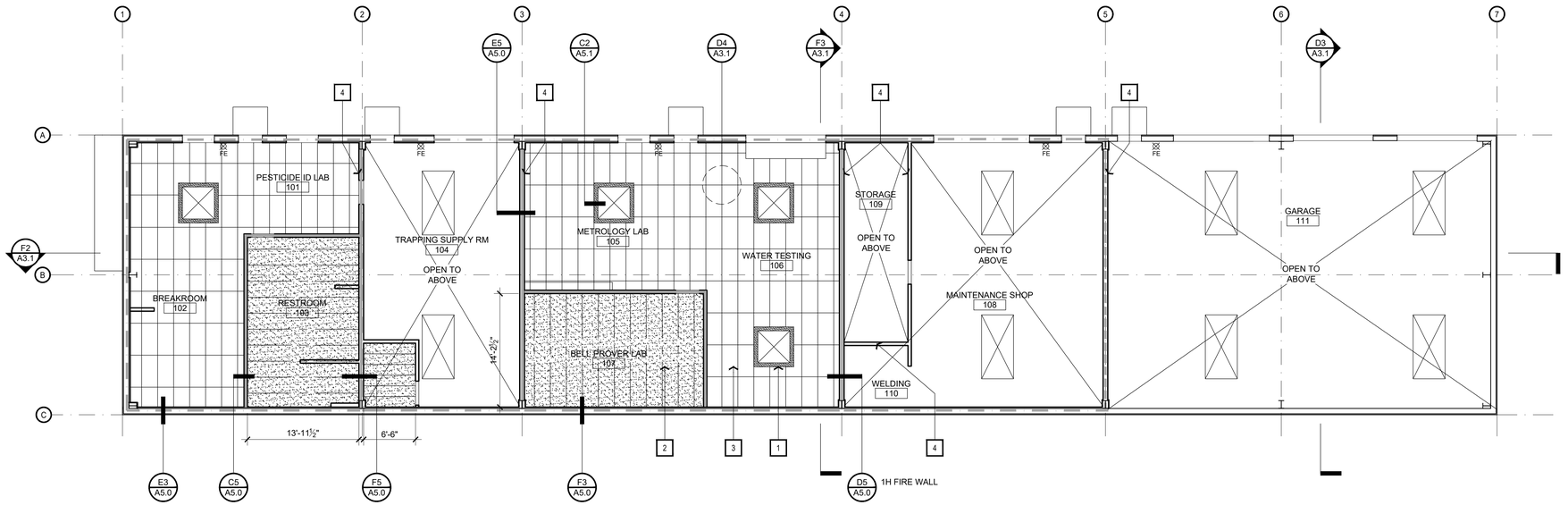
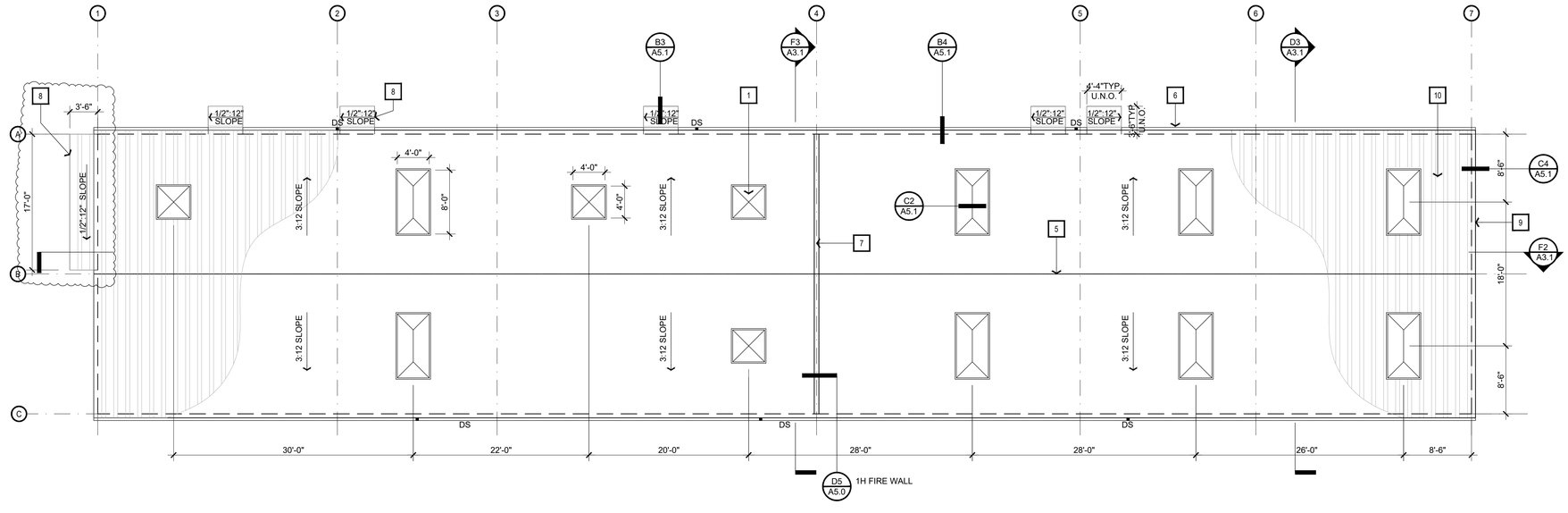


F3 REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"



F5 ROOF PLAN

SCALE: 1/8" = 1'-0"

SHEET NOTES:

A. SEE ELECTRICAL DRAWINGS LIGHT FIXTURES AND POWER SUPPLY AT CEILINGS.

B. ELECTRICIAN TO EVALUATE PRELIMINARY LIGHTING PLAN & NEW FIXTURES SPECIFIED, FOR TITLE 24 COMPLIANCE. ELECTRICIAN TO EVALUATE/INCLUDE EMERGENCY LIGHTING & MOTION SENSORS IN SCOPE OF WORK.

C. SEE MECHANICAL DRAWINGS FOR THE HVAC SUPPLY AND RETURN LOCATIONS.

D. DIFFERED FIRE SPRINKLER DRAWINGS WILL SHOW FIRE SPRINKLER LAYOUT

E. CONTRACTOR TO VERIFY ALL MATERIALS & FINISHES WITH THE OWNER.

F. CEILING FIXTURE SUPPORT (I.E. LIGHT, FIXTURES) SHALL BE SUPPORTED PER CBC STANDARDS (CURRENT EDITION) SECTION 25. IN ADDITION TO THIS SECTION, FIXTURES WEIGHTING LESS THAN 56 POUNDS SHALL HAVE TWO NO.12 GA. WIRE HANGERS CONNECTED FROM THE FIXTURE HOUSING TO THE STRUCTURAL MEMBERS ABOVE. THESE WIRES MAY BE SLACK. FIXTURES WEIGHTING 56 POUNDS OR MORE SHALL BE SUPPORTED WITH APPROVED HANGERS DIRECTLY FROM THE STRUCTURAL MEMBERS ONLY. GRID SHALL NOT BE SUPPORTED FROM OTHER TRADES WORK.

KEY NOTES:

1. SKYLIGHTS. EITHER 4'X4' OR 4'X8' AS SHOWN PER PLAN
2. G. WB. CEILING
3. T-BAR GRID WITH ACOUSTIC PANEL CEILING TILES
4. FULL HEIGHT WALL TO UNDERSIDE OF ROOFING
5. RIDGE OF MAIN ROOF. 3:12 SLOPE.
6. CONTINUOUS 6X4 GUTTER WITH 3X4 DOWNSPOUT. SEE SHEET A3.0 FOR DOWNSPOUT LOCATIONS AND EXTERIOR FINISH LEGEND FOR MATERIALS AND COLORS.
7. FIRE WALL EXTENDING 30" ABOVE TOP OF ROOF. SEE DETAIL D5/A5.0
8. PRE-ENGINEERED METAL CANOPY WITH METAL ROOFING TO MATCH MAIN ROOF. SEE EXTERIOR ELEVATIONS FOR ROOFING TYPE.
9. RAKE TRIM BY PRE-ENGINEERED METAL BUILDING. SEE REFERENCE DRAWING C4/A5.1
10. METAL ROOFING. SEE EXTERIOR ELEVATIONS FOR ROOFING TYPE & PRE-ENGINEERED METAL BUILDING DRAWINGS.
11. FROM GRIDLINES 1-5 (ALL ROOMS OTHER THAN THE GARAGE), A WHITE POLY-SCRIM FACING WILL BE INSTALLED OVER THE INSULATION AT THE UNDERSIDE OF THE ROOF.

CEILING JOIST SCHEDULE

SPAN:	CEILING JOIST:
5'-0" MAX	4", 20 GA, 16" O.C.
8'-0" MAX	4", 20 GA, 16" O.C.
10'-0" MAX	4", 18 GA, 16" O.C.
12'-0" MAX	6", 18 GA, 24" O.C.
14'-0" MAX	6", 18 GA, 16" O.C.
18'-0" MAX	8", 18 GA, 16" O.C.
22'-0" MAX	10", 18 GA, 16" O.C.
26'-0" MAX	12", 16 GA, 16" O.C.

CEILING AND INSULATION LEGEND

- 2' X 4' METAL T-BAR GRID WITH LAY-IN ACOUSTICAL CEILING TILES. +10'-0"A.F.F. SEE DETAIL D4/A3.1.
- G. WB. CEILING: METAL JOISTS PER SCHEDULE WITH 1 LAYER OF 5/8" TYPE 'X' G. WB. ON THE ROOM SIDE. INSTALL 3 1/2" UNFACED FORMALDEHYDE FREE SOUND BATT INSULATION ABOVE CEILING. +8'-0" A.F.F.
- NO CEILING WITHIN THE SPACE. INSTEAD THE ROOM WILL BE OPEN TO ROOF ABOVE.
- R-19 BATT INSULATION FULL HEIGHT IN WALL
- R-13 BATT INSULATION FULL HEIGHT TO STRUCTURE ABOVE
- 3 1/2" UNFACED FORMALDEHYDE FREE SOUND BATT INSULATION TO 6" ABOVE ADJACENT CEILING HEIGHT

NOTES:
1. SEE ELECTRICAL DRAWINGS FOR ALL LIGHT FIXTURES AND POWER SUPPLY AT CEILINGS.
2. SEE MECHANICAL DRAWINGS FOR ALL HVAC SUPPLY/ RETURN & EXHAUST FAN LOCATIONS.
3. CEILING LIGHT FIXTURES SHALL BE SUPPORTED PER C.B.C (CURRENT EDITION) SECTION 1613.1 AND ASCE 7-16 STANDARDS. FIXTURES WEIGHING LESS THAN 56 POUNDS SHALL HAVE IN ADDITION TO THE STANDARDS MENTIONED ABOVE, TWO NO. 12 GA. WIRE HANGERS CONNECTED FROM THE FIXTURE HOUSING TO THE STRUCTURE ABOVE. THESE WIRES MAY BE SLACK. FIXTURES WEIGHING 56 POUNDS OR MORE SHALL BE SUPPORTED WITH APPROVED HANGERS DIRECTLY FROM THE STRUCTURE ABOVE.
4. VERIFY ALL THERMAL INSULATION R-VALUES WITH MECHANICAL DESIGNER.

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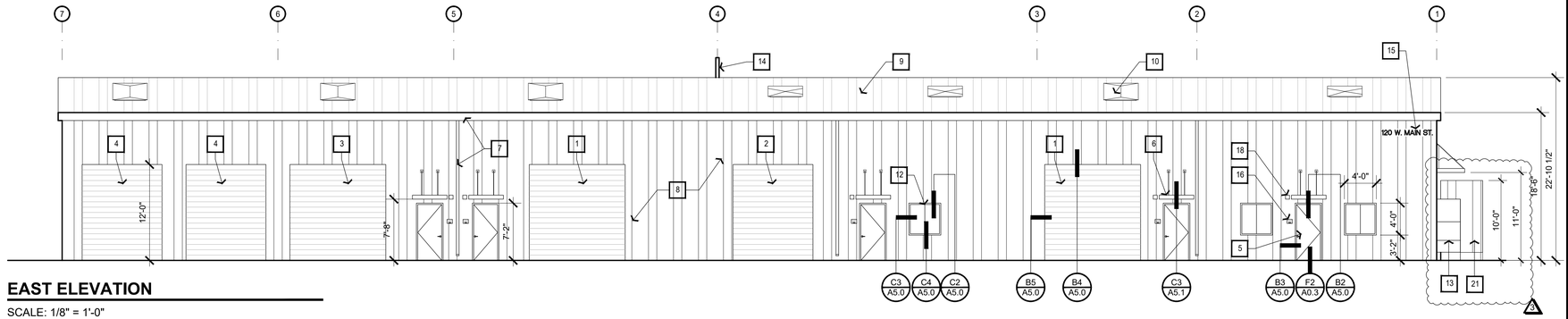
WOODLAND, CA

REVISIONS:

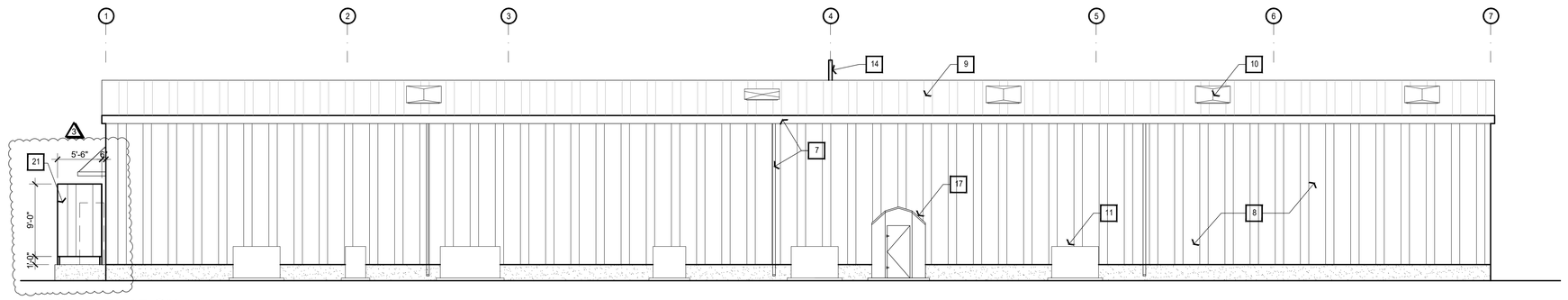
	DATE:	DESCRIPTION:
1	01/10/24	LANDSCAPING
2	03/22/24	FINISHES
3	07/29/24	ALL ELECTRIC

DATE 12.09.22
DRAWN JDC/DH
JOB NO. 21027
SHEET A2.1
REFLECTED CEILING
OF 15 SHEETS



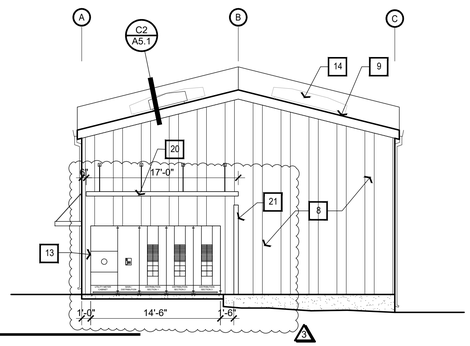
F2 EAST ELEVATION

SCALE: 1/8" = 1'-0"



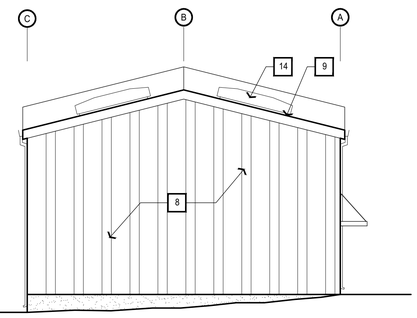
F3 WEST ELEVATION

SCALE: 1/8" = 1'-0"



F4 NORTH ELEVATION

SCALE: 1/8" = 1'-0"



D4 SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

KEY NOTES:

1. (2) 12' X 12' INSULATED ELECTRIC ROLL UP DOOR
2. (1) 10' X 12' INSULATED ELECTRIC ROLL UP DOOR
3. (1) 12' X 12' ELECTRIC ROLL UP DOOR
4. (2) 10' X 12' ELECTRIC ROLL UP DOOR
5. 3' X 7' KEYED ENTRANCE DOOR
6. 4'-4" WIDE X 3' DEEP OVERHEAD AWNING COVER CENTERED OVER ENTRANCE DOORS
7. GUTTER AND DOWNSPOUT
8. METAL SIDING
9. PBR ROOF PANELS
10. 4' X 8' SKYLIGHT
11. (5) CONDENSER UNITS ON CONCRETE PAD. ONE UNIT PER SUITE
12. 4' X 4' SLIDING WINDOW
13. LOCATION OF MAIN ELECTRICAL SERVICE
14. 1 HOUR & 30" HIGH PARAPET FIRE WALL
15. ADDRESS SIGNAGE
16. ROOM NAME. SEE C2/A0.3
17. AIR COMPRESSOR IN SHED ON CONCRETE PAD. ENCLOSURE TO BE INSULATED AND A MIN OF 7'-0" TALL X 4'-0" WIDE X 4'-0" DEEP. M & D ENTERPRISES, TALL WALL INSULATED SHED, OR SIMILAR.
18. WALL PACK UNIT AT EACH ENTRANCE DOOR. TYP. OF 5 (2)
19. NOT USED. (2)
20. 17'-0" WIDE X 3'-8" DEEP OVERHEAD AWNING COVER OVER ELECTRICAL SERVICE PANELS.
21. 5'-6" L X 10'-0" H STEEL & METAL STUD SCREEN WALL. FINISH WITH METAL WALL SIDING TO MATCH BUILDING. SEE STRUCTURAL PLANS FOR ADD'L INFORMATION. PROVIDE 6" CLEARANCE BETWEEN BUILDING & END OF WALL. (3)

EXTERIOR COLORS & MATERIALS LEGEND

1. METAL WALL PANELS: IC72-WALL PANEL BY METAL SALES OR SIMILAR. COLOR: BRIGHT WHITE(39)
2. METAL ROOF PANELS: PBR-PANEL BY METAL SALES OR SIMILAR. COLOR:OCEAN BLUE (35)
3. FIRE WALL PANELS: PBR-PANEL BY METAL SALES OR SIMILAR. COLOR:OCEAN BLUE (35)
4. ENTRANCE AWNINGS: COLOR: OCEAN BLUE TO MATCH ROOFING
5. GUTTERS: COLOR: OCEAN BLUE TO MATCH ROOFING
6. DOWNSPOUTS: COLOR: BRIGHT WHITE TO MATCH WALL SIDING

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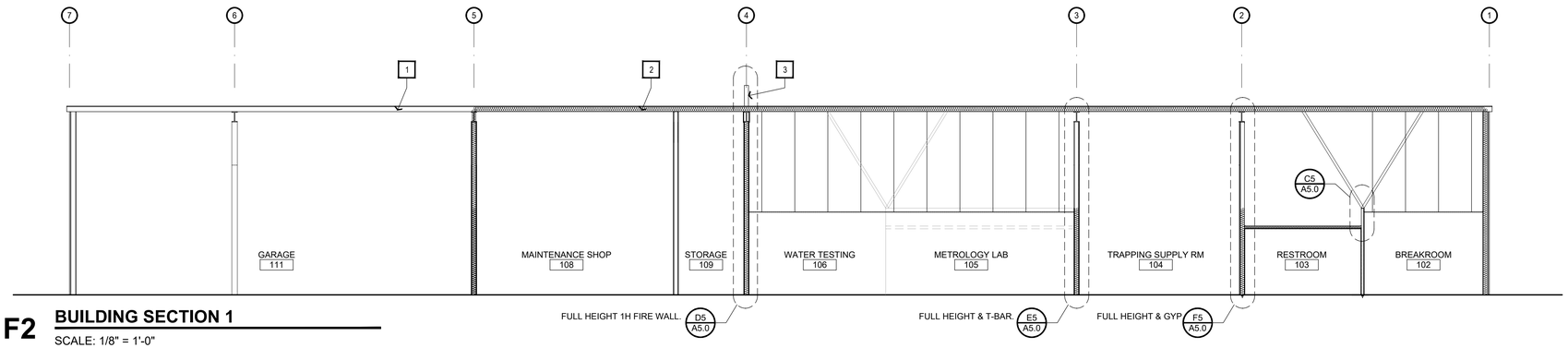
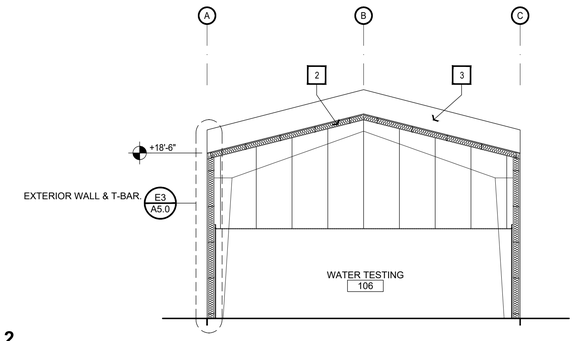
SHEET	**A3.0** EXTERIOR ELEVS.
OF	15 SHEETS



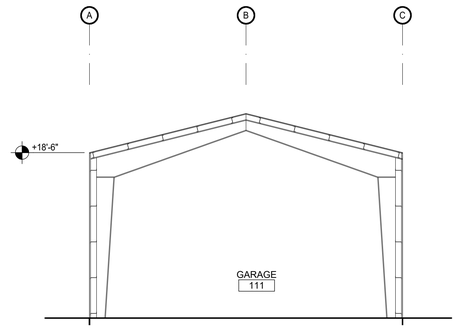
F2 BUILDING SECTION 1

SCALE: 1/8" = 1'-0"



F3 BUILDING SECTION 2

SCALE: 1/8" = 1'-0"



D3 BUILDING SECTION 3

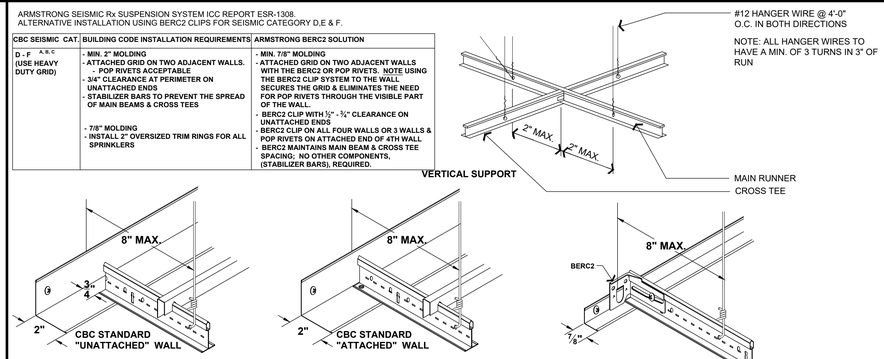
SCALE: 1/8" = 1'-0"

KEY NOTES:

1) NON-INSULATED PARKING BAYS
2) INSULATED ELVELOPE AT EXTERIOR WALLS AND UNDERSIDE OF THE ROOF STRUCTURE BETWEEN GRIDLINES 1-5
3) FIRE WALL EXTENDING 30" BEYOND TOP OF ROOF

ARMSTRONG SEISMIC Rx SUSPENSION SYSTEM ICC REPORT ESR-1308.
ALTERNATIVE INSTALLATION USING BERC2 CLIPS FOR SEISMIC CATEGORY D,E & F.

CBC SEISMIC CAT.	BUILDING CODE INSTALLATION REQUIREMENTS	ARMSTRONG BERC2 SOLUTION
D - F [A, B, C] (USE HEAVY DUTY GRID)	- MIN. 2" MOLDING - ATTACHED GRID ON TWO ADJACENT WALLS. - POP RIVETS ACCEPTABLE - 3/4" CLEARANCE AT PERIMETER ON UNATTACHED ENDS - STABILIZER BARS TO PREVENT THE SPREAD OF MAIN BEAMS & CROSS TEES - 7/8" MOLDING - INSTALL 2" OVERSIZED TRIM RINGS FOR ALL SPRINKLERS	- MIN. 7/8" MOLDING - ATTACHED GRID ON TWO ADJACENT WALLS WITH THE BERC2 OR POP RIVETS. NOTE USING THE BERC2 CLIP SYSTEM TO THE WALL SECURES THE GRID & ELIMINATES THE NEED FOR POP RIVETS THROUGH THE VISIBLE PART OF THE WALL. - BERC2 CLIP WITH ½" - ¾" CLEARANCE ON UNATTACHED ENDS - BERC2 CLIP ON ALL FOUR WALLS OR 3 WALLS & POP RIVETS ON ATTACHED END OF 4TH WALL - BERC2 MAINTAINS MAIN BEAM & CROSS TEE SPACING; NO OTHER COMPONENTS, (STABILIZER BARS), REQUIRED.



D4 SUSPENDED LAY-IN CEILING GRID

SCALE: NOT TO SCALE

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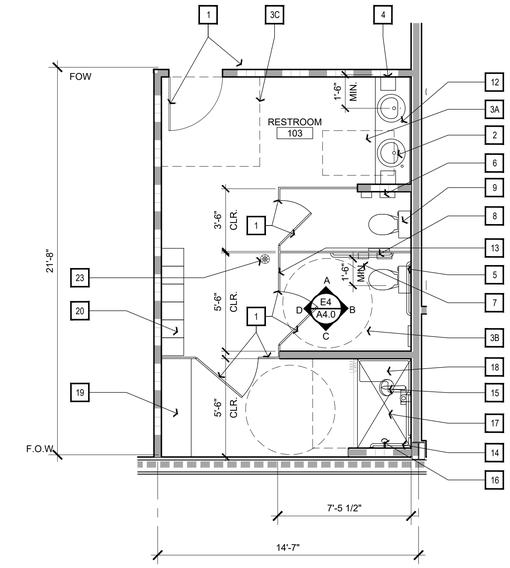
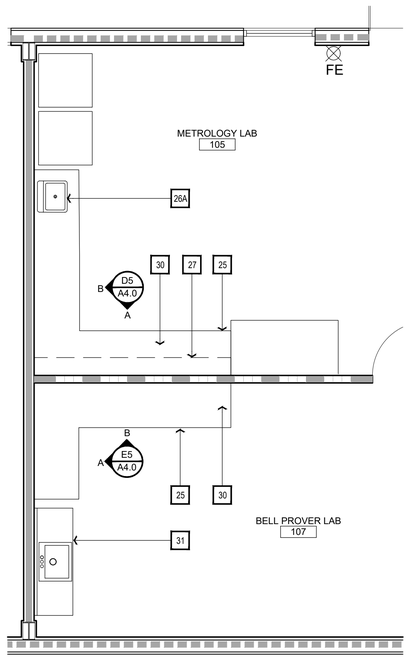
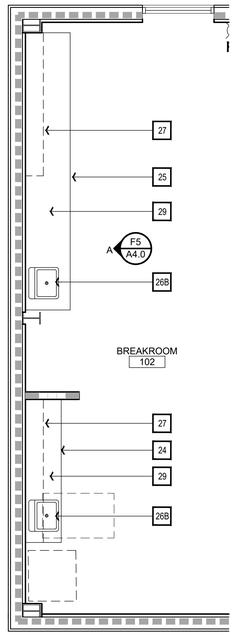


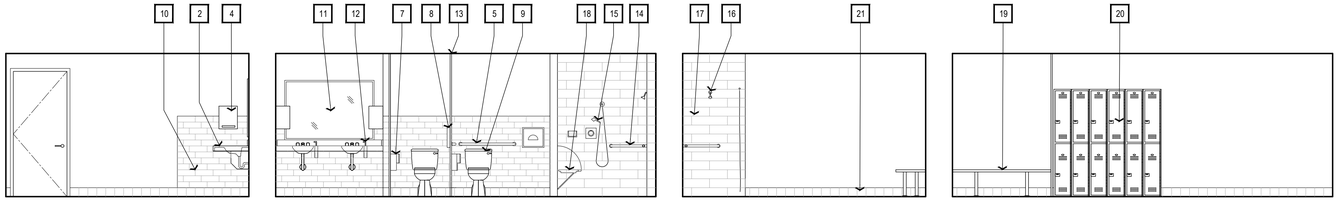




NORTH

F3 ENLARGED RESTROOMS & CASEWORK

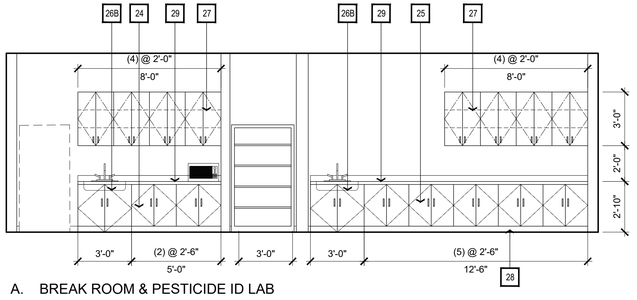
SCALE: 1/4" = 1'-0"



A. RESTROOM B. RESTROOM C. RESTROOM D. RESTROOM

F4 RESTROOM ELEVATIONS

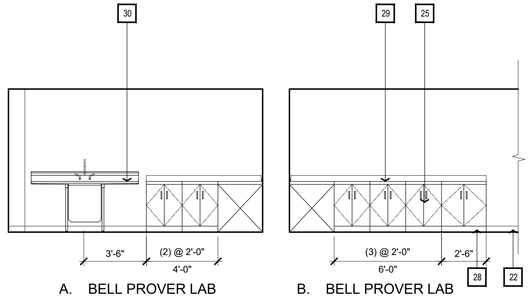
SCALE: 1/4" = 1'-0"



A. BREAK ROOM & PESTICIDE ID LAB

F5 CABINET ELEVATIONS

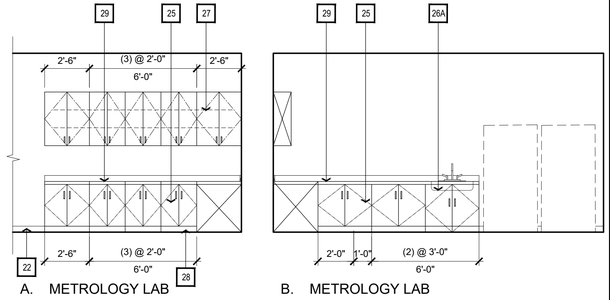
SCALE: 1/4" = 1'-0"



A. BELL PROVER LAB B. BELL PROVER LAB

E5 CABINET ELEVATIONS

SCALE: 1/4" = 1'-0"



A. METROLOGY LAB B. METROLOGY LAB

D5 CABINET ELEVATIONS

SCALE: 1/4" = 1'-0"

FINISH SCHEDULE:

	ROOM NAME	FLOOR	BASE	WALLS* N	WALLS* S	WALLS* E	WALLS* W	CASEWORK TOP	CASEWORK FRONT	CEILING	NOTES
101	PESTICIDE ID LAB	F3	B1	P1	P1	P1	P1	CW1	CW3	C1	
102	BREAKROOM	F3	B1	P1	P1	P1	P1	CW1	CW3	C1	
103	RESTROOM	F3	B2	P1	P1/ WC1	P1/ WC1	P1/ WC1	CW1		C2	
104	TRAINING SUPPLY RM	F2	B1	P1	P1	P1	P1			OPEN	
104A	I.T. RM	F2	B1	P1	P1	P1	P1			C2	
105	METROLOGY LAB	F3	B1	P1	P1	P1	P1	CW2	CW3	C1	
106	WATER TESTING	F2	B1	P1	P1/ WC2	P1	P1/ WC2			C1	N1
107	BELL PROVER LAB	F3	B1	P1	P1	P1/ WC2	P1	CW2	CW3	C2	N1
108	MAINTENANCE SHOP	F2	B1	P1	P1	P1	P1			OPEN	
109	STORAGE	F2	B1	P1	P1	P1	P1			OPEN	
110	WELDING	F2	B1	P1	P1	P1	P1			OPEN	
111	PARKING BAYS	F1	B1	P1	P1	P1	P1			OPEN	

NOTES:

N1- 4X8 BOARD OF FRP RAN VERTICAL WHERE OCCURS.

FINISH LEGEND:

FLOORS:
- F1 CONCRETE FLOORING
- F2 POLISHED CONCRETE FLOORING
- F3 EPOXY COATED FLOORING
  MANUFACTURER: DEX-O-TEX
  COLOR: 3304 PROVINCIAL TAN

BASE:
- B1 4" RUBBER BASE
  MANUFACTURER: ARMSTONG
  COLOR: DESERT R48DS
- B2 BASE TILE
  MANUFACTURER: CROSSVILLE
  COLLECTION: STONE FICTION
  COLOR: STF02- TRAVERTINE BEIGE
  SIZE: 4 X 24

WALL COVERING:
- WC1 WALL TILE
  MANUFACTURER: CROSSVILLE
  COLLECTION: STONE FICTION
  COLOR: STF02- TRAVERTINE BEIGE
  SIZE: 12 X 24
- WC2 FRP
  MANUFACTURER: CRANE COMPOSITES
  COLLECTION : GALSSBOARD
  STYLE : SMOOTH WITH SURFASEAL
  COLOR : WHITE
  SIZE : 8'X 4' PANELS RAN VERTICALLY

WALL PAINTS:
*** PAINT TO BE SEMI-GLOSS IN THE RESTROOMS AND SATIN FINISH ALL OTHER LOCATIONS.
- P1 FIELD COLOR PAINT
  MANUFACTURER: BENJAMIN MOORE
  COLOR: NATURAL WICKER OC-1

CASEWORK:
- CW1 COUNTERTOP- SOLID SURFACE
  MANUFACTURER: WILSONART
  COLOR: QUARTZ ALVARADO Q4072
- CW2 COUNTERTOP- STAINLESS STEEL
- CW3 CABINET FACE
  MANUFACTURER: WILSONART
  COLOR: WHITE

CEILINGS:
- C1 ACOUSTICAL CEILING 2' X 4'
  MANUFACTURER: ARMSTRONG
  STYLE: CORTEGA SQUARE LAY-IN
- C2 G. WB. CEILING CEILING PAINT
  MANUFACTURER: BENJAMIN MOORE
  COLOR: SNOW WHITE 2122-70
- OPEN OPEN TO CEILING ABOVE

FINISH NOTES:

A. PAINT WALLS (1) COAT PRIMER, (2) COATS FINISH, U.N.O.

B. USE SEMI-GLOSS PAINT AT ALL WET AREAS.

C. VERIFY ALL COLORS WITH THE OWNER.

D. ADVISE ARCHITECT OF ANY COMPATIBILITY PRIOR TO INSTALL.

E. PRIMER TO BE TINTED TO MATCH FINAL COAT.

F. PREPARE AND INSTALL ALL PRODUCTS STRICTLY PER MANUFACTURERS SPECIFICATIONS.

SHEET NOTES:

A. VERIFY ALL FINISHES, EQUIPMENT AND HARDWARE WITH OWNER.

B. PROVIDE HORIZONTAL BACKING FOR WALLS WITH WALL MOUNTED CASEWORK OR EQUIPMENT.

C. FOR ACCESSIBILITY NOTES AND DETAILS SEE SHEET A0.3.

D. MILLWORK IS SHOWN FOR GENERAL REFERENCE ONLY. CABINET FABRICATOR IS RESPONSIBLE FOR COORDINATING CABINET DESIGN WITH LESSOR/ LESSEE AND FOR PROVIDING SHOP DRAWINGS FOR FINAL DESIGN APPROVAL TO LESSOR/ LESSEE.

E. ALL MILLWORK SHALL BE CONSTRUCTED PER THE WOODWORK INSTITUTE'S "CUSTOM GRADE" SPECIFICATIONS. CONTRACTOR TO PROVIDE SHOP DRAWINGS TO ARCHITECT FOR APPROVAL PRIOR TO FABRICATION OF CASEWORK.

F. ALL EXPOSED AND SEMI-EXPOSED SURFACES SHALL BE PLASTIC LAMINATE, SOLID SURFACE, OR PHENOLIC RESIN PER FINISH SCHEDULE. ALL CONCEALED SURFACES SHALL BE MELAMINE OR APPROVED EQUAL LOW-PRESSURE LAMINATE.

G. INTERIOR SHELVES SHALL BE ADJUSTABLE WITH PEGGED SUPPORTS.

H. ALL PULLS ON DRAWERS AND DOORS TO BE 4" WIRE PULLS, U.N.O.

KEY NOTES:

1. INSTALL WALL MOUNTED TACTILE SIGNAGE ON THE LATCHSIDE OF THE DOOR AND DOOR MOUNTED PICTOGRAM SIGNAGE. SEE DETAIL C2/A0.3. TO BE PROVIDED AT MAIN RESTROOM DOOR, EACH INDIVIDUAL TOILET ROOM, AND SHOWER ROOM.
2. INSTALL 2'-0" DEEP COUNTER WITH BACKSPLASH AND RETURN WITH ACCESSIBLE SINK. SEE DETAIL C3/A0.1.
3. DASHED LINES INDICATES 5" DIA ACCESSIBLE CLEAR MANEUVERING SPACE.
   3A. 2'-6" X 4'-0" ACCESSIBLE CLEAR SPACE.
   3B. 5'-0" DIA. ACCESSIBLE CLEAR SPACE AND TURN AROUND AT WATER CLOSET.
   3C. 5'-0" X 5'-0" ACCESSIBLE CLEAR DOOR LANDING SPACE.
4. INSTALL WALL MOUNTED PAPER TOWEL DISPENSER
5. INSTALL STAINLESS STEEL GRAB BARS: 4'-0" LONG X 1 1/2" Ø GRAB BAR ON THE SIDE WALL AND 3'-0" LONG X 1 1/2" Ø GRAB BAR ON THE BACK WALL OF THE WATER CLOSET.
6. INSTALL SURFACE MOUNTED SANITARY NAPKIN DISPOSAL.
7. INSTALL SURFACE MOUNTED DUAL-ROLL TOILET PAPER ROLL DISPENSER.
8. INSTALL SURFACE MOUNTED TOILET SEAT COVER DISPENSER.
9. INSTALL ACCESSIBLE WATER CLOSET WITH FLUSH ON WIDE SIDE OF THE STALL.
10. WALL TILE WAINSCOT TO +4'-0" OVER 6" HIGH BASE TILE.
11. STAINLESS STEEL FRAMED MIRROR WITH BOTTOM OF REFLECTIVE SURFACE AT +3'-4" MAX. A.F.F.
12. COUNTER MOUNTED SOAP DISPENSER.
13. FULL HEIGHT TOILET PARTITION, SCRANTON PRODUCTS ARIA PARTITIONS OR SIMILAR . SEE FINISH NOTES FOR ADDITIONAL INFORMATION.
14. SHOWER GRAB BARS
15. ACCESSIBLE SHOWER WAND
16. STANDARD SHOWER HEAD
17. SHOWER WALL TILE AND FLOOR TILE
18. SHOWER ADA SEAT
19. 5'-6" X 1'-8" ACCESSIBLE BENCH FOR CHANGING ROOMS
20. (6) 12"X15"X36" DOUBLE TIER, TWO DOOR LOCKERS
21. 6" HIGH TILE BASE.
22. 4" RUBBER BASE.
23. 2" DIA. FLOOR DRAIN. SLOPE FLOOR LOCALLY TO DRAIN.
24. 2'-0" DEEP MAX P.LAM FACED BASE CABINETS WITH ADJUSTABLE SHELVED AND DRAWERS WITH ACCESSIBLE PULLS.
25. 2'-6" DEEP MAX. P.LAM FACED BASE CABINETS WITH ADJUSTABLE SHELVES AND DRAWERS WITH ACCESSIBLE PULLS.
26. ACCESSIBLE SINK WITH CABINET OPEN TO BELOW TO HAVE INTEGRAL KICK. WRAP EXPOSED PLUMBING PIPING. SEE DETAIL C2/A0.1.
    26A. INCLUDING A 3/4 HP GARBAGE DISPOSAL
    26B. INCLUDING A 1 HP GARBAGE DISPOSAL
27. 1'-0" DEEP P.LAM. FACED UPPER CABINETS WITH ADJUSTABLE SHELVES.
28. 4" HIGH TOE SPACE WITH TOPSET BASE.
29. COUNTERTOP PER FINISH SCHEDULE
30. STAND ALONE DEEP SINK WITH FLOOR SINK

Comstock Johnson
ARCHITECTS INC.
10520 Armstrong Avenue
Mather, CA 95655
Phone: 916 362-6303
Fax: 916 362-5841

Daniel P. Eriksson
Architect
Kevin L. Wilcox
Architect

LICENSED ARCHITECT DANIEL PAUL ERIKSSON No. C 19641 REN. 7/2025 STATE OF CALIFORNIA

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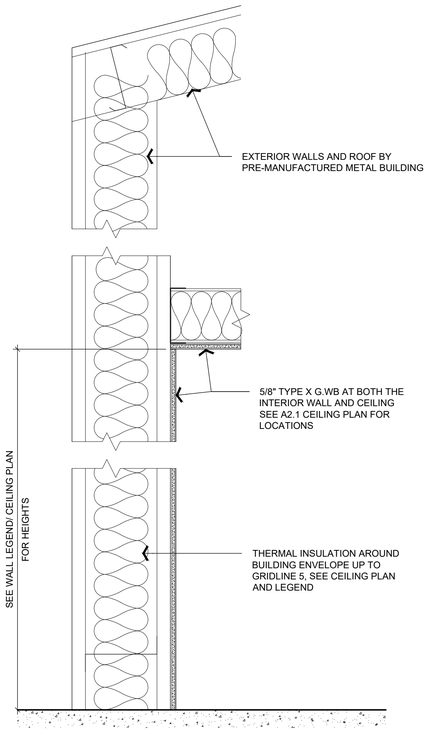
CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

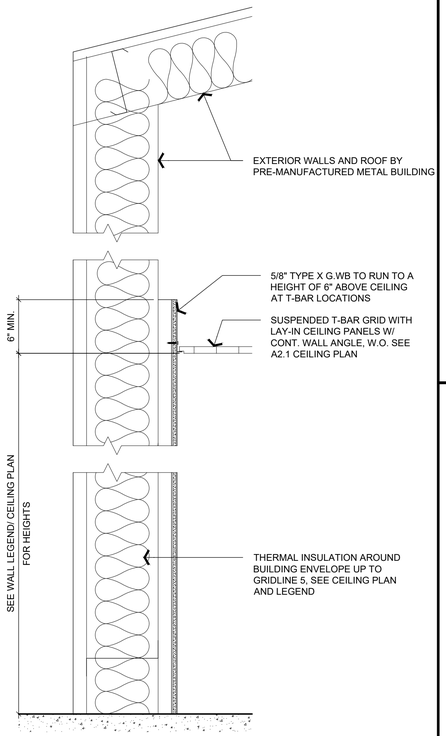
	DATE:	DESCRIPTION:
1	01/10/24	LANDSCAPING
2	03/22/24	FINISHES

DATE 12.09.22
DRAWN JDC/DH
JOB NO. 21027
SHEET A4.0
ENLARGED PLANS
OF 15 SHEETS



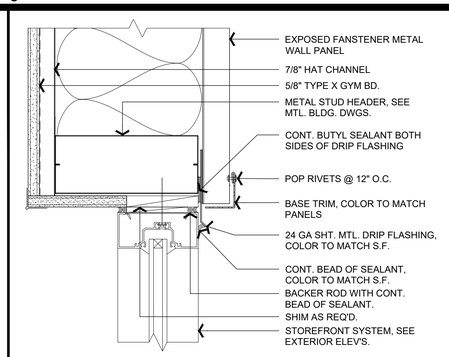
F3 FULL HT. PARTITION AT LAY-IN CLNG.

SCALE: 1 1/2" = 1'-0"



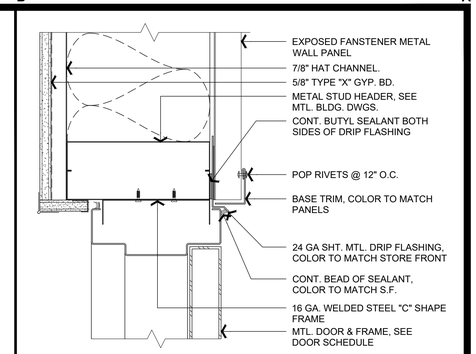
E3 FULL HT. PARTITION AT LAY-IN CLNG.

SCALE: 1 1/2" = 1'-0"



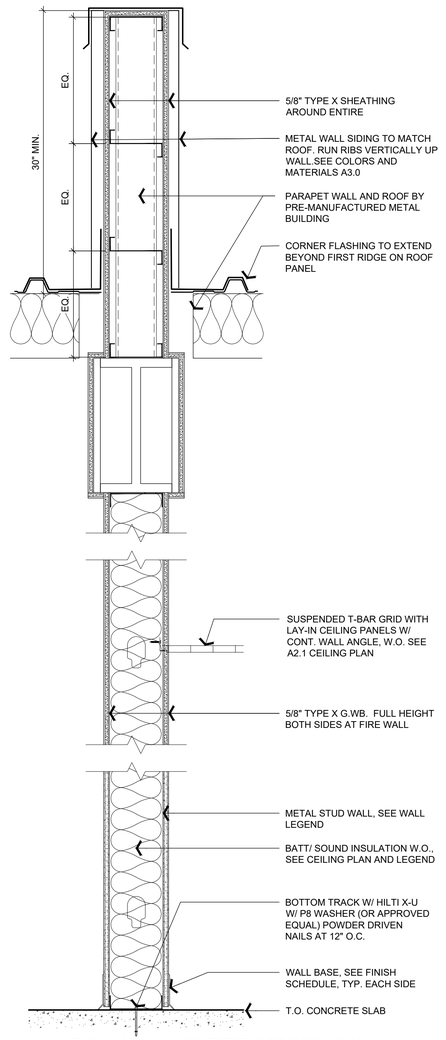
C2 METAL PANEL AT WINDOW HEAD

SCALE: 3" = 1'-0"



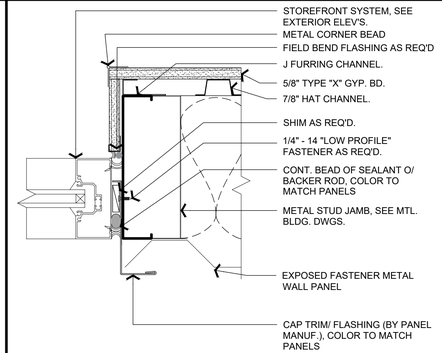
B2 METAL PANEL AT DOOR HEAD

SCALE: 1-1/2" = 1'-0"

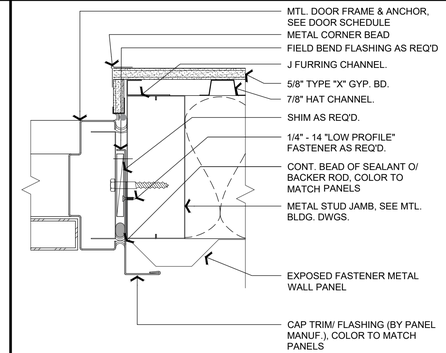


D5 FULL HT. 1 HR FIRE DEMISING WALL

SCALE: 1 1/2" = 1'-0"

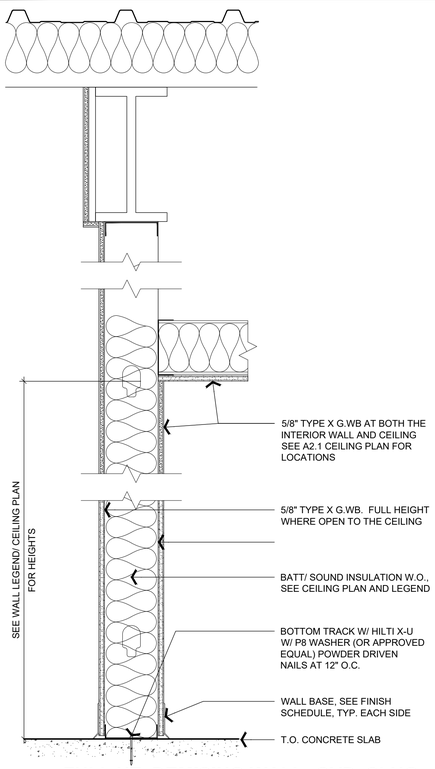


C3



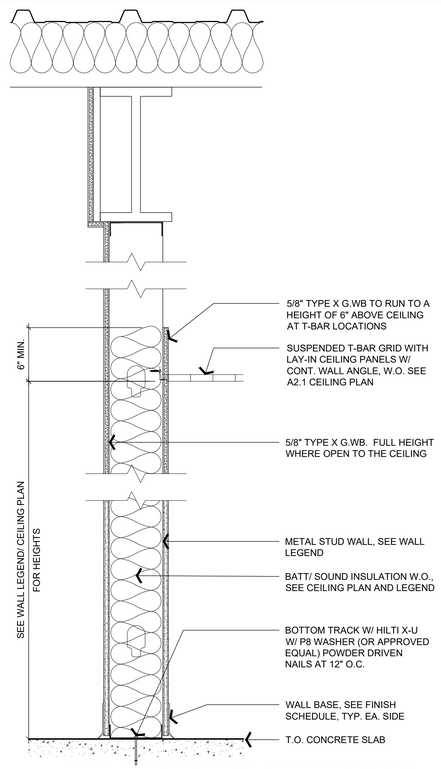
B3 METAL PANEL AT DOOR JAMB

SCALE: 1-1/2" = 1'-0"



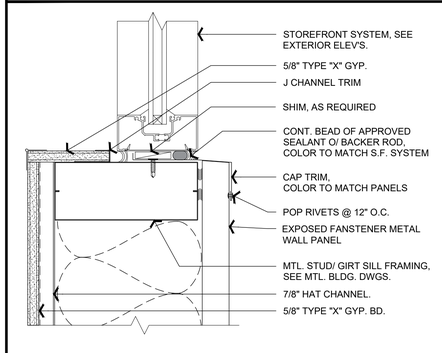
F5 FULL HT. DEMISING WALL- GYP. CLNG.

SCALE: 1 1/2" = 1'-0"



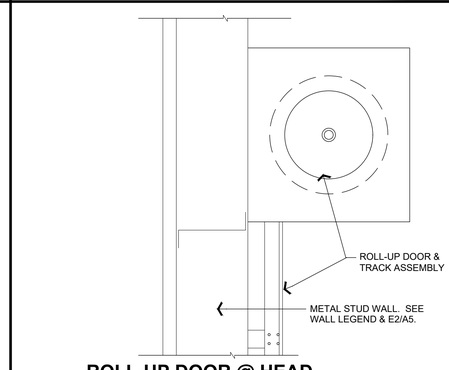
E5 FULL HT. PARTITION AT LAY-IN CLNG.

SCALE: 1 1/2" = 1'-0"



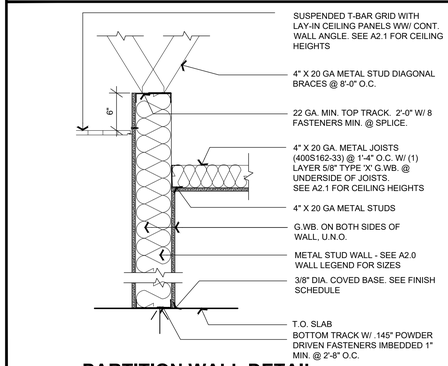
C4 METAL PANEL AT WINDOW SILL

SCALE: 3" = 1'-0"



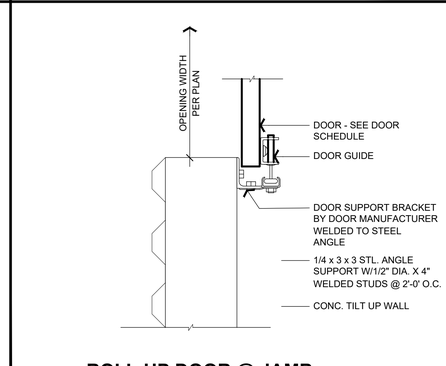
B4 ROLL-UP DOOR @ HEAD

SCALE: 1-1/2" = 1'-0"



C5 PARTITION WALL DETAIL

SCALE: 1" = 1'-0"



B5 ROLL-UP DOOR @ JAMB

SCALE: 1-1/2" = 1'-0"

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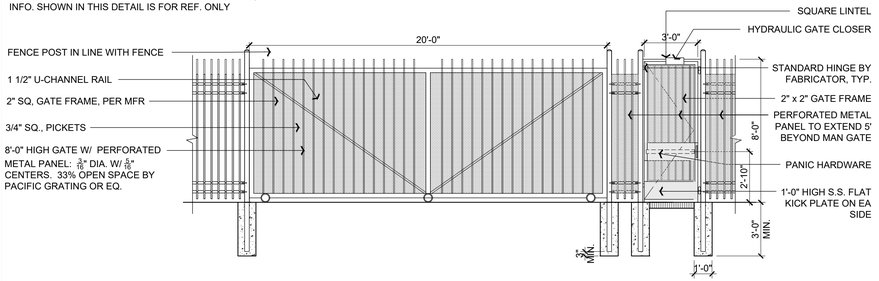
DRAWN	JDC/DH
JOB NO.	21027
SHEET	**A5.0** DETAILS
OF	15 SHEETS

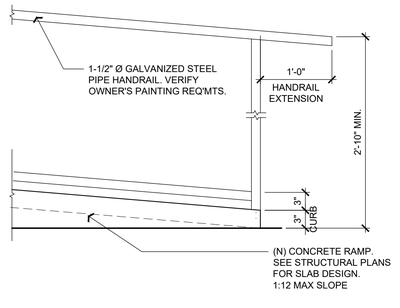
NOTE: FABRICATION AND INSTALLATION OF FENCE/ GATE AND ALL OF THE ATTACHMENTS SHALL BE DESIGN-BUILT. DETAILING AND GAGE OF ALL COMPONENTS SHALL BE PER FABRICATORS SPEC'S., INFO. SHOWN IN THIS DETAIL IS FOR REF. ONLY



F2 ENTRANCE GATES ELEVATION

SCALE: 1/4"=1'-0"

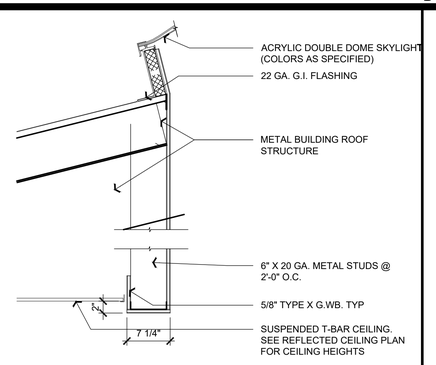
D16210_109



D2 SECTION AT ACCESSIBLE HANDRAIL

SCALE: 1" = 1'-0"

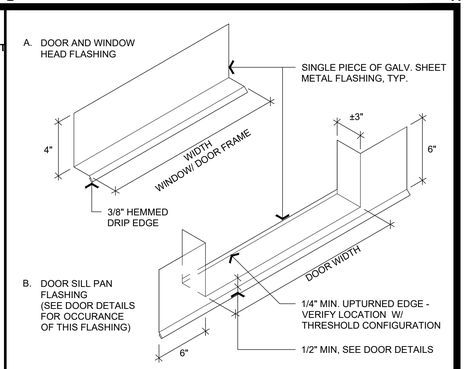
D0227708



C2 SKYLIGHT & LIGHT WELL DETAIL

SCALE: 1" = 1'-0"

D07871602.2



B2 DOOR AND WINDOW FLASHING

SCALE: 3" = 1'-0"

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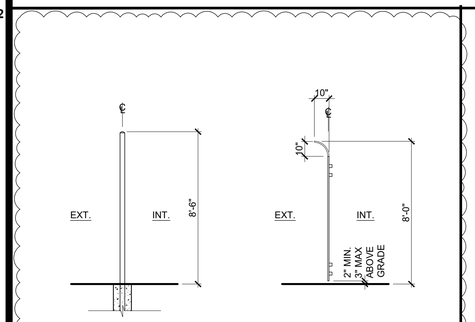
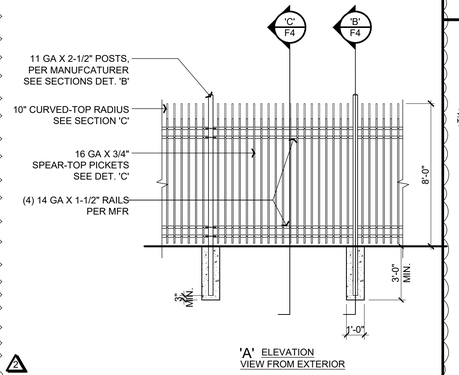


'B' SECTION B-B - POST

'C' SECTION C-C - PICKET

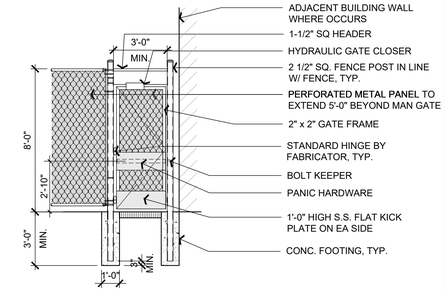


'A' ELEVATION VIEW FROM EXTERIOR

F4 DETAIL - TYPICAL FENCE PANEL

1/4" = 1'-0"

D0000000



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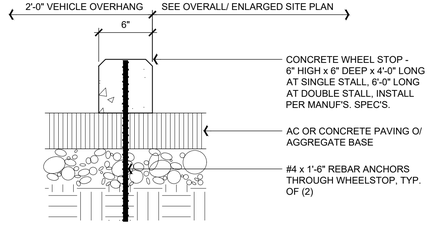
E3 SITE FENCE EXIT GATE

SCALE: 1/4" = 1'-0"

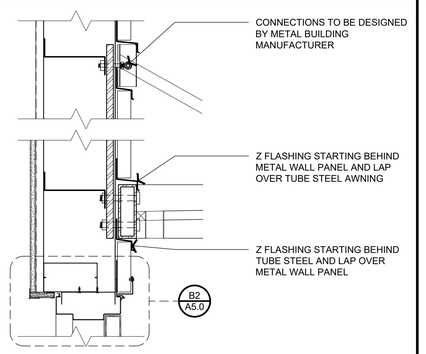
D00000 119



D3 CONCRETE WHEEL STOP

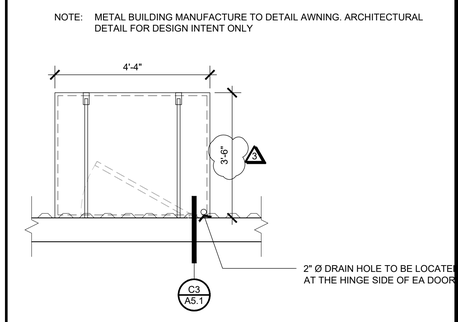
SCALE: 1 1/2" = 1'-0"

D00000 102



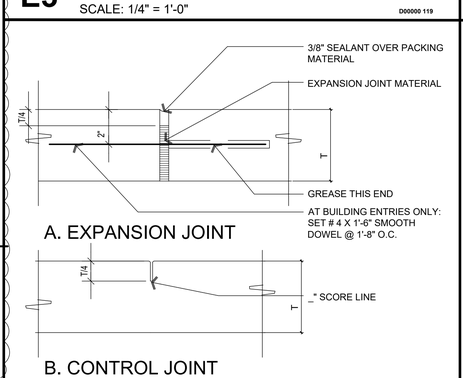
C3 ENTRANCE AWNING SECTION

SCALE: 1-1/2" = 1'-0"



B3 ENTRANCE AWNING DETAIL

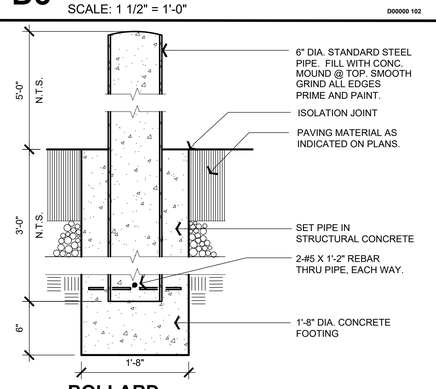
SCALE: 1/2" = 1'-0"



E4 CONCRETE CONTROL JOINTS

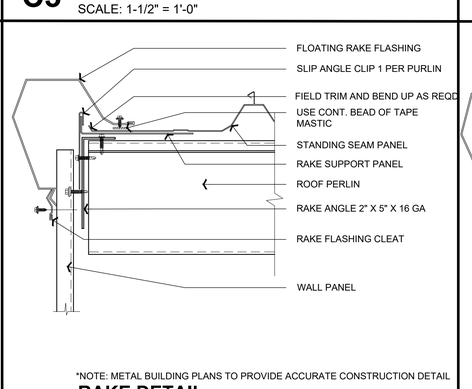
SCALE: 3" = 1'-0"

D0330001



D4 BOLLARD

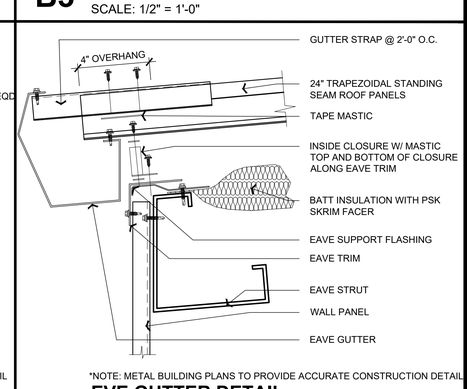
SCALE: 1 1/2" = 1'-0"



*NOTE: METAL BUILDING PLANS TO PROVIDE ACCURATE CONSTRUCTION DETAIL

C4 RAKE DETAIL

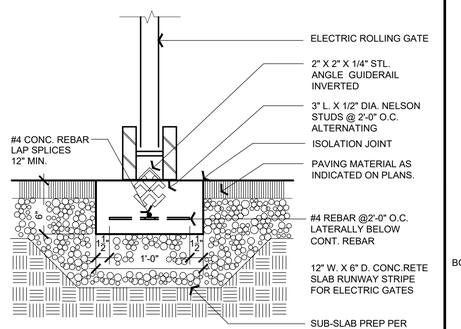
SCALE: 3" = 1'-0" FOR REFERENCE ONLY



*NOTE: METAL BUILDING PLANS TO PROVIDE ACCURATE CONSTRUCTION DETAIL

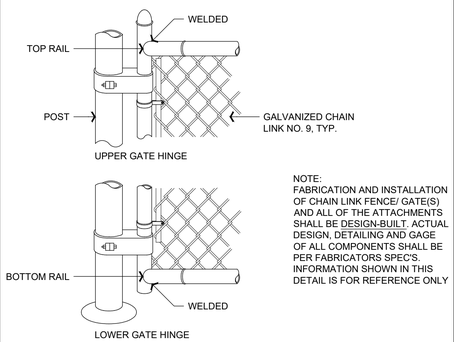
B4 EVE GUTTER DETAIL

SCALE: 3" = 1'-0" FOR REFERENCE ONLY



F5 GATE TRACK

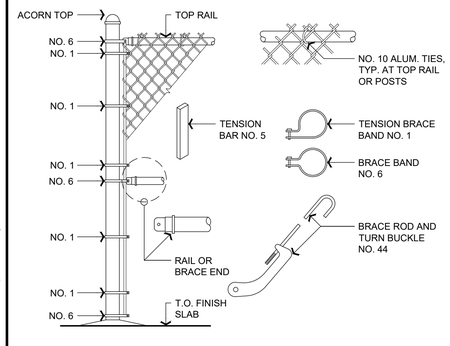
SCALE: 1 1/2" = 1'-0"



NOTE: FABRICATION AND INSTALLATION OF CHAIN LINK FENCE/ GATE(S) AND ALL OF THE ATTACHMENTS SHALL BE DESIGN-BUILT. ACTUAL DESIGN, DETAILING AND GAGE OF ALL COMPONENTS SHALL BE PER FABRICATORS SPEC'S. INFORMATION SHOWN IN THIS DETAIL IS FOR REFERENCE ONLY

E5 TYP. CHAINLINK GATE

SCALE: 1 1/2" = 1'-0"



D5 TYP. CHAINLINK FENCE

SCALE: 3/4" = 1'-0"

D00000 114

LICENSED ARCHITECT DANIEL PAUL ERIKSSON No. C 19641 REN. 7/2025 STATE OF CALIFORNIA

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COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
1	01/10/24	LANDSCAPING
2	03/22/24	FINISHES
3	07/29/24	ALL ELECTRIC

DATE	**12.09.22**
DRAWN	**JDC/DH**
JOB NO.	**21027**
SHEET	**A5.1**
OF	**15 SHEETS**

DETAILS

General

1. Interpretation of drawings & specifications
   A) For convenience, specifications have been prepared for this project and are arranged in several sections, but such separation shall not be considered as the limits of the work required by any separate trade. The terms and conditions of such limitations are wholly between the contractor and his subcontractors.
   B) In general, the working details will indicate dimensions, positions and kind of construction, and the specifications will indicate qualities and methods. Any work indicated on the working details mentioned but not in the specifications, or vice versa, shall be furnished as though fully set forth in both. Work not particularly detailed, marked, or specified, shall be the same as similar parts that are detailed, marked, or specified. If conflicts occur between drawings and specifications, the most expensive materials or methods will prevail.
   C) Should an error appear in the working details or specifications or in work done by others affecting this work, the contractor shall notify the architect at once and in writing. If the Contractor proceeds with the work so affected without having given such written notice and without receiving the necessary approval, decision or instruction in writing from the owner, then he shall have no valid claim against the owner, for the cost of so proceeding and shall make good any resulting damage or defect. No verbal approval, decision, or instruction shall be valid or be the basis for any claim against the owner, its officers, employees or agents. The foregoing includes typical errors in the specifications or notational errors in the working details where the interpretation is doubtful or where the error is sufficiently apparent as to place a reasonably prudent contractor on notice that, should he elect to proceed, he is doing so at his own risk.
2. Construction shall conform to all applicable codes and regulations.
3. Shop Drawing Note:
   A) Shop drawings shall be submitted in the form of one reproducible and two copies of each sheet.
   B) The purpose of shop drawing submittals by the Contractor is to demonstrate to the Structural Engineer that he understands the design concept by indicating which materials he intends to furnish and install, and by detailing the fabrication and installation methods he intends to use.
   C) Prior to fabrication, shop drawings shall be submitted for review to the Structural Engineer. Shop drawing submittals shall include, but are not necessarily limited to structural steel, reinforcing steel, glued laminated beams, and pre-fabricated wood roof framing items such as I-joists and trusses.
   D) Prior to submission the Contractor shall review all submittals for conformance with the contract documents and shall stamp submittals as being "Reviewed for Conformance".
   E) Shop drawing submittals processed by the Structural Engineer are not change orders.
   F) Any detail on the shop drawing that deviates from the contract documents shall clearly be marked with the note "This is a Change".
   G) Shop drawings or calculations submitted for review that require resubmittal for re-review shall be billed hourly for such time to the General Contractor. Re-review will not proceed without written approval from the General Contractor for additional engineering review services.
4. Safety Note:
   A) It is the Contractors responsibility to comply with the pertinent sections, as they apply to this project, of the "Construction Safety Orders" issued by the State of California latest edition, and all OSHA requirements.
   B) The owner and the Structural Engineer do not accept any responsibility for the Contractor's failure to comply with these requirements.
   C) The Contractor shall be responsible for adequate design and construction of all forms and shoring required.
5. The Contractor shall notify the Architect and Structural Engineer where a conflict or a discrepancy occurs between the structural drawings and any other portion of the contract documents or existing field conditions. Such notification shall be given in due time so as not to affect the construction schedule. In case of a conflict between structural drawings and specifications, the more restrictive condition shall take precedence unless written approval has been given for the least restrictive. Contractor shall verify all dimensions with architectural and structural drawings prior to commencing any work.
6. Where no specific detail is shown, the construction shall be identical or similar to that indicated for like cases of construction on this project. Should there be any question, contact the Architect and Structural Engineer prior to proceeding.
7. When construction attaches to an existing building, a complete set of drawings of the existing building shall be kept on the job site. Contractor to obtain these drawings from the owner.
8. Contractor shall provide an allowance equal to 2% of the bid for structural steel, misc. iron, light gauge framing, and reinforcing steel to be used at the discretion of the structural engineer. Unused amount to revert to the owner upon completion of the job.
9. Any substitutions for structural members, hardware, or details shall be reviewed by the Architect and Structural Engineer. Such review will be billed on a time and materials basis to the General Contractor with no guarantee that the substitution will be allowed.
10. Do not scale drawings. Contact the Architect or Structural Engineer for any dimensions not shown.
11. These drawings are not complete until reviewed and accepted by the local building official and signed by the owner and the Structural Engineer.
12. All drawings and written material appearing herein constitutes the original and unpublished work of the Structural Engineer and the same may not be duplicated, used or disclosed without written consent of the Structural Engineer.
13. The structure shown on these drawings is structurally sound only in its completed form. The stability of this structure depends on the diaphragms and the bracing members shown. The Contractor is to provide for the design and construction of shoring for all earth, forms, concrete, steel, wood, and masonry to resist gravity, earth, wind, seismic, and construction loads. Shoring shall remain in place until all diaphragms and lateral resisting elements are in place in their entirety. Construction materials shall be spread out if placed on framed floors or roofs. Load shall not exceed the design live load per square foot.

Design Criteria

1. Code: 2022 California Building Code (CBC)
2. Design Live Loads:

	Area	Live Load	Remarks
	Roof		
	A) Flat to < 4:12	Lr = 20 psf	Reducible per code
	B) 4:12 to ≤ 12:12	Lr = 12-20 psf	Reducible per code

3. Snow Design Parameters: N/A
4. Wind Design Parameters:

Basic Design Wind Speed (3-sec gust)	V = 93 mph
Nominal Design Wind speed (3-sec gust)	Vasd = 72 mph
Risk Category	II
Exposure Category	C
Internal Pressure Coefficient	±0.18
Analysis Method	Directional Procedure

5. Earthquake Design Parameters:

5.1. Seismic Importance Factor	Ie = 1.0
5.2. Risk Category	II
5.3. Soil Site Classification	D*
5.4. Seismic Design Category	D*
5.5. Mapped Spectral Response Accel	
A) Short period	S_s = 1.073g
B) 1-sec period	S_1 = 0.366g
5.6. Design Spectral Response Accel	
A) Short Period	S_{DS} = 0.859g
B) 1-sec period	S_{D1} = 0.472g
5.7 Seismic Force Resisting System	By Mfr Bldg Mfr
5.8 Seismic Base Shear	By Mfr Bldg Mfr
5.9 Seismic Response Coefficient	By Mfr Bldg Mfr
5.10 Component Response Modification Factor	By Mfr Bldg Mfr
5.11 Analysis Procedure	Equivalent Lateral Force

Foundations

1. Foundation construction shall be done in accordance with the 2022 CBC & all local ordinances.
2. All building pad preparation and foundation work shall be done in accordance with the requirements of the 2022 CBC.
3. The Inspection Agency shall observe all footing excavations prior to placement of reinforcing steel and concrete.
4. Foundation depths indicated on plans are below undisturbed/compacted, non-expasive soil. Unexpected soil conditions shall be brought to the Architect's attention immediately.
5. When structural observation is required, structural engineer shall observe footing reinforcing steel prior to concrete placement. Provide 48 hours notice to structural engineer prior to concrete placement.
6. The contractor shall be solely responsible for all excavation procedures including, but no limited to, lagging, shoring and protection of adjacent property, structures, streets, and utilities in accordance with the local building department.
7. Foundation type: conventional spread footings
8. Spread footing design values:

Allowable Bearing Pressure

Basic Load Combinations	1500 psf
Alt ASD w/ wind or seismic	2000 psf

Lateral Resistance

Passive Pressure	100 psf/ft below natural grade (up to 15')
Coefficient of Friction	N/A

Minimum Footing Dimensions

Depth = 12"
Width = 12"

Prefabricated Metal Building

1. Design and fabrication shall conform to the 2022 California Building Code (CBC), and the latest editions of AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel Buildings", and AISC "Specifications for the Design of Cold-Formed Steel Structural Members".
2. Metal Building Manufacturer (MBM) shall be AISC category 'MB' certified.
3. Drawings, calculations and engineering data on structural sections for all components shall be submitted to the Owner for review prior to fabrication. See Design Criteria Notes for loading information.
4. Calculations and drawings shall be signed by a Civil or Structural Engineer registered in the state in which the project is located.
5. Building manufacturer shall provide plan drawing showing column locations and anchor bolt locations prior to fabrication. Anchor bolt sizes, numbers, and locations are to be designed and detailed by MBM. MBM shall furnish required anchor bolts and setting templates.
6. Contractor shall verify all dimensions with Architectural drawings and MBM column layout prior to foundation construction.
7. All hardware required for connecting building components shall be designed, detailed and provided by building manufacturer.
8. Contractor shall provide temporary erection bracing as required.
9. Building designer shall account for the weight of all mechanical equipment in the design of all building components which support such units.
10. Foundation design is based on preliminary evaluation of metal building reactions. Final building reactions are to be submitted to the Owner for validation of foundations prior to construction. The foundation design may need to be revised to meet the final building reactions.

Structural Deferred Submittals

1. Deferred submittals shall conform to the 2022 CBC.
2. The following are structural deferred submittal items:
   A. Pre-manufactured Metal Building
   B. Sprinklers
   C. Foundation Design (shown for bidding purposes only)
3. The submittal shall include but shall not be limited to layout drawing, any necessary sections and/or details, and design calculations stamped and signed by a Professional Engineer licensed in the State of California.
4. Submittal documents for deferred submittal items shall be submitted to the Architect or Engineer of Record for review prior to submission to the Building Official.
5. Ten working days shall be allowed for the Architect or the Engineer to review each deferred submittal.
6. The deferred submittal items shall not be installed until their design and submittal documents have been approved by the Building Official.
7. Deferred submittals shall be made for enough in advance such that no delay in construction occurs.

Expansion Anchors-Concrete: (Stainless Steel)

1. Use Hilti Kwik Bolt-TZ Expansion Anchors as manufactured by Hilti Inc., Tulsa Oklahoma. ICC-ES Report No. ESR-1917 relssued May 2022.
2. Installation of anchors shall be in accordance with the manufacturer's recommendations, ICC-ES Report, and these notes.
3. Special Inspection is required in accordance with the 2022 CBC Sections 1705A.1.1.3 and 1910A.5. Special inspector must verify product, expiration date, concrete type and strength, anchor diameter and steel grade, compliance of drill bit, hole diameter and location, cleanliness of hole and anchor, and anchor embedment.
4. Each anchor type (loaded in either pullout or shear) shall be torque tested in accordance with CBC Section 1910A.5 to the appropriate test load shown in the table. If any anchor fails testing, all anchors of the same type not previously tested shall be tested until 20 consecutive anchors pass, then initial testing frequency may be resumed.
5. When installing anchors in existing concrete do not cut or damage existing reinforcing bars. Locate existing reinforcing bars with pachometer or x-ray if required.
6. The testing of the anchors shall be done by the Testing Laboratory and a report of the test results shall be submitted to the Building Dept. and Architect/Structural Engineer.
7. Anchors installed up into the bottom of metal deck with concrete fill shall be installed in the center of the low flute of the decking. The decking shall have a minimum thickness of 20 gauge. The minimum depth of embedment above the top of the deck shall be 1½". The effective depth of embedment is considered to be one-third of the metal deck height plus the depth of embedment above the top of the deck. There shall be a minimum concrete cover of 1" between the top surface of the concrete and the end of the bolt.

Normal Weight Concrete Anchors
f'c = 3000 psi
Hilti Kwik Bolt-TZ Expansion Anchors — Stainless Steel Anchors

Anchor Diameter	Embed	Installation Torque Torque Test Load (ft-lbs)
⅜"	2"	25
½"	3¼"	40
⅝"	4"	60
¾"	4¾"	110

Concrete

1. Structural concrete shall attain 28-day compressive strength as required in note #30. Maximum slump shall not exceed 4".
2. Concrete mix designs shall be prepared by a registered Civil Engineer, reviewed by Owner's testing laboratory and submitted to the Structural Engineer for review. Selection of concrete mix proportions shall be per ACI 318-19 Section 26.4.3. & 26.4.4.
3. Cementitious materials:
   Cement shall conform to ASTM C-150 type I or II.
   Fly ash shall conform to ASTM C-618. Max quantity of fly ash shall be as given in specs (15% max w.o.)
4. Concrete aggregates shall conform to ASTM C-33 for normal weight concrete and ASTM C-330 for light weight concrete.
5. Water shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials or other substances deleterious to concrete or reinforcement.
6. Non-shrink grout or drypack shall consist of a premixed nonmetallic formula. See note #21 for additional information.
7. Reinforcing steel shall conform to ASTM A615-grade 60 for #4 and larger, and ASTM A615-grade 40 for #3 and smaller, except reinforcing steel to be welded shall conform to ASTM A706. Contractor shall submit rebar mill certificates.
8. Welded Wire fabric shall conform to ASTM A-1064.
9. All preheating and welding of reinforcing bars shall be done in accordance with AWS D1.4 latest edition and shall be continously inspected by a qualified laboratory. Contractor shall furnish WPS for all rebar welding to the laboratory.
10. Reinforcing steel shall be fabricated according to "Manual of Standard Practice for Reinforced Concrete Construction".
11. Dimensions shown for location of reinforcing are to the face of bars listed and denote clear coverage. Non-prestressed, cast-in-place concrete coverage shall be as follows, u.n.o.:

Cast against earth (except slabs)	3"
Cast in forms and exposed to earth or weather	
#6 & larger	2"
#5 & smaller	1½"
Beams & columns (ties)	1½"
Beams & columns (main reinf)	2"
Cast-in-place walls	
(exterior face & soil side)	see above
Cast-in-place walls	
(interior face - #11 & smaller)	¾"
Tilt-up walls	see details
Slabs (on forms)	¾"
Slabs (on ground)	2" clr from top u.n.o.

12. Splices in continuous reinforcement shall be lapped u.n.o., lap bars per note 31 u.n.o.. Splices in adjacent bars shall be greater than 5'-0" apart. Splice continuous bars in soil-bearing grade beams, structural slabs on grade and mat foundations as follows u.n.o.: top bars at centerline of support; bottom bars at mid-span. Splice continuous bars in elevated slabs and beams, etc. as follows u.n.o.: top bars at mid-span; bottom bars at centerline of support. All bars size #14 and larger shall be continuous for full length shown or spliced with mechanical couplers as noted in details. Splices in WWF shall overlap 2 squares minimum.
13. The minimum clear spacing between parallel bars in a layer shall not be less than the larger of bar diameter, 1", or 33% greater than the maximum aggregate size (nominal), whichever is greatest. This requirement also applies to the clear spacing between different layers of parallel bars and to the clear distance between a contact lap splice and adjacent splices or bars.
14. All hooks shall be standard hooks unless otherwise shown or noted. At walls, provide hooks at ends of all reinforcing ends, corners and intersections, u.n.o.
15. Provide construction/control joints @ all slabs on grade as noted on plan. Proposed joint plan shall be submitted to the Structural Engineer for approval prior to construction. Concrete surface at construction joints shall be thoroughly cleaned and laitance removed. Where indicated on drawings, roughen concrete surface to ¼" amplitude. Concrete may be roughened by chipping the entire surface, sand blasting, or raking the surface to provide ¼" deep deformations.
16. Remove all debris from forms before casting any concrete.
17. Reinforcing, dowels, bolts, anchors, sleeves, etc., to be embedded in concrete shall be securely positioned in forms before placing concrete.
18. Pipes and electrical conduits shall not be embedded in structural concrete or concrete fill over metal decking except where specifically approved by the Structural Engineer.
19. Anchor bolts (AB's) cast in concrete or masonry for wall sill and ledger/ applications shall be headed bolts with cut threads conforming to ASTM A307 or F1554 u.n.o. Refer to "Wood notes" for additional requirements for bolts in contact with pressure treated or fire retardant material. Refer to 'Structural steel' note for requirements for anchor rods cast in concrete for column base plate and steel embed applications.
20. Walls shall be cast in horizontal layers of 2'-0" maximum depth.
21. Concrete in walls, piers or columns shall set at least 2 hours before placing concrete in beams, spandrels, or slabs supported thereon.
22. Consolidate concrete placed in forms by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with the recommended practices of ACI 309 to suit the type of concrete and project conditions. Concrete shall not be dropped through reinforcing steel (as in walls) so as to cause segregation of aggregates. In such cases hoppers and chutes or trunks of variable lengths shall be used so that the free uncontined fall of concrete shall not exceed 6 feet.
23. Drill through steel columns, beams and plates to pass continuous reinforcing, u.n.o.
24. No wood spreaders allowed. No wood stakes allowed in areas to be concreted.
25. Additional reinforcing in precast or tilt-up panels required for lifting stresses shall be supplied by Contractor.
26. Provide #5x4'-0" diagonal reinforcing at mid-depth of slab at all re-entrant corners typical. This applies to slab on grade, concrete over metal deck, and elevated structural slab conditions.
27. Place non-shrink grout under base plates, sill plates, etc as indicated on the drawings. Non-shrink grout shall be Masterflow 928 Grout by Master Builders Technologies or approved equal with a minimum f'c of 7500 psi @ 28 days.
28. All saw cutting shall be done after initial set has occurred to avoid tearing or damage by the saw blade, but before initial shrinkage has occurred.
29. Notify Structural Engineer a minimum of 48 hours before placing any concrete.
30. Concrete strength: (max slump = 4")

Use	f'c @ 28 days	Max Aggregate Size	Density (lbs/ft³)	Max W/C Ratio
Foundations	3000 psi	1½"	145	0.58
Slab-on-grade	3500 psi	1"	145	0.45
Exterior Flatwork	2500 psi	1"	145	0.60

31. Development lengths shall be provided per the table below unless noted otherwise.

Bar	Straight Bars f'c 3000 psi	Straight Bars f'c 4000 psi	Bar	With Standard Hooks f'c 3000 psi	With Standard Hooks f'c 4000 psi
#3	15"	21"	#3	6"	6"
#4	24"	25"	#4	11"	10"
#5	36"	31"	#5	14"	12"

Structural Steel

1. Fabrication, erection and materials shall conform to the specifications and standards of the AISC, as contained in the "AISC 360-16 Specifications of Structural Steel Buildings" & the "AISC Manual of Steel Construction", 15th edition and California Building Code latest edition.
2. Structural steel shall conform to the following specifications, u.n.o.:

Shapes	
Wide Flanges (W, WT)	ASTM A992
Wide Flanges (S, M), Angles (L)	ASTM A572
Channels (C), Misc. Channels (MC)	ASTM A36 (t≤8"), ASTM A992 (>8")
Hollow Structural Steel (HSS)	ASTM A500, Gr. C (Fy = 50 ksi)
Steel Circular Pipes (P)	ASTM A53, Type E or S, Gr. B
Plates & Bars	
Column Base Plates	ASTM A36
Brace Gusset Plates	ASTM A36
Beam Shear Connection Plates	ASTM A36
Column Continuity Plates	ASTM A572, Gr. 50
Beam Stiffener Plates	ASTM A36
Deck Closure Plates	ASTM A36
Stainless Steel Plates & Bars	ASTM A276
Other	ASTM A36
Nuts, Bolts, Rods, & Washers	
General Bolts	ASTM F3125, Gr A325-N
Slip Critical Bolts (see note #4 below)	ASTM F3125, Gr A325-SC
High Strength Bolts	ASTM F3125, Gr A325-N or Gr A490
Machine Bolts (general use)	ASTM A307
Bent & Headed Anchor Bolts	ASTM F1554, Gr. 36, 55, or 105
Partial & Fully Threaded Anchor Rods	ASTM F1554, Gr. 36, 55, or 105
Fully Threaded Rod (general use)	ASTM A36 (A307 Gr. A for ⅜"ø)
Welded Shear Connectors	ASTM A108, Gr. 1015 thru 1020
Welded Threaded Studs	ASTM A108, Gr. 1015 thru 1020
Nuts for Bolts & Machine Bolts	ASTM A563
Hardened Washers	ASTM F436
Unhardened Washers	ASTM F844
Plain Washers	ASTM B18.22.1
Beveled Washers	ASTM B18.23.1

3. Bolted connections shall consist of unfinished bolts per the table above unless noted otherwise. Anchor bolts cast in concrete or masonry shall be headed bolts with cut thread, full diameter body style conforming to ASTM F1554 u.n.o. Unless noted otherwise, anchor bolts/rods shall be grade 36 except that welded anchor bolts shall be grade 55 per SI Supplementary requirements. All bolted connections and base plates shall have standard cut washers unless noted otherwise. Washers at base plates shall be placed at top and bottom of plate.
4. "Slip-critical" bolted connections:
   A) "Slip-critical" connections (A325-SC design values with special inspection) are required at all braced frame connections, at all connections along chord lines and drag lines (as noted on plans), and u.n.o., at all bolts in oversized or slotted holes.
   B) The special inspector must be present during installation and tightening operation of "slip-critical" connections.
5. All structural steel shall receive minimum of one shop coat of red primer with a minimum dry film thickness of 2.0 mils. Do not shop prime or paint areas to be field welded, fireproofed, galvanized, to receive slip-critical high strength bolts, or to be embedded in concrete. Prior to priming or painting, clean structural steel in accordance with Steel Structures Painting Council (SSPC) recommendations & as required by the primer & paint manufacturer. Provide additional painting as noted in the specifications.
6. All structural steel shall be erected plumb and true to line. Temporary bracing shall be installed and shall be left in place until other means are provided to adequately brace the structure. Contractor responsible for reviewing all base plate and support conditions during erection and bracing as required. See AISC and OSHA requirements.
7. Place non-shrink grout under all base plates before adding vertical load. See Concrete Notes for non-shrink grout requirements.
8. Structural steel below grade shall have 3" minimum of concrete cover.
9. Provide ½"ø stitch bolts and ring fills, space at not more than 24" cc for all double angle members.
10. At wood to steel parallel contact, attach with ½"ø welded threaded studs at maximum 32"cc. & 6" from ends of wood member, typical unless noted otherwise.
11. Holes for unfinished bolts shall be of the same nominal diameter of the bolt plus 1/16". Use standard AISC gage and pitch for bolts except as noted otherwise. Holes for anchor bolts embedded in concrete shall be of the same nominal bolt diameter plus ⅜" unless noted otherwise.
12. Welding shall be done by the electric arc process in accordance with American Welding Society standards, using only certified welders. All groove welds shall have complete penetration unless noted otherwise. All exposed welds shall be ground smooth. All welding to be done using E70xx electrodes. In addition, welding of ASTM A572 grade 50 steel and ASTM A992 steel shall be done with electrodes capable of depositing weld metal with a maximum diffusible hydrogen content of 16ml/100g (H16). Weld lengths called for on plans are the net effective lengths required.
13. Minimum fillet welds:
    3/16" ø t < ½"
    ¼" ø t < ¾"
    5/16" ø t > ¾"
14. Welding Procedure Specifications (WPS) for shop and field pre-qualified weld joints and weld joints qualified by test shall be prepared for review prior for fabrication. All welding procedures that meet there requirements of ANS D1.1 Sec. 5.1 shall be considered as pre-qualified. Qualification testing is required when the depth of a partial penetration or complete penetration weld is 2" or greater.
15. Structural steel & fasteners that are permanently exposed to weather shall be either primed and painted or hot dipped galvanized in accordance with ASTM A123 & A153. Repair galvanizing after welding in accordance with ASTM A780.
16. When structural steel & connections will be exposed to view in the completed building, they shall be fabricated, erected & finished in compliance with Architecturally Exposed Structural Steel (AESS) guidelines & Section 10 of the AISC 303-22 "Code of Standard Practice for Steel Buildings and Bridges".

Lightgauge Metal Framing

1. All metal framing shall be formed from corrosion resistant steel conforming to ASTM A653 or ASTM A1011 with minimum yield strength of 33 ksi for 18 ga and lighter and 50 ksi for 16 ga and heavier.
2. Metal framing shown on the structural drawings shall have channel type sections with stiffened flanges.
3. Metal tracks shall be the same gauge as framing which it supports, unless noted otherwise, with minimum flange width of 1¼".
4. Galvanized coating must meet the ASTM C955 specification.
5. Factory punch-outs to be located along the centerline of the webs of the members and have a minimum center-to-center spacing of 24". Punch-outs to have a maximum width=1½", and a maximum length=4". Lightgauge framing members shall be cut such that the minimum distance between the end of the member and the near edge of the web punch-out=10".
6. All header members shall be un-punched.
7. Design properties of metal framing studs, channels & tracks shall conform to (or exceed) the Steel Stud Manufacturer's Association (SSMA) Product Technical Information catalog & ICC Report # ESR-3064P.

BEVIER STRUCTURAL ENGINEERING, INC.
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Bevier Job No:22096

REGISTERED PROFESSIONAL ENGINEER — JEFFREY R KOTACH — No. 5652 — STRUCTURAL — STATE OF CALIFORNIA

Electronically Signed On: 9/13/24

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
3	07/29/24	ALL ELECTRIC
△		
△		
△		
△		
△		

DATE 12.09.22
DRAWN -
JOB NO. -
SHEET S1.1
GENERAL NOTES
OF - SHEETS

Test and Inspections

1. Tests and Inspections shall be provided as required below and shall conform to the requirements of 2022 CBC, Chapter 17.
2. All Test and Inspections shall be performed by a certified special inspector from an established Testing & Inspection Company, unless noted otherwise. Jobsite visits by the Structural Engineer do not constitute inspections and are not a substitute for special inspection.
3. The special inspector shall observe the work indicated for conformance with the approved construction documents.
4. The special inspector shall furnish inspection reports to the building department, the engineer or architect of record, and other designated persons. All discrepancies shall be brought to the immediate attention of the contractor for correction, then, if uncorrected, to the proper design authority and to the building department.
5. The special inspector shall submit a final signed report stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved construction documents and the applicable workmanship provisions of the 2022 CBC.
6. It is the contractor's sole responsibility to see that these tests and inspections are performed.
7. Required Tests and Inspections are indicated below with a solid filled rectangle "■".
8. Continuous notation indicates the full-time observation of work requiring special inspection by an approved special inspector who is present at the work area. Periodic notation indicates the intermittent observation of work.

Tests & Documentation/Certification Required

Note: Coordinate with building department Test & Inspection form.

- ☐ A. Compact Fill
- ☐ B. Concrete mix design, cement, aggregates & admixtures
- ☐ C. Concrete strength f'c test
- ☐ D. Reinforcing steel mill certification
- ☐ E. Structural steel mill certification
- ☐ F. Structural steel, cold formed steel, and anchor bolt sampling & testing (If not properly identified)
- ☐ G. Non-destructive weld test for all complete penetration groove welds by Ultrasonic testing or Radiography
- ☐ H. Masonry strength f'm
- ☐ I. Masonry mortar, grout proportion, aggregates, additives
- ■ J. Post installed anchors: Expansion / Epoxy Anchors
- ☐ K. High strength bolts, nuts and washers
- ☐ L. End-welded studs
- ☐ M. Buckling Restrained Brace (Load Test)
- ☐ N. Beam to column moment connection
- ☐ O. Veneer bond strength test
- ☐ P. Concrete prestressing tendons and anchorage
- ☐ Q. Shotcrete preconstruction test
- ☐ R. Shotcrete strength & core test
- ☐ S. Prefabricated Items
- ☐ T. Test to support alternative designs
- ☐ U. Isolator unit prototype & production testing

Verification and Inspection	Continuous	Periodic
A. STEEL		
☐ 1. Material verification of high-strength bolts, nuts & washers	○	●
☐ 2. Inspection of high-strength bolting, bearing & typical connections	○	●
3. Inspection of Welding Structural Steel: (field/shop)		
☐ Complete & partial penetration groove welds	●	○
☐ Multi-pass fillet welds	●	○
☐ Single-pass fillet welds > 5/16"	●	○
■ Single-pass fillet welds ≤ 5/16"	○	●
☒ Floor and roof deck welds	○	●
☐ 4. Inspection of Steel Frame Joint Details for Compliance with Approved Construction Documents	○	●
☐ 5. Automatic end-weld stud shear connectors	○	●
B. CONCRETE		
■ 1. Concrete Placement	●	○
■ 2. Inspection of reinforcing steel & placement	○	●
■ 3. Inspection of anchors cast in concrete	○	●
☐ 4. Precast concrete attachments & Inserts	○	●
☐ 5. Erection of precast concrete members	○	●
C. WOOD		
☐ 1. Verify grade and thickness of sheathing	○	●
☐ 2. Verify nominal size of framing members at adjoining panel edges	○	●
☐ 3. Verify nail diameter and length, number of fastener lines, spacing between fasteners in each line and at edge margins	○	●
☐ 4. Verify positive connection of wood members supporting balcony or deck connections to exterior walls prior to concealment	○	●
D. MASONRY PLACEMENT & GROUTING	○	●
Note: refer to TMS 602-16 Tables 3 & 4		
☐ 1. Level 2 masonry inspection (Risk Categories I, II, III)		
☐ 2. Level 3 masonry inspection (Category IV, DSA, OSHPD)		
E. SOIL (by Geotechnical Engineer)		
☐ 1. Footing excavation	○	●
☐ 2. Pile/Pier foundation	●	○
☐ 3. Material verification below footing	○	●
☐ 4. Excavation verification to proper depth	○	●
☐ 5. Placement and compaction of controlled fill	●	○
☐ 6. Site preparation prior to placement of controlled fill	○	●
F. POST INSTALLED ANCHORS		
■ 1. Expansion anchor installation	○	●
☐ 2. Epoxy anchor installation	●	○

Abbreviations

addl ..... Additional
alt ..... Alternate
AISC..... American Institute of Steel Construction
APA ..... American Plywood Association
ASTM..... American Society for Testing and Materials
AWS ..... American Welding Society
AB ..... Anchor bolt
& ..... And
arch ..... Architect/Architectural
@ ..... At
b.o. ..... Bottom of
bm ..... Beam
brg ..... Bearing
btr ..... Better
btwn..... Between
blkg..... Blocking
B.S. ..... Both sides
bott ..... Bottom
BN ..... Boundary nail
clg ..... Ceiling
cc ..... Center to center
℄ ..... Center line
clr ..... Clear
col ..... Column
CP ..... Complete Penetration
conc ..... Concrete
CMU ..... Concrete masonry unit
conn ..... Connection
c.j ..... Construction Joint
cont ..... Continuous
csk ..... Countersink
C.J..... Control Joint
DL ..... Dead Load
det ..... Detail
diag ..... Diagonal
dia ..... Diameter
do ..... Ditto
D.F. ..... Douglas Fir
dbl ..... Double
dn ..... Down
dwg ..... Drawing
ea ..... Each
E.F. ..... Each Face
embed.....Embedment
EN ..... Edge Nail
E.W. ..... Each Way
elev. el...Elevation
eq ..... Equal
equip ..... Equipment
(e) ..... Existing
E.J ..... Expansion Joint
FC ..... Face of Concrete
FB ..... Face of Block
FM ..... Face of Masonry
FP ..... Face of Plywood/Sheathing
FS ..... Face of Stud
fin ..... Finish
F.F. ..... Finish floor
F.G. ..... Finish grade
flr ..... Floor
ftg ..... Footing
fnd ..... Foundation
f.o. ..... Face of
frmg ..... Framing
galv ..... Galvanized
ga ..... Gauge
glb ..... Glued-laminated beam
g.l. ..... Grid Line
hgr ..... Hanger
hdr ..... Header
ht ..... Height
HSB .....High strength bolt
HSS .....Hollow Steel Section
hk ..... Hook
horiz ..... Horizontal
I.d. ..... Inside diameter
int ..... Interior
Inv ..... Inverted
jst ..... Joist
"jh ..... Joist hanger
L.S ..... Lag screw
lt. wt. ..... Light weight
LL ..... Live Load
LLH ..... Long leg horizontal
LLV ..... Long leg vertical
LVL ..... Laminated Veneer Lumber
MB ..... Machine bolt
mfr ..... Manufacturer
max ..... Maximum
mech..... Mechanical
MI ..... Malleable iron
min ..... Minimum
misc..... Miscellaneous
mtl. ..... Metal
N.I.C. ..... Not in contract
(n) ..... New
nts ..... Not to scale
..... Number or pounds
o/ ..... Over
oc ..... On center
O.H.J. ..... Open web joist
opng ..... Opening
oppr ..... Opposite
O.H. ..... Opposite Hand
o.d. ..... Outside diameter
PP..... Partial penetration
pc ..... piece
PL ..... Plate
ply. plywd...Plywood
pcf ..... Pounds per cubic foot
psf ..... Pounds per square foot
psi ..... Pounds per square inch
PAF..... Powder Actuated Fasteners
PTDF..... Pressure Treated Douglas Fir
r, rad ..... Radius
REDW..... Redwood
reinf ..... Reinforcing
req'd ..... Required
rt ..... Root
R.O. ..... Rough opening
Φ ..... Round or diameter
sched..... Schedule
S.A.D. ..... See architectural drawings
S.E.D. ..... See electrical drawings
S.M.D. ..... See mechanical drawings
SMS..... Sheet Metal Screws
SDS..... Simpson Strong-Drive Screw
SDSTS ..... Self drilling self tapping screw
SC..... Shear Connector ¾"Φ u.n.o.)
shtg..... Sheathing
sht ..... Sheet
SMS..... Sheet metal screw
sim ..... Similar
s.o.g..... Slab on grade
□ ..... square
stagg ..... Staggered
std ..... Standard
stl ..... Steel
sstl..... Stainless Steel
stfnr..... Stiffener
struct ..... Structural
SP ..... structural plywood
SPEN ..... structural plywood edge nailing
symm ..... Symmetrical
TN ..... Toe nail
t&b ..... Top & bottom
t.o.c..... Top of concrete
t.o.f..... Top of framing
t.o.P..... Top of plate
t.o.s..... Top of Steel
t.o.w..... Top of Wall
t&g ..... Tongue & Groove
TS ..... Tube Steel
typ ..... Typical
u.n.o..... Unless noted otherwise
vert..... Vertical
v.i.f. ..... Verify in field
w/ ..... With
w/in..... Within
w/o..... Without
WS ..... Wood screw
W.P. ..... Working point
WHS ..... Welded headed studs
WWF ..... Welded wire fabric
WCLIB..... West Coast Lumber Inspection Bureau

Powder Actuated Fasteners (Shot Pins)

1. These notes govern all conditions called out on the plans as "PAF" or "shot pins", unless noted otherwise.
2. Installation, testing & inspection of all PAF's shall be in accordance with the applicable evaluation report, these plans, and any project specifications.
3. PAF's specified in these notes shall be used for dry, interior applications only.
4. Where no manufacturer is called out on the drawings, either Hilti or Simpson may be used at the contractor's option.

Hilti Anchors:

PAF's shall be manufactured by Hilti, Inc., Tulsa, Oklahoma in accordance with the ICC evaluation report referenced below.

Connected Material	Base Material	Base Material Thickness, 't'	Minimum Penetration Into Base Material (f)	Hilti Fastener	Evaluation Report (Issue Date)
Metal Decking	Steel (all grades)	18 ga ≤ 't' < 3/16"	Full	X-HSN24 (e)	ESR-2197 (11/22)
		1/4" ≤ 't' < 1/2"	Full	X-ENP-19 L15	
		1/2" & thicker	1/2"		
Cold Formed Steel (Light Gauge) & Non-Preservative Treated Wood	Steel (all grades)	3/16" ≤ 't' < 1/2"	Full	X-U w/ P8 washer	ESR-2269 (06/22)
		1/2" & thicker	1/2"		
	Normal Weight Concrete (including concrete fill over metal decking) (a)	3x penetration min	1"		
	CMU (grouted) (b) (c)				
2x Preservative Treated Wood	Concrete (d)	4½" min	1⅜"	X-CP T2	ESR-2379 (08/21)

Hilti Table Footnotes:

(a) 3" minimum edge distance & 4" minimum spacing required. Installations in concrete over metal deck may be installed either from underneath through the metal deck or from above directly into the concrete. For fasteners into the bottom of metal deck, spacing parallel to the deck flutes shall be 5.1" minimum.
(b) 4" minimum edge distance, and no more than one fastener shall be located in any given cell.
(c) Fasteners installed in the face of CMU shall be installed 1" minimum away from vertical mortar joints. At bed joints, fasteners shall not be spaced closer than 8"oc and must be installed a minimum of 8" from the end of the wall.
(d) 1⅜" minimum concrete edge distance required. Locate fastener 6" from ends of sill plates.
(e) Where X-EDNK22 THQL2 or X-EDN19 THQL2 are specified in decking manufacturer's literature, X-HSN24 may be used instead when in accordance with ICC ESR-3562 (12/1/16).
(f) Full penetration means the entire length of the tapered tip shall penetrate completely through the base material.

Simpson Anchors:

PAF's shall be manufactured by Simpson Strong-Tie Pleasanton, California in accordance with ICC Evaluation Report #ESR-2138, dated March 2022.

Connected Material	Base Material	Base Material Thickness, 't'	Minimum Penetration Into Base Material (f)	Simpson Fastener (e)
Cold Formed Steel (Light Gauge) & Non-Preservative Treated Wood	Steel (all grades)	3/16" ≤ 't' < 3/8"	Full	PDPA or PDPAT
		3/8" ≤ 't' ≤ 1/2"	Partial	
		1/2" < 't' ≤ 3/4"	0.46"	
	Normal Weight Concrete (a)(b)	3x penetration min	3/4"	
	Light Weight Concrete fill over metal decking (b)	3x penetration min	3/4" for PDPA 1" for PDPAT	
	CMU (grouted or ungrouted) (c)	1 1/4" min face shell	Full	
2x Preservative Treated Wood	Normal Weight Concrete (a)	4½" min	1 7/16"	PDPNL or PDPNL-MS

Simpson Table Footnotes:

(a) For installations in normal weight concrete, including concrete over metal deck, shall have 3½" minimum edge distance & 4" minimum spacing required .
(b) Fasteners into bottom of concrete over metal deck shall have 7/8" (1½" deck) or 1½" (3" deck) minimum to edge of deck web, 4" minimum to end of deck, & 4" minimum spacing.
(c) Fasteners shall be installed in the center of the CMU face shell and no more than one fastener shall be located in any given cell.
(d) 1¾" minimum concrete edge distance required. Locate fastener 6" maximum from ends of sill plates.
(e) All PDP and PDPA pins may be ordered w/ washers or large washers by specifying "W" or "WL").
(f) Partial penetration means at least some portion of the tapered tip shall penetrate completely through the base material. Full penetration means the entire length of the tapered tip shall penetrate completely through the base material.

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Electronically Signed On: 9/13/24

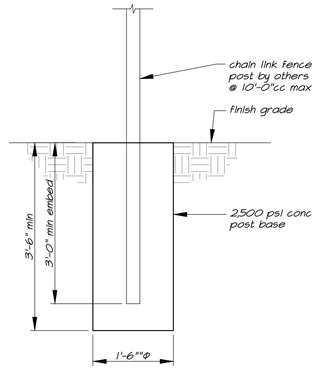
JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

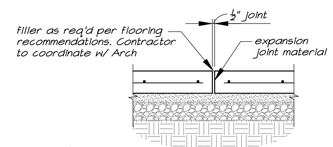
	DATE:	DESCRIPTION:
3	07/29/24	ALL ELECTRIC
△		
△		
△		
△		
△		

DATE 12.09.22
DRAWN -
JOB NO. -
SHEET S1.2
GENERAL NOTES
OF - SHEETS



7 S1.3 Typ Fence Post Ftg

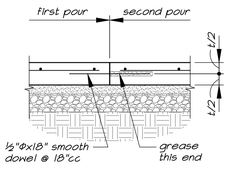
3/4"=1'-0"



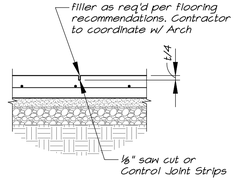
Note: Reinforcing not continuous thru joint

Expansion Joint (E.J.)
where shown on dwgs

Note:
Construction joints & control joints shall have spacing not exceeding 30 times the slab thickness without reentrant corners & with length to width ratios not exceeding 1½ to 1. Contractor shall submit layout plan showing proposed control and construction joint locations.

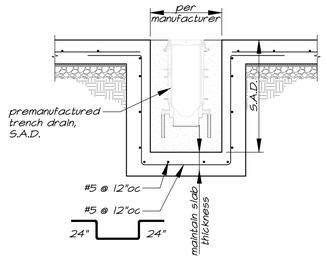


Construction Joint (C.J.)



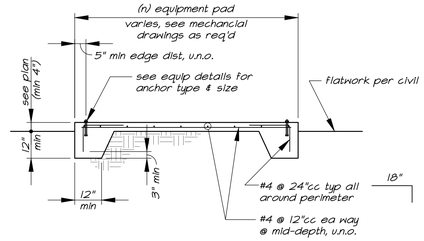
Control Joint (C.T.J.)

4 S1.3 Slab-on-Grade Joints



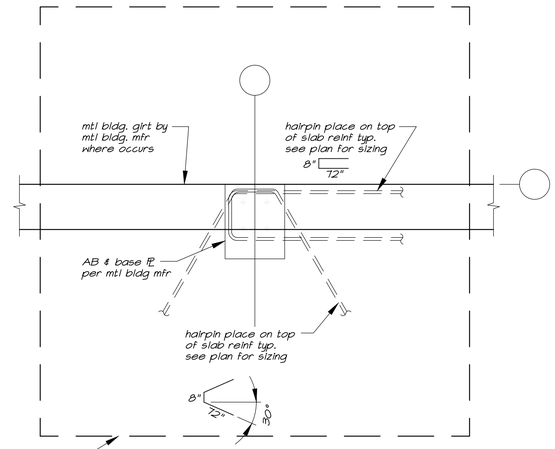
8 S1.3 Detail

½"=1'-0"



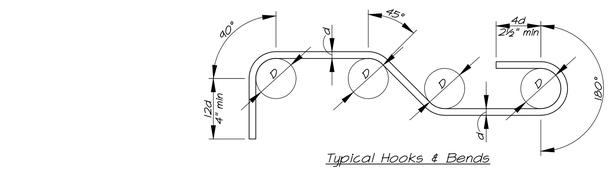
Notes:
1. Coordinate anchorage with equipment supplier.
2. Refer to General Notes sheet for installation & testing criteria for Expansion Anchors and Epoxy rebars.

9 S1.3 Conc Housekeep Pad on Grade



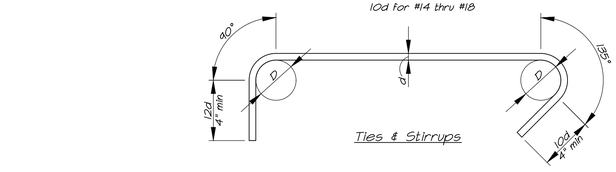
6 S1.3 Typical Hairpin

1"=1'-0"



Typical Hooks & Bends

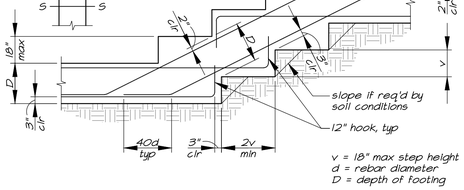
d = Rebar Diameter
D = 6d for #3 thru #8
8d for #9 thru #11
10d for #14 thru #18



Ties & Stirrups

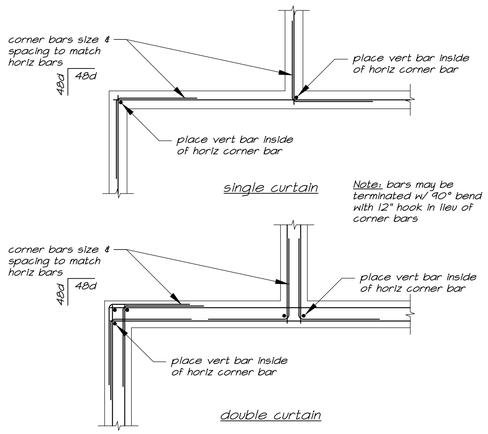
1 S1.3 Rebar Hooks & Bends

step footing as required or when indicated on foundation plan by:

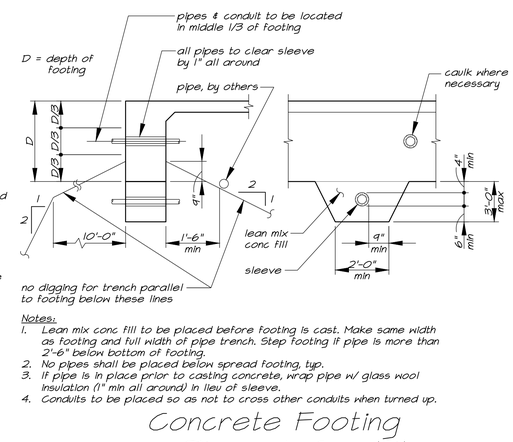


5 S1.3 Typical Footing Step

(where occurs)



2 S1.3 Typical Corner Reinforcing



Notes:
1. Lean mix conc fill to be placed before footing is cast. Make same width as footing and full width of pipe trench. Step footing if pipe is more than 2'-6" below bottom of footing.
2. No pipes shall be placed below spread footing, typ.
3. If pipe is in place prior to casting concrete, wrap pipe w/ glass wool insulation (1" min all around) in lieu of sleeve.
4. Conduits to be placed so as not to cross other conduits when turned up.

3 S1.3 Concrete Footing @ Pipes & Conduits

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Electronically Signed On: 9/13/24

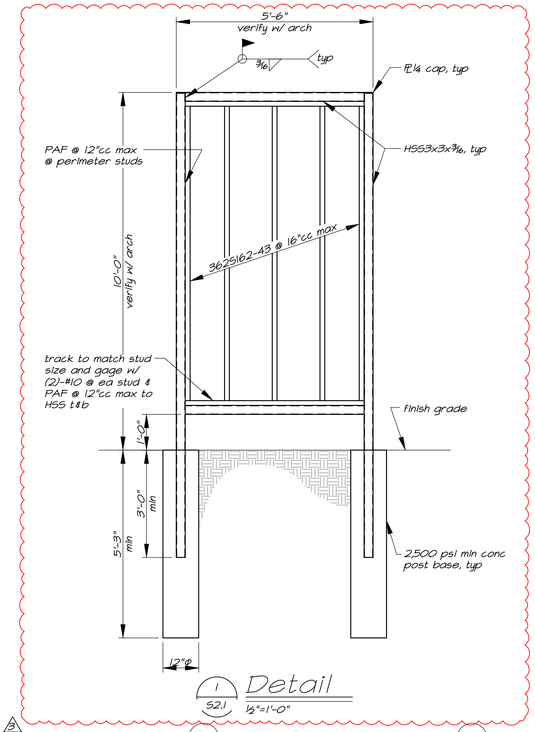
JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
3	07/29/24	ALL ELECTRIC

DATE	12.09.22
DRAWN	-
JOB NO.	-
SHEET	S1.3
	TYPICAL DETAILS
OF	- SHEETS



1 / S2.1 Detail

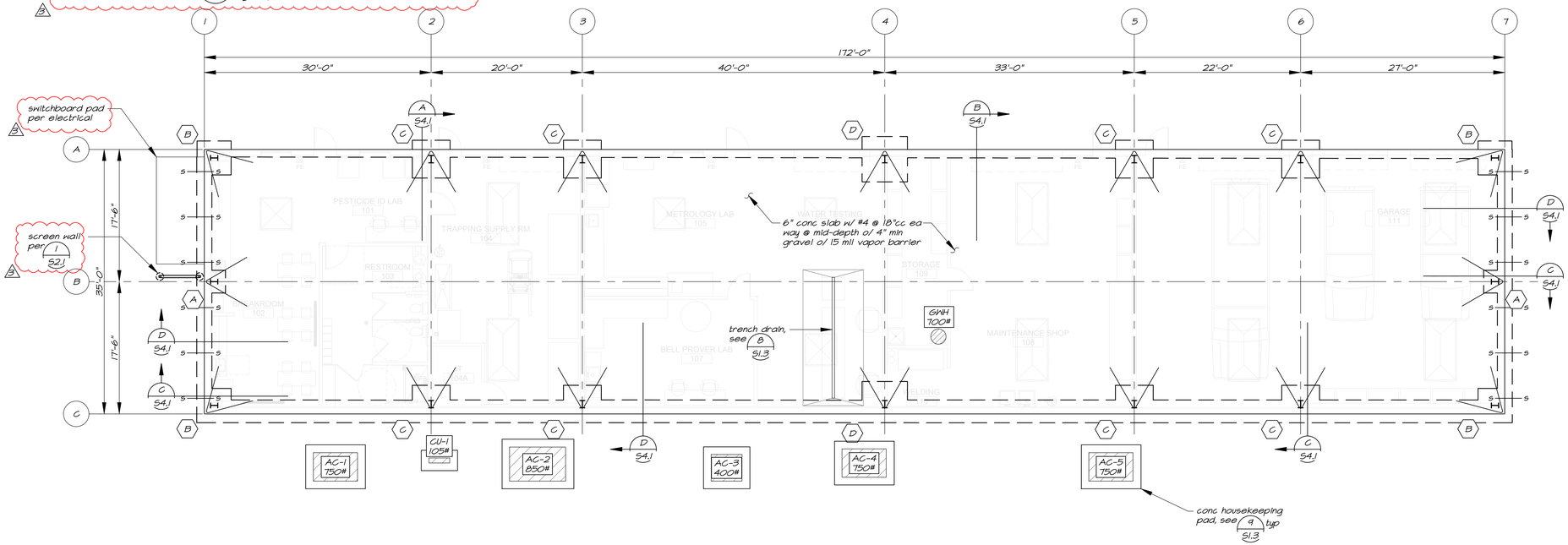
1/2"=1'-0"

Footing Schedule

Mark	Size	min depth (thickness)	Reinforcing
A	3'-0" sq	24"	3-#5 ea way @ t&b
B	4'-6" sq	24"	5-#5 ea way @ t&b
C	5'-0" sq	24"	5-#6 ea way @ t&b
D	6'-0" sq	24"	6-#6 ea way @ t&b

Foundation Notes

1. Site preparation and building pad construction shall be done in accordance with the recommendations in the 2022 California Building Code (CBC).
2. Verify all dimensions with architectural drawings. Notify Architect immediately of any discrepancies for resolution prior to proceeding.
3. Dimensions are to face of concrete (FC) typical u.n.o.
4. Continuous footings shall be 12" wide minimum u.n.o.
5. Spread footings are centered on walls, posts and columns typical u.n.o.
6. Top of concrete slab = reference elevation +0'-0".
7. Top of footing elevation = -0'-10" below reference elevation +0'-0" typical u.n.o.
8. Coordinate column size/base fl orientation w/ building manufacturer.
9. For typical reinforcing bends and corner reinforcing see 1/S1.3 & 2/S1.3
10. For pipe penetrations through continuous footings see 3/S1.3
11. Contractor to submit slab control joint layout for approval see 4/S1.3
12. -1'-0" t.o.f.t.g. Indicates top of footing elevation below reference elevation +0'-0".
13. X Indicates spread footing type, see schedule 1/S2.1
14. Indicates #5 hairpin w/ 60° splay, see 6/S1.3
15. Indicates #5 hairpin w/ 0° splay, see 6/S1.3
16. 1000# Indicates approximate weight & location of mechanical units. Coordinate locations with mechanical drawings.
17. s——s Indicates footing step location. Contractors to field verify exact step locations, see 5/S1.3



A / S2.1 Foundation Plan

1/8"=1'-0"

North

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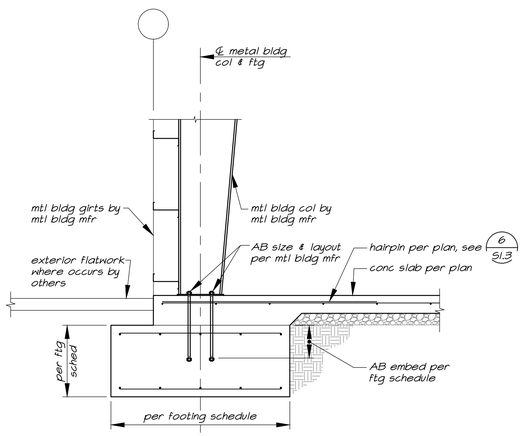
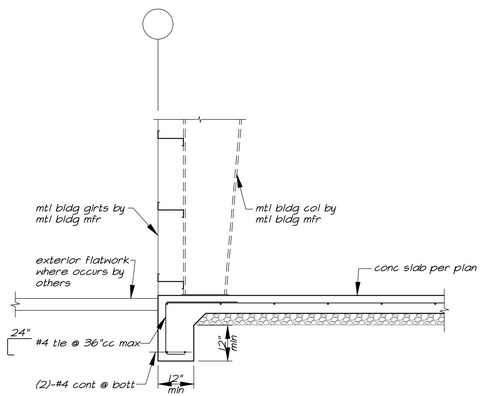
JOB NO.	-

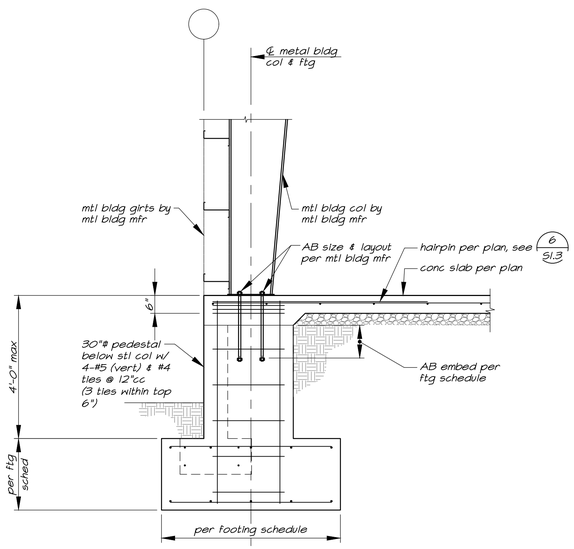
SHEET **S2.1**
FOUNDATION PLAN
OF - SHEETS



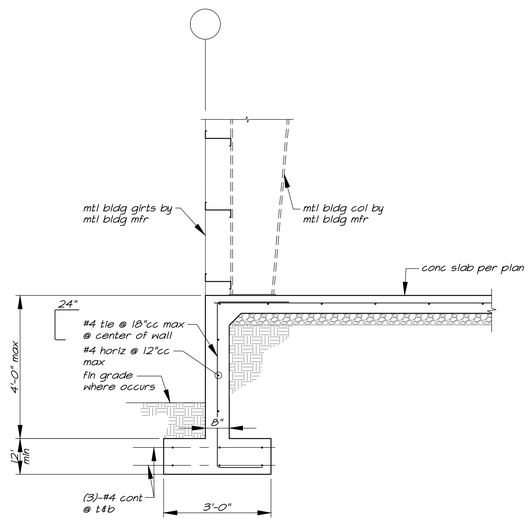
A S4.1 Section
½"=1'-0"



B S4.1 Section
½"=1'-0"



C S4.1 Section
½"=1'-0"



D S4.1 Section
½"=1'-0"

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SHEET S4.1
SECTIONS
OF - SHEETS

HVAC DUCT LEGEND

SINGLE LINE	DOUBLE LINE	DESCRIPTION
20x12	20x12	RECTANGULAR DUCT (OUTSIDE DIMENSIONS) FIRST DIMENSION LISTED ON DUCT SIZE IS THE DIMENSION IN VIEW
20x12L	20x12L	RECTANGULAR DUCT WITH ACOUSTICAL DUCT LINING (OUTSIDE DIMENSIONS)
R or D	R or D	INCLINED DUCT RISE OR DECLINED DUCT DROP IN DIRECTION OF AIR FLOW
		RECTANGULAR TO RECTANGULAR OR ROUND TO ROUND DUCT TRANSITION, MAX SLOPE 15° UON
		RECTANGULAR TO ROUND DUCT TRANSITION
		ELBOW, RECTANGULAR, WITH TURNING VANES
	W, R	ELBOW, RECTANGULAR OR ROUND, SMOOTH RADIUS R=1.5W
		CONVERGING OR DIVERGING TEE, RECTANGULAR DUCT, WITH TURNING VANES
		CONVERGING OR DIVERGING RECTANGULAR DUCT SPLIT, WITH TURNING VANES
		CONVERGING OR DIVERGING TEE WITH 45° ENTRY, RECTANGULAR MAIN AND TAP
		DIVERGING TEE, RECTANGULAR MAIN AND CONICAL ROUND TAP
		DIVERGING TEE, ROUND MAIN AND CONICAL ROUND TAP
		DIVERGING 45° WYE, ROUND MAIN AND TAP
		FLEXIBLE DUCT
		MANUAL BALANCE DAMPER
F	F	FIRE DAMPER
FS	FS	COMBINATION FIRE/SMOKE DAMPER
M	M	MOTORIZED DAMPER
		SUPPLY AIR DUCT RISE
		RETURN AIR DUCT RISE
		EXHAUST AIR DUCT RISE
		SUPPLY AIR CEILING DIFFUSER OR SUPPLY AIR DUCT DROP
		RETURN AIR CEILING GRILLE OR RETURN AIR DUCT DROP
		EXHAUST AIR CEILING GRILLE OR EXHAUST AIR DUCT DROP

HVAC LEGEND

SYMBOL	DESCRIPTION
EQ / #	EQUIPMENT TAG
#	SHEET NOTE IDENTIFICATION
T	TEMPERATURE SENSOR
	POINT OF CONNECTION, NEW TO EXISTING
—X—X—	EXISTING TO BE REMOVED
—RL—	REFRIGERANT LIQUID PIPING
—RS—	REFRIGERANT SUCTION PIPING
	STEAM TRAP
—HWS—	HEATING HOT WATER SUPPLY PIPING
—HWR—	HEATING HOT WATER RETURN PIPING
	CEILING ACCESS DOOR (IN HARD LID CEILING)

ABBREV.	DESCRIPTION
ø	DIAMETER, PHASE
ABC	ABOVE CEILING
ABV	ABOVE
AC	AIR CONDITIONING
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARCH	ARCHITECT OR ARCHITECTURAL
BDD	COUNTER-BALANCED BACKDRAFT DAMPER
BF	BELOW FLOOR
BHP	BRAKE HORSEPOWER
BTUH	BRITISH THERMAL UNITS PER HOUR
CC	COOLING COIL
CFF	CAP FOR FUTURE
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CONN	CONNECT, CONNECTION
CONT	CONTINUATION
D	DOWN, DROP
DB	DRY BULB TEMPERATURE
DIA	DIAMETER
DL	DOOR LOUVER
DTR	DUCT THRU ROOF
E	EXISTING
EA	EACH, EXHAUST AIR
EAD	EXHAUST AIR DAMPER
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB
EF	EXHAUST FAN
EFF	EFFICIENCY
ELEC	ELECTRICAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
FA	FROM ABOVE
FB	FROM BELOW
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FH	FUME HOOD
FLR	FLOOR
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
FT	FEET
GA	GAUGE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GSM	GALVANIZED SHEET METAL
HC	HEATING COIL
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTG	HEATING
IN. WC.	INCHES WATER COLUMN
LAT	LEAVING AIR TEMPERATURE
LDB	LEAVING DRY BULB TEMPERATURE
LRA	LOCKED ROTOR AMPS
LWB	LEAVING WET BULB TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAD	MANUAL AIR DAMPER
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
N	NEW
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
OC	ON CENTER
OH	OVERHEAD
PD	PRESSURE DROP
PH	PHASE
POC	POINT OF CONNECTION, NEW TO EXISTING
PSI(G)	POUNDS PER SQUARE INCH (GAUGE)
QTY	QUANTITY
R	RISE
RA	RETURN AIR
RAD	RETURN AIR DAMPER
RB	RE-BALANCE
RL	REFRIGERANT LIQUID PIPING
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION PIPING

ABBREV.	DESCRIPTION CONTINUED
SA	SUPPLY AIR
SIM	SIMILAR
SP	STATIC PRESSURE
SS	STAINLESS STEEL
STD	STANDARD
STRUC	STRUCTURAL
TA	TO ABOVE
TB	TO BELOW
TCP	TEMPERATURE CONTROL PANEL
TEMP	TEMPERATURE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS
WB	WET BULB
WT	WEIGHT

HVAC GENERAL NOTES continued

25. AIR MOVING SYSTEMS SUPPLYING AIR IN EXCESS OF 2000 CUBIC FEET PER MINUTE SHALL BE EQUIPPED WITH AUTOMATIC SHUT-OFF. AUTOMATIC SHUT-OFF SHALL BE ACCOMPLISHED BY INTERRUPTING THE POWER SOURCE OF THE AIR MOVING EQUIPMENT UPON DETECTION OF SMOKE IN THE MAIN SUPPLY AIR DUCT OR PLENUM SERVED BY SUCH EQUIPMENT.

HVAC GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH 2019 CMC, ALL OTHER APPLICABLE CODES, SPECIFICATIONS, LOCAL ORDINANACES AND INDUSTRY STANDARDS.
2. FIELD VERIFY LOCATIONS OF ALL DUCTWORK, PIPING, EQUIPMENT, ROOF FRAMING, ATTIC FRAMING, ETC. PRIOR TO START OF WORK. ADJUST NEW WORK AS NECESSARY TO COMPENSATE FOR VARIATIONS IN LOCATIONS OF OTHER WORK THAN HVAC WORK.
3. FIELD VERIFY ACTUAL REFLECTED CEILING LAYOUT AND LIGHTING LAYOUT FOR EXACT LOCATION OF ALL CEILING DIFFUSERS, REGISTERS AND GRILLES.
4. MECHANICAL CONTRACTOR SHALL MAINTAIN RECORDED "AS-BUILT" INFORMATION ON ALL WORK INSTALLED DURING CONSTRUCTION AND IT SHALL BE CLEARLY MARKED IN COLORED PENCIL ON A REPRODUCIBLE PRINT OF SHOP DRAWINGS. RECORDED INFORMATION SHALL INCLUDE ROUTING AND ELEVATIONS. THE CONTRACTOR SHALL TURN RECORDED "AS-BUILT" INFORMATION OVER TO THE OWNER AND/OR RESPONSIBLE DESIGN PROFESSIONAL AT THE COMPLETION OF CONSTRUCTION.
5. THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IS TO PROVIDE NEW HVAC AIR CONDITIONING SYSTEMS FOR A NEW LABORATORY SPACE WITH CONDITIONED BUILDING AREA IN ACCORDANCE WITH LOCAL BUILDING DEPARTMENT REQUIREMENTS AND THE 2019 CALIFORNIA BUILDING STANDARDS CODE AND CALIFORNIA CODE OF REGULATIONS. SHOULD ANY CONDITIONS DEVELOP THAT ARE NOT COVERED BY THE APPROVED DRAWINGS AND SPECIFICATIONS A CHANGE ORDER DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO THE ARCHITECT AND ENGINEER AND APPROVED BEFORE PROCEEDING WITH THE WORK.
6. PROVIDE MINIMUM THREE PAPER COPIES OF BALANCE REPORTS FOR REVIEW BY THE MECHANICAL ENGINEER. ELECTRONIC SUBMITTALS WILL NOT BE REVIEWED, PROVIDE ONLY BOUND PAPER REPORTS FOR REVIEW. SEE PLANS FOR BALANCE REQUIREMENTS.
7. PROVIDE LOW VOLTAGE WIRING FOR NEW PROGRAMMABLE THERMOSTATS RATED FOR USE IN NEW LAB ROOM SPACES AND NEW CEILING SPACES.
8. COORDINATE EXACT SIZE AND ROUTING OF DUCTWORK AND PIPING ON THE JOB PRIOR TO FABRICATION AND INSTALLATION WITH ARCHITECTURAL, STRUCTURAL, PLUMBING AND ELECTRICAL. NOT ALL DUCT RISES AND DROPS ARE SHOWN. PROVIDE ADDITIONAL DUCT RISES AND DUCT DROPS AS REQUIRED TO ACCOMMODATE STRUCTURE AND NEW BUILDING CONDITIONS. PROVIDE INSTALLATION FOR A COMPLETE SYSTEM FOR CONNECTION FROM THE NEW AC UNITS TO THE (N) DUCTWORK COORDINATED WITH OTHER SYSTEMS ASSCOCIATED WITH NEW BUILDING.
9. FIELD COORDINATE HVAC EQUIPMENT AND DUCTWORK WITH OWNER PROVIDED AND INSTALLED LAB EQUIPMENT IN THE BELL PROVER LAB AND THE METROLOGY LAB. FIELD COORDINATE HVAC IN MAINTENANCE SHOP AND VEHICLE BAY WITN COUNTY VEHICLES (COORD WITH OWNER) THAT ENTER INTO THE ROOMS.
10. PROVIDE MANUAL AIR DAMPERS AT ALL DUCT BRANCH TAKEOFFS TO A SINGLE SUPPLY DIFFUSER/REGISTER/GRILLE. SET DAMPERS TO FULLY OPEN POSITION BEFORE TESTING, ADJUSTING, AND BALANCING. LOCATE MAD's AS CLOSE AS POSSIBLE TO THE BRANCH DUCT TAKE-OFF. HOLD MAD's AS FAR AS POSSIBLE AWAY FROM THE DIFFUSER, REGISTER OR GRILLE TO MITIGATE DAMPER NOISE.
11. ALL WORK SHOWN IS NEW UNLESS NOTED OTHERWISE. CAREFULLY COORDINATE CONNECTION OF NEW WORK TO EXISTING WORK.
12. FIELD VERIFY ACCESS PANELS AS NECESSARY TO PROPERLY ACCESS THE (N) MECHANICAL SYSTEMS INCLUDING VALVES, EQUIPMENT, CONTROLS AND DAMPERS. COORDINATE WITH EXISTING CONDITIONS.
13. INSTALL AND SUPPORT DUCTWORK PER 2019 CMC CODE SECTIONS 603.1, 603.2, 603.3, 603.4, 603.5, 603.8, 603.10 AND 603.11 AND AS SET FORTH IN "ANSI/SMACNA 006-2006 HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, 3RD EDITION". DUCTWORK SHALL BE BRACED TO PREVENT LATERAL & HORIZONTAL SWING. ALL INSTALLATIONS SHALL MEET ASCE 7-10 WITH ALL MODIFICATIONS INCORPORATED IN 2019 CBC FOR APPLICABLE OCCUPANCY TYPES.
14. PROVIDE GALVANIZED SHEET METAL FOR SUPPLY AIR, RETURN AIR, AND OUTSIDE AIR DUCTS AND PLENUMS THAT COMPLY WITH 2019 CMC CODE SECTIONS 602.1, 602.2, 602.3, 602.4, 602.5, 602.6 AND 603.0. PER THE 2016 CMC CODE SECTIONS REFERENCED PROVIDE DUCT SYSTEMS CONSTRUCTED OF GALVANIZED SHEET METAL (UNLESS OTHERWISE SPECIFIED) AS SET FORTH IN "ANSI/SMACNA 006-2006 HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, 3RD EDITION". PROVIDE TURNING VANES IN RECTANGULAR ELBOWS UNLESS OTHERWISE NOTED.
15. PROVIDE GALVANIZED SHEET METAL FOR EXHAUST AIR DUCTS AND PLENUMS THAT COMPLY WITH 2019 CMC CODE SECTIONS 504.1, 602.1, 602.3, 602.6 AND 603.0. PER THE 2019 CMC CODE SECTIONS REFERENCED PROVIDE DUCT SYSTEMS CONSTRUCTED OF GALVANIZED SHEET METAL AS SET FORTH IN "ANSI/SMACNA 006-2006 HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, 3RD EDITION".
16. PROVIDE 2" THICK EXTERIOR RIGID BOARD OR WRAP INSULATION WITH WATER PROOF INNER JACKET AND ALUMINUM OUTER JACKET WITH STUCCO DESIGN ON SUPPLY DUCT AND RETURN DUCT EXPOSED OUTDOORS WITH A MINIMUM INSTALLED INSULATION VALUE OF R-8.0 AT 25% COMPRESSED THICKNESS. TOP OF JACKET ON HORIZONTAL OUTDOOR DUCTS SHALL SLOPE TO COMPLETELY DRAIN OFF WATER WITH NO POOLING OF WATER. NO DUCT LINER ALLOWED IN DUCTWORK DUE TO CRITICAL WORK IN LAB SPACES.
17. SECURE EXTERIOR INSULATION TO GSM DUCTWORK USING ALUMINUM BANDS, 3/4" WIDE WITH WING SEAL OR CLOSED SEAL. FOR RECTANGULAR DUCT, ADHESIVELY ATTACHED METAL INSULATION PINS WITH SELF-LOCKING WASHERS MAY BE USED.
18. FLEXIBLE DUCT IF SHOWN ON PLANS SHALL BE NO MORE THAN 5'-0" TO ANY SINGLE DIFFUSER OR GRILLE AND SHALL HAVE ONLY LONG RADIUS BENDS. FLEXIBLE SUPPLY DUCT SHALL HAVE MINIMUM INSULATION THICKNESS TO MEET TITLE 24 INSULATION REQUIREMENTS (K=0.23 AT 75°F) WITH MINIMUM INSULATION VALUE TO MEET NOTE BELOW. FLEX DUCT SHALL NOT BE USED IN LIEU OF RIGID ELBOWS OR FITTINGS. NO FLEX DUCTWORK ALLOWED ON EXHAUST DUCTWORK.
19. DUCTWORK INSULATION SHALL MEET CALIFORNIA TITLE 24 ENERGY STANDARDS. FOR SUPPLY AND RETURN DUCTWORK IN UNCONDTIONED SPACES PROVIDE R8.0 INSULATION VALUE MINIMUM. FOR SUPPLY DUCTWORK LOCATED IN INDIRECTLY CONDITIONED SPACES (INDIRECTLY CONDITIONED SPACE IN THIS PROJECT BEING CEILING SPACES WITHIN NEW BLDG AREA INSULATION ENVELOPE WITH NO VENTS TO THE OUTDOORS) PROVIDE R4.2 INSULATION VALUE MINIMUM. DUCT LINER NOT ALLOWED.
20. SEAL DUCT JOINTS AND DUCT PENETRATIONS PER SMACNA "HVAC AIR DUCT LEAKAGE TEST MANUAL, 2ND EDITION". DUCT SEALANT SHALL BE NON-HARDENING, NON-MIGRATING MASTIC OR LIQUID ELASTIC SEALANT AS COMPOUNDED AND RECOMMENDED BY MANUFACTURER SPECIFICALLY FOR SEALING JOINTS AND SEAMS IN DUCTWORK.
21. PROVIDE TURNING VANES AT ALL RECTANGULAR DUCT ELBOWS PROPERLY INSTALLED TO PREVENT RATTLING. PROVIDE SPLITTER TEE WITH TURNING VANES AT RECTANGULAR DUCT TEES AT DUCTWORK AND AT DUCT FITTINGS WHERE AIR CHANGES DIRECTION.
22. FIRE STOPPING SHALL BE PROVIDED AS REQUIRED BY 2019 CBC SECTION 714. FIRE STOPPING SHALL BE UL LISTED AND SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS. MANUFACTURER'S DIRECTIONS SHALL BE MADE AVAILABLE TO THE INSPECTING AUTHORITY. PROVIDE SUBMITTALS.
23. INTERIOR EXPOSED ROUND DUCTWORK SHALL BE GSM "UNITED MCGILL" UNI-SEAL OR EQUAL ROUND SPIRAL LOCKSEAM RATED FOR 2" TO 10" wg STANDARD WITH HEAVY GAUGE SOLID WELDED FITTINGS OR EQUAL. ALL EXPOSED DUCTWORK SHALL BE CONSTRUCTED WITH FLAT SEAMS. TAPPED BRANCH FITTINGS NOT ALLOWED ON EXPOSED DUCTWORK. PROVIDE FACTORY FITTINGS BY "UNITED MCGILL" OR EQUAL. PROVIDE MINIMUM 24 GAUGE FOR DUCT AND PROVIDE MINIMUM 22 GAUGE FOR FACTORY FITTINGS. SEE ARCH FOR PAINTING OF DUCTWORK.
24. LOCATIONS OF TEMPERATURE SENSING DEVICES SUCH AS THERMOSTATS SHALL BE FIELD COORDINATED WITH HEAT PRODUCING EQUIPMENT PROVIDED IN THIS PROJECT AND POSSIBLE FUTURE IMPROVEMENTS AND FIELD COORDINATED WITH THE OWNER PRIOR TO INSTALLATION TO PROVIDE PROPER TEMPERATURE SENSING FOR THE HVAC COOLING AND HEATING EQUIPMENT.

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JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

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DATE	12/11/2023
DRAWN	NEB
JOB NO.	22039
SHEET	M0.1
	HVAC LEGENDS AND NOTES
OF	SHEETS

ROOFTOP PACKAGED HEAT PUMP SCHEDULE

TAG	AREA SERVED UNIT LOCATION	TYPE	BASIS OF DESIGN (OR EQUAL) MFG.	MODEL	FLOW (CFM)	ESP (IN)	MIN OA FLOW (CFM)	RFDG TYPE	COOLING MIN (MBH) SENS	TOTAL	EVAP. EDB(°F)	EWB(°F)	SEER (EER)	HEATING DX HEAT (MBH)	HSPF	AUX ELEC HEAT (kW)	ELECTRICAL SUPPLY FAN HP	FLA	COMPRESSOR QTY	LRA	RLA	COND. FAN QTY	FLA	MCA	MOCP	V/PH/HZ	WEIGHT (LBS)	NOTES
AC 1	PESTICIDE ID LAB GROUND - WEST	SIDE DISCHARGE	TRANE	3-TONS WSC036H3RBA	960	0.8	250	R410a	30.3	33.7	85.5	66	14.3 (12.1)	27	8.0	6kW @ 240V 20.5 MBH	3/4	5.7	1	-	15.0	1	1.1	42	50	208/3/60	750	1 3 4 6
AC 2	TRAPPING SUPPLY GROUND - WEST	SIDE DISCHARGE	TRANE	4-TONS WSC048H3RBA	1,600	1.0	100 800	R410a	42.3	45.6	90	67	14.3 (12.1)	36	8.2	6kW @ 240V 20.5 MBH	1-1/2	8.2	1	-	14.5	1	1.4	44	50	208/3/60	800	1 2 3 4 5
AC 3	BELL PROVER LAB GROUND - WEST	SIDE DISCHARGE	TRANE	2-TONS 4WCC4024E1	800	0.8	100	R410a	23.8	23.8	80	67	13.4 SEER2 (11 EER2)	23	7 HSPF2	5kW @ 240V 12.8 MBH	1/3	2.8	1	58.3	12.8	1	0.5	23	30	208/1/60	400	1 3 4 6
AC 4	METROLOGY LAB GROUND - WEST	SIDE DISCHARGE	TRANE	3-TONS WSC036H3RBA	960	0.8	150	R410a	28.2	33.0	82.5	65	14.3 (12.1)	27	8.0	6kW @ 240V 20.5 MBH	3/4	5.7	1	-	15.0	1	1.1	42	50	208/3/60	750	1 3 4 6
AC 5	MAINTENANCE SHOP GROUND - WEST	SIDE DISCHARGE	TRANE	3-TONS WSC036H3RBA	960	0.8	150	R410a	28.2	33.0	82.5	65	14.3 (12.1)	27	8.0	6kW @ 240V 20.5 MBH	3/4	5.7	1	-	15.0	1	1.1	42	50	208/3/60	750	1 3 4 6

NOTES:

1. MEASURE AND RECORD ALL AIR OUTLETS ON THE AIR SYSTEM WITH ALL RETURN AND EXHAUST FANS OPERATING AND SUBMIT AIR BALANCE REPORTS FOR REVIEW AS FOLLOWS: BALANCE AND RECORD DURING FINAL BALANCE AIR OUTLETS AND INLETS TO PLUS OR MINUS 5% OF THE SCHEDULED VALUES SHOWN ON PLAN AND SCHEDULES AND SUBMIT FINAL TESTING, ADJUSTING & BALANCE (TAB) REPORT TO THE ARCHITECT & ENGINEER FOR REVIEW.
2. WHEN FUME HOOD IS ON PROVIDE 800 CFM RA TO UNIT AND COIL AND 800 CFM OUTSIDE AIR. WHEN FUME HOOD IS OFF PROVIDE 1500 CFM RA TO UNIT AND COIL AND 100 CFM OUTSIDE AIR. PROVIDE FIELD INSTALLED MODULATING CONTROL DAMPERS AS REQUIRED AT THE RETURN AIR AND OUTSIDE AIR DUCTS, ENABLED BY FUME HOOD SWITCH. PROVIDE ALL NECESSARY CONTROLS FOR A COMPLETE FUNCTIONING SYSTEM.
3. PROVIDE 2" THICK MERV 13, 30% FILTERS AT AC UNIT, FIELD COORDINATE SIZE OF REQUIRED FILTERS WITH AC UNIT MANUFACTURER.
4. MOUNT (N) AC UNIT ON (N) MANUFACTURE'S CURB ATTACHED TO CONCRETE PAD, PROVIDE FOR HORIZONTAL DISCHARGE, SEE DETAIL 1/M5.1 AND PLAN M2.1. SEE ARCH/STRUC FOR PAD WORK.
5. NO TRAPPING SUPPLY CHEMICALS WILL BE STORED IN THE FUME HOOD. TRAPPING SUPPLY CHEMICALS WILL BE STORED IN THE VENTILATED STORAGE CABINET.
6. PROVIDE MANUAL OUTSIDE AIR DAMPER WITH HOOD AND BACKDRAFT DAMPER. INSTALL IN EXTERIOR RA DUCT. BALANCE OSA TO VALUE INDICATED.

GENERAL NOTES:

1. COORDINATE WITH THE OWNER FOR OCCUPIED AND UNOCCUPIED OPERATION SCHEDULE FOR PROGRAMMING OF (N) THERMOSTAT. PROVIDE MIN 1 HOUR OF TRAINING FOR OPERATION AND PROGRAMMING OF (N) PROGRAMABLE THERMOSTAT FOR THE OWNER'S MAINTENANCE STAFF. SEE CONTROLS SEQUENCE.
2. PROVIDE DRIVE SETTINGS FOR SUPPLY FAN WITH FACTORY BELT DRIVE FAN TO INSTALLER FOR PERFORMANCE SHOWN.
3. PROVIDE FACTORY START-UP AND FIRST YEAR PARTS AND LABOR WARRANTY BY ORIGINAL EQUIPMENT MANUFACTURER.
4. FOR EACH AC UNIT PROVIDE 7-DAY PROGRAMMABLE COOLING/HEATING THERMOSTAT WITH TEMPERATURE SETBACK CAPABILITY AND TIME CLOCK FUNCTIONS TO SET CONDITIONING SETPOINTS FOR AT LEAST FOUR PERIODS OVER 24 HOURS THAT MEETS 2019 CALIFORNIA TITLE 24 ENERGY STANDARDS REQUIREMENTS.
5. UNIT WEIGHT SHOWN IN SCHEDULE INCLUDES AC UNIT AND MANUFACTURER'S 14" HIGH ROOF CURB AND UNIT OPTIONS LISTED, SEE MOUNTING DETAIL 1/M5.1.
6. FOR EACH AC UNIT PROVIDE FACTORY INSTALLED BELT DRIVE SUPPLY FAN, HINGED DOORS, MOTORIZED OUTSIDE AIR DAMPER, MOUNTING CURB 14" HIGH, COIL GUARDS.

EXHAUST FAN SCHEDULE

SYMBOL	LOCATION	"MANUFACTURER" MODEL NUMBER	CFM	ESP "H2O	WATTS	MOTOR HP	FAN RPM	NOISE SONES	VOLTAGE	WEIGHT	NOTES
REF 1	TOILET ROOM	"GREENHECK" CUE 080	250	0.45	-	1/20	1550	7.5	120V/1ø/60Hz	50	1 2 4 5
REF 2	TRAPPING SUPPLY	"GREENHECK" CUE 085	100	0.625	-	1/20	1550	8.1	120V/1ø/60Hz	50	4 5 8 NO CBBD ALLOWED FOR HAZ CABINET
REF 3	MAINT SHOP	"GREENHECK" CUBE 200-7	3500	0.2	-	3/4	707	9.7	208V/3ø/60Hz	150	1 5 6
REF 4	PARKING BAYS	"GREENHECK" CUBE 200-7	3500	0.2	-	3/4	707	9.7	208V/3ø/60Hz	150	1 5 6
FH 6-1	TRAPPING SUPPLY	"LABCONCO" INTEGRAL FAN	700	(E)	(E)	(E)	(E)	(E)	FIELD COORD	(E)	1 5 7

SCHEDULE NOTES:

1. PROVIDE FACTORY COUNTER BALANCED BACKDRAFT DAMPER (CBBD) AT EXHAUST FAN OR AT EXHAUST DUCT TO PREVENT LOSS OF CONDITIONED AIR TO MEET TITLE 24 ENERGY STANDARDS. AN "OR EQUAL" PRODUCT MAY BE PROVIDED, PROVIDE EQUIP SUBMITTAL FOR REVIEW.
2. INTERLOCK EXHAUST FAN OPERATION TO AC UNIT SERVING SAME SPACE AND PROVIDE TIME CLOCK AND PROVIDE LIGHT SWITCH ACTIVATION FROM SAME SPACE, PROVIDE RELAY AS NECESSARY. COORD WITH OWNER FOR FAN OPERATION.
3. NOT USED
4. PROVIDE FACTORY SPEED CONTROL FOR FAN BALANCING.
5. SEE DETAIL 6/M5.1 FOR MOUNTING OF ROOFTOP FANS.
6. INTERMITTENT EXHAUST FAN OPERATION VIA MANUAL SWITCH LOCATED IN ROOM AT DISCRETION OF SPACE USER, SEE CONTROLS SEQUENCES.
7. FUME HOOD BY OWNER WITH OWNER STAND FOR TRAPPING PREPARATION. SEE FUME HOOD SCHEDULE ON M0.3
8. CONTINUOUS EXHAUST FAN OPERATION FOR CHEMICALS STORED IN VENTILATED STORAGE CABINET, DO NOT TURN OFF EXHAUST FAN.

SPLIT SYSTEM AIR CONDITIONING INDOOR UNIT SCHEDULE

SYMBOL	LOCATION	MANUFACTURER MODEL NUMBER	SUPPLY CFM	SUPPLY ESP "H2O	SOUND PRESS dB(A)	RETURN CFM	MIN OSA CFM	CO2 MIN OSA CFM	COOLING EDB °F	EWB °F	LDB °F	SENS. CAP. (MBH)	TOTAL CAP. (MBH)	HEATING EDB °F	LDB °F	SENS. CAP. (MBH)	ELECTRICAL VOLT/PH	UNIT KW	COOL AMPS	UNIT MCA	UNIT MOCP	REFRIGERANT INDOOR MAX CAP	MAX PIPE LENGTH	LIQUID CONN	GAS CONN	SEER STD AHRI ARI	UNIT OVERALL DIMENSIONS DEPTH INCHES	WIDTH INCHES	HEIGHT INCHES	SA CONN INCHES	RA CONN INCHES	UNIT OPER. WT. LBS	NOTES
SAC 1	IT ROOM TRAPPING SUPPLY	"YORK" DHP12NWB21S	400	0	39	400	0	NA	78	62	57.2	10.2	11.5	70	97	12.0	208/1/60	-	6.0	12	20	30.8 OZ	66 FT	1/4"	3/8"	16 8.2	7-7/8	33	11	NA	NA	28	1 2 3 4 5 6

NOTES:

1. PROVIDE WITH REFRIGERANT R-410A WITH INDOOR UNIT MATCHED TO OUTDOOR UNIT.
2. PROVIDE COOLING AND HEAT PUMP HEATING REFRIGERANT CYCLES. PROVIDE WITH LOW AMBIENT CONTROL OPTION.
3. PROVIDE JCI WALL MOUNTED WIRED REMOTE CENTRALIZED CONTROLLER WITH TEMPERATURE SENSOR.
4. PROVIDE FACTORY TYPE L REFRIGERANT TUBING LINE-SET WITH INSULATION IF AVAILABLE, SEE SCHEDULE FOR SIZES.
5. SCHEDULE CAPACITIES BASED ON 105°F OUTDOOR TEMPERATURE FOR COOLING, 30°F OUTDOOR FOR HEATING.
6. MEASURE EQUIPMENT AND SUBMIT AIR BALANCE & SOUND REPORTS FOR REVIEW TO VERIFY MANUFACTURER'S LISTED AIR QUANTITIES & SOUND SHOWN ON THE PLANS.

GENERAL NOTES:

1. MOUNT INDOOR UNIT ON WALL PER MANUFACTURERS WRITTEN INSTALLATION INSTRUCTIONS, SEE DETAIL 7/M5.1.
2. FAN OPERATES AT 43 dBA AT HIGH CFM, ADJUST CFM SETTING TO RESULT IN LESS THAN 40 dB(A) AT EACH INDOOR UNIT.
3. PROVIDE "ASPEN" MINI AQUA UNIVOLT MODEL 83819-DPWM CONDENSATE PUMP FOR MINIMUM CONDENSATE RISE OF 48" TO ROUTE TO LANDSCAPE AT GRADE, MOUNT PUMP IN INDOOR UNIT CONDENSATE PER MANUFACTURER'S DIRECTIONS.
4. PROVIDE "JOHNSON CONTROLS" MODEL DMUNI DFS WIRED TEMPERATURE CENTRALIZED CONTROLLER FOR INDOOR UNIT, SEE PLANS FOR LOCATIONS. INDOOR UNIT OPERATES IN COOLING OR HEATING, NO SIMULTANEOUS COOLING/HEATING.

SPLIT SYSTEM AIR CONDITIONING OUTDOOR UNIT SCHEDULE

SYMBOL	LOCATION	MANUFACTURER MODEL NUMBER	INDIVIDUAL MODULE MODEL NUMBERS	BC CONTROLLER MODEL NUMBER	COOLING ODB °F	OWB °F	KW	SENS. CAP. (MBH)	TOTAL CAP. (MBH)	HEATING OUT °F	KW	TOT. CAP. (MBH)	ELECTRICAL VOLT/PH/Hz	COOLING AMPS	HEATING AMPS	UNIT MCA	UNIT MOCP	REFRIGERANT TO BC CONT LIQUID	TO BC CONT GAS	MODULES TO TWINNING KIT LIQUID	MODULES TO TWINNING KIT GAS	MAX LINE LENGTH	SEER STD AHRI HSPF	UNIT OVERALL DIMENSIONS DEPTH INCHES	WIDTH INCHES	HEIGHT INCHES	COMP. DIM. INCHES	COMP. DIM. INCHES	TOTAL OPER. WT. LBS	NOTES
CU 1	OUTDOOR AT 2ND FLR EAST ROOF	"YORK" DHP-12CSB21S	NA	NA	105	70	-	10.2	11.5	30	-	11.4	208/1/60	-	-	14	20	1/4"	3/8"	NA	NA	66 FT	16 8.2	12.59	30.55	21.25	NA	NA	105	1 2 3

NOTES:

1. PROVIDE WITH REFRIGERANT R-410A WITH 1 OR 2 INDOOR UNITS MATCHED TO ONE OUTDOOR UNIT PER PLANS AND SCHEDULE
2. PROVIDE WITH LOW AMBIENT CONTROL OPTION AND WIND BAFFLE FOR OPERATION DOWN TO 5°F OUTDOOR TEMPERATURE.
3. PROVIDE FACTORY TYPE L REFRIGRANT LINE-SET IF AVAILABLE. RECOMMENDED WIRE CONNECTION BETWEEN OUTDOOR/INDOOR UNITS 14-4 AWG THHN 600 V WIRE.

GENERAL NOTES:

1. MOUNT CONDENSING UNIT LEVEL ON EQUIPMENT SUPPORT ON ROOF, SEE DETAIL 1/M5.2.
2. ROOF CONDENSING FAN OPERATES AT 56 dBA.

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	DATE:	DESCRIPTION:
3	7/29/2024	ALL ELECTRIC

DATE 12/11/2023
DRAWN NEB
JOB NO. 22039
SHEET M0.2
HVAC SCHEDULES
OF SHEETS

DIFFUSER & GRILLE SCHEDULE

SYMBOL	TITUS (OR EQUAL)	DESCRIPTION	NOTES
CD-1	MCD BORDER TYPE 1	CEILING SUPPLY DIFFUSER WITH MODULAR CORE LOUVERED FACE SURFACE OR DUCT MOUNT	FIELD ADJUSTABLE THROW PATTERN, STEEL, PROVIDE GSM DIFFUSER PLENUM
CDL	MCD BORDER TYPE 3	CEILING SUPPLY DIFFUSER WITH MODULAR CORE LOUVERED FACE, LAY-IN MOUNT, 24x24 FACE	FIELD ADJUSTABLE (SEE PLANS) THROW PATTERN, STEEL, PROVIDE GSM DIFFUSER PLENUM
SG-1	272 RL BORDER TYPE 1	SUPPLY REGISTER FOR SIDE WALL OR DUCT MOUNT WITH LOUVERED FACE, ADJUSTABLE DOUBLE DEFLECT	PROVIDE MULTI BLADE MAD AT NECK, WHITE COLOR, PAINT FRONT AND BACK OF GRILLE
CR-1	50F BORDER TYPE 1	CEILING RETURN WITH 1/2x1/2x1 EGGCRATE FACE SURFACE MOUNT	PROVIDE GSM PLENUM ON GRILLE
CRL	50F BORDER TYPE 3	CEILING RETURN WITH 1/2x1/2x1 EGGCRATE FACE LAY-IN MOUNT, 24x24 FACE, 22x22 DUCT CONN SIZE	PROVIDE GSM PLENUM ON GRILLE
CE-1	50F BORDER TYPE 1	EXHAUST GRILLE WITH 1/2x1/2x1 EGGCRATE FACE SURFACE MOUNT	PROVIDE GSM DUCT DIRECTLY TO EXHAUST FAN FROM GRILLE CONNECTION
CEL	50F BORDER TYPE 3	EXHAUST GRILLE WITH 1/2x1/2x1 EGGCRATE FACE LAY-IN MOUNT, 24x24 FACE, 22x22 DUCT CONN SIZE	PROVIDE GSM PLENUM ON GRILLE
SG-1	300 RL BORDER TYPE 1 OR AT EXPOSED SA DUCT	SUPPLY GRILLE FOR SURFACE WALL MOUNT WITH LOUVERED FACE, WITH 35° FIXED DEFLECTION	PROVIDE MULTI BLADE MAD AT SA DUCT, PROVIDE GOOD INSTALL APPEARANCE, WHITE COLOR, PAINT FRONT AND BACK OF GRILLE
RG-1/EG-1	350 RL BORDER TYPE 1	RETURN GRILLE FOR SURFACE WALL MOUNT WITH LOUVERED FACE, WITH 35° FIXED DEFLECTION	PROVIDE MULTI BLADE MAD AT RA DUCT PROVIDE GOOD INSTALL APPEARANCE, WHITE COLOR, PAINT FRONT AND BACK OF GRILLE

GENERAL NOTES:

1. NEW DIFFUSER AND GRILLE FINISH SHALL BE WHITE.
2. REFER TO FLOOR PLANS FOR SIZE & QUANTITY & BLOW OF DIFFUSER/GRILLES.
3. SUPPLY AIR DIFFUSERS SHALL BE 4-WAY BLOW UNLESS SHOWN OTHERWISE.
4. DO NOT PROVIDE OPPOSED BLADE DAMPERS AT NECKS OF DIFFUSERS, REGISTERS OR GRILLES UNLESS NOTED ON PLANS OR SCHEDULES.
5. PROVIDE MANUAL AIR DAMPERS AT EACH BRANCH DUCT TO ANY SINGLE DIFFUSER, REGISTER & GRILLE, DO NOT PROVIDE AT NECK UNLESS OTHERWISE NOTED ON PLANS.
6. ALL DUCTWORK SHALL BE GSM WITH MAX FIVE FEET OF FLEX DUCT AT DIFF/REG/GRILLE. NO FLEX DUCT ALLOWED ON EXPOSED DUCT. PROVIDE GSM PLENUM BOXES ON TOP OF DIFFUSERS AND GRILLS, SEE DETAIL 3/M5.1 FOR DIFF/REG MOUNTING.
7. USE SURFACE MOUNT GRILLES AT EXPOSED AREAS WITH NO CEILING.

SEQUENCE OF OPERATIONS

AIR CONDITIONING UNIT OPERATION SEQUENCE

THE (N) AC UNITS (PACKAGE AC UNITS) SHALL BE OPERATED ON A TIMED SCHEDULE PER THE AUTOMATIC TIMECLOCK FUNCTIONS OF A 7-DAY PROGRAMMABLE THERMOSTAT. PROVIDE TEMPERATURE SETBACK CAPABILITY FOR AC UNIT OPERATION DURING NON-TYPICAL HOURS. THE AC UNIT SHALL BE CAPABLE OF BEING INITIATED THRU A MANUAL BYPASS SWITCH FOR UP TO FOUR HOURS. CONTROL SHALL AT LEAST MAINTAIN ROOM TEMPERATURE SET-POINT AND MINIMUM OUTSIDE VENTILATION AIR AT ALL TIMES WHEN BUILDING IS OCCUPIED. SEE PLANS FOR TEMPERATURE SENSOR LOCATION. ONE HOUR (ADJUSTABLE) BEFORE OCCUPIED TIME PROVIDE MORNING WARM-UP OR MORNING COOL-DOWN SCHEDULES DEPENDING ON HEATING OR COOLING SEASON. FIELD COORDINATE WITH THE OWNER AND PROVIDE OPERATION TIMES FOR THE AC UNITS. PROVIDE TRAINING FOR (N) THERMOSTAT OPERATION AND PROGRAMMING. AUTO CONTROLS FOR AC UNITS SHALL BE FACTORY PROVIDED INTEGRAL WITH AC UNIT WITH FACTORY CONTROL PANEL.

FOR AC UNIT AC-2 AND AC-5 WITH SPECIAL CONTROL VENTILATION AUTO CONTROLS SHALL ALTAR NORMAL UNIT OPERATION AS FOLLOWS: AC-2 RA CONTROL DAMPER WILL BE SET TO 1700 CFM RA WHEN FUME HOOD IS OFF AND SET TO 1000 CFM RA WHEN FUME HOOD IS ON. FIELD INSTALL OSA CONTROL DAMPER FOR VARYING OSA TO AC-2 INTERLOCKED TO RA DAMPER. WHEN EXHAUST FAN REF-3 IS ACTIVATED FOR WELDING THE AC UNIT AC-5 SHALL BE DEACTIVATED AND DOORS SHALL BE OPEN FOR UNCONDITIONED MAKE-UP AIR IN THE SPACE.

VIA AC UNIT PACKAGE CONTROLS PROVIDE A MORNING PRECOOL AND MORNING WARMUP CYCLE VIA TIMECLOCK, FIELD COORDINATE WITH OWNER FOR TIMES.

REF EXHAUST FAN OPERATION SEQUENCE

REF-1 TOILET EXHAUST FAN AT EACH TOILET ROOM SHALL OPERATE CONCURRENTLY WITH THE AC UNITS DURING OCCUPIED HOURS. INTERLOCK EXHAUST FAN OPERATION FOR AC-1 UNIT OPERATION AND OPERATE TOILET EXHAUST IF LIGHT SWITCH IS OPERATED OR OCCUPANCY SENSOR ACTIVATES (SEE ELEC).

REF-2 TRAPPING ROOM EXHAUST FAN FOR VENTILATED STORAGE CABINET SHALL OPERATE AT ALL TIMES.

REF-3 MAINTENANCE SHOP EXHAUST FAN SHALL OPERATE VIA A WALL SWITCH FOR OCCASIONAL WELDING OPERATIONS WITH PORTABLE WELDER IN SHOP. AC-5 SHALL BE DE-ACTIVATED (PROVIDE RELAYS AS NECESSARY) DURING WELDING OPERATIONS WITH REF-3 OPERATING. DURING WELDING THE ROLL UP DOOR SHALL BE OPENED FOR UNCONDITIONED MAKE-UP AIR.

REF-4 VEHICLE PARKING BAYS EXHAUST FAN SHALL OPERATE VIA A WALL SWITCH FOR VEHICLE PARKING OPERATIONS WHEN ANY VEHICLE IS ALLOWED TO RUN FOR ANY TIME PERIOD AND SHALL BE SHUT OFF AFTER RUNNING VEHICLE IS OFF FOR MIN 5 MINUTES. WHILE ANY VEHICLE IS RUNNING AND WHEN THE FAN IS ON THE ROLL UP DOOR SHALL BE OPENED FOR UNCONDITIONED MAKE-UP AIR.

FUME HOOD FH-1 WITH INTEGRAL EXHAUST FAN HEF-1 SHALL OPERATE VIA AN INTEGRAL HOOD SWITCH. SEE OPERATION RESTRICTIONS IN NOTES ON PLANS.

EXISTING FUME HOOD SCHEDULE

TAG	UNIT (LOCATION)	MATERIAL TYPES	"NUAIRE" MODEL	HOOD TYPE	BLOWER SUPPLY CFM	SASH FLOW CFM	EXHAUST CFM	HOOD DIFF STATIC INCHES WG	EXHAUST FAN	SASH OPEN HEIGHT	SASH OPEN WIDTH	SASH OPEN AREA	AVERAGE FACE VELOCITY THRU OPEN SASH	EA LOSS INCHES H2O	EXHAUST DUCT CONN SIZE	SUPPLY FAN INLET SIZE	POWER V/Ph/Hz	TOTAL AMPS	OVERALL DIMENSIONS WIDTH	OVERALL DIMENSIONS DEPTH	OVERALL DIMENSIONS HEIGHT	SEISMIC STAND HEIGHT	WEIGHT LBS	NOTES
FH-6-1	TRAPPING SUPPLY ROOM 104	HAZARDOUS CARCINOGENIC	"LABCONCO" BASIC 70 FUME HOOD 70" WIDE x 27" DEEP x 48" HIGH	(E) FUME	700	700/IN	700	0.8"	INTEGRAL HEF-1	14.5	66"	6.65 SF	105 FPM	UNKNOWN	UNKNOWN	NA	FIELD VERIFY	FIELD VERIFY	70"	27"	48"	32.5"	UNKNOWN	(1)(2)(3)(4)(5)

SCHEDULE NOTES:

(1) HAZARDOUS MATERIALS ARE HANDLED IN THIS FUME HOOD CABINET. THE MINIMUM ALLOWED ACTUAL MEASURED FACE VELOCITY AT ANY ONE POINT AT THE SASH OPENING IS 90 FPM FOR CERTIFICATION.

(2) FIELD VERIFY IF AIR FILTERS ARE EXISTING IN THE FUME HOOD EXHASUT CABINET. IF FILTERS ARE PRESENT REPLACE WITH NEW FILTERS.

(3) THE FUME HOOD WILL BE SUPPLIED BY THE OWNER, "YOLO COUNTY", WHO ELECTED TO RE-USE THE EXISTING FUME HOOD, THE FUME HOOD WILL BE TURNED OVER TO THE CONTRACTOR AT AN AGREED UPON LOCATION BY THE OWNER AND CONTRACTOR IN GOOD USABLE AND CLEANED CONDITION. THE CONTRACTOR SHALL INSTALL THE RELOCATED FUME HOOD CABINET AS SHOWN ON THE CONSTRUCTION DOCUMENTS WITHOUT ANY MODIFICATIONS OR CHANGES TO THE FACTORY INSTALLED COMPONENTS OF THE FUME HOOD CABINET. A NEW STAND WILL BE PROVIDED BY THE OWNER ATTACHED TO THE FUME HOOD FOR MOUNTING OF THE FUME HOOD WITH BASE STAND IN THE LAB.

(4) ANCHOR THE FUME HOOD CABINET STAND WITH SEISMIC ANCHOR CLIPS AT THE STAND LEGS AND ANCHOR THE CABINET TO THE STAND PER MANUFACTURER RECOMMENDATIONS. SEE ARCHITECTURAL AND STRUCTURAL DETAILS.

(5) AIR IS SUPPLIED FROM AC-2 FOR THE TRAPPING SUPPLY ROOM AND SHALL BE CONTROLLED TO OPERATE AT THE CONDITIONS WHEN THE FUME HOOD IS ON AND WHEN IT IS OFF, SEE CONTROL SEQUENCE NOTES AND SCHEDULE NOTES ON M0.2 AND M2.1. NO TRAPPING SUPPLY MATERIAL SHALL EVER BE STORED OR LEFT IN THE FUMR HOOD AT ANY TIME IF THE EXHASUT FAN IS OFF.

GENERAL NOTES:

1. THE SASH HEIGHT SCHEDULED IS THE MAXIMUM ALLOWED FOR THE SCHEDULED CFM TO MAINTAIN THE AVERAGE FACE VELOCITY. FACE VELOCITY THRU SASH OPENING MAY VARY AT A MAXIMUM PLUS 5% BUT NOT BELOW SCHEDULED MINIMUM FLOW RATES OF 100 FEET PER MINUTE, HOWEVER SEE NOTE 2 FOR ANY ONE POINT IN SASH OPENING AREA.
2. THE AVERAGE FUME HOOD CABINET LINEAR VELOCITY ARE BASED ON THE OVERALL AVERAGE FACE VELOCITY THRU THE SASH OPENING OF THE FUME HOOD CABINET. FOR EXAMPLE FOR THE FUME HOOD THE SASH INFLOW OF 700 CFW/6.65 SF CALCULATES TO 105 FPM BUT THE VELOCITY MAY NOT BE UNIFORM OVER THE SASH OPENING FACE AREA. THE MINIMUM ALLOWED ACTUAL MEASURED FACE VELOCITY AT ANY ONE POINT AT ANY LOCATION IN THE FUME HOOD SASH OPENING IS 90 FPM.
3. THE AVERAGE BIOLOGICAL SAFETY CABINET LINEAR VELOCITIES ARE BASED ON THE DIMENSIONS OF THE SCHEDULED OWNER SUPPLIED FUME HOOD CABINET. CAREFULLY COORDINATE SASH HEIGHTS TO MAINTAIN SCHEDULED FACE VELOCITIES THRU OPEN SASH AREAS.
4. THE SASH STOP LOCATION SHALL BE FIXED AND MARKED WITH A SIGNED AND DATED CERTIFICATION LABEL ON THE FUME HOOD CABINET TO PROVIDE THE SASH OPENING PER THIS SCHEDULE. FOR BALANCING THE VELOCITY SCHEDULED IS THE AVERAGE LINEAR VELOCITY OVER THE ENTIRE ACTUAL SASH OPENING AREA.
5. CONNECT EXHAUST DUCT TO FACTORY FUME HOOD TOP OUTLET AT EXHAUST CONNECTION OF THE FUME HOOD CABINET PER MANUFACTURER'S DIRECTIONS AND PROVIDE NEOPRENE SLEEVE AT EXHAUST DUCT CONNECTION (WITH SS BAND CLAMPS) RATED FOR CHEMICALS USED IN HOOD. DO NOT HARD CONNECT EXHAUST DUCT. PROVIDE MANUFACTURER'S 3" RECOMMENDED OVERLAP AT BOTH ENDS OF SLEEVE AND TIGHTEN BAND CLAMPS FOR CONNECTION OF SLEEVE TO GSM DUCT. DO NOT OVERTIGHTEN OR DAMAGE DUCT OR NEOPRENE SLEEVE ASSEMBLY, DO NOT DRILL OR USE MECHANICAL FASTENERS THAT WILL DROP METAL PARTICLES INTO THE CABINET OR FAN OR HOOD OR FILTERS. CONNECTION SHALL BE AIR TIGHT. PROVIDE MANUFACTURER'S RECOMENDED CIRCUIT PROTECTION OF AMPERAGE AS MEASURED IN THE FIELD FOR THE EXISTING HOOD EXHAUST FAN TO OBTAIN THE SPECIFIED 700 CFM EXHAUST (NO MANUFACTURER'S INFORMATION COULD BE FOUND).

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JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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DATE 12/11/2023
DRAWN NEB
JOB NO. 22039
SHEET M0.3
HVAC SCHEDULES
OF SHEETS

PLAN GENERAL NOTES

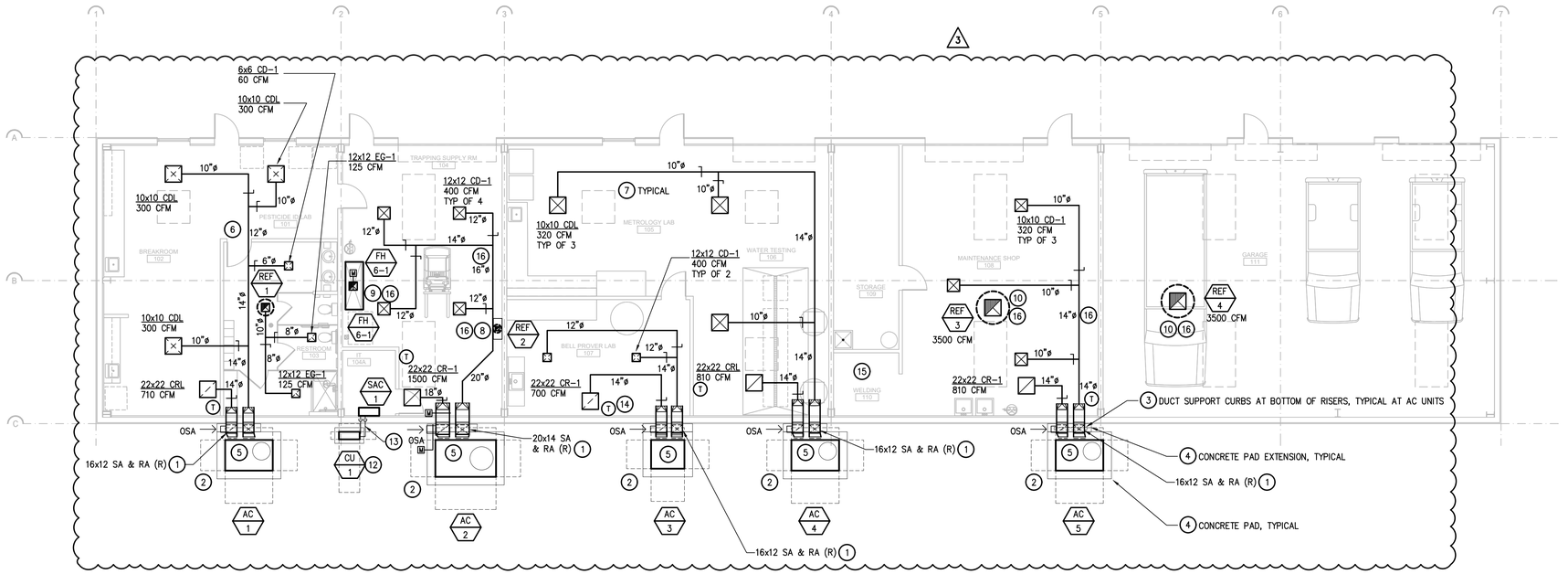
1. FOR SUPPORT OF DUCTWORK SEE DETAILS 4/M5.1 AND 5/M5.1. HOLD DUCTWORK IN SPACES HIGH AS POSSIBLE. ROOF PEAK AT 22'-10" AND ROOF AT WALLS AT 18'-6", SEE ARCH A3.0
2. SEE ARCH AND STRUCTURAL DWGS FOR CONCRETE PADS AT AC UNITS AND AC UNIT DUCTS.
3. FIELD COORDINATE THERMOSTAT LOCATIONS WITH OWNER AND BLDG USERS AND WITH FINAL BLDG MISC EQUIPMENT, CABINETS ETC. FOR FINAL THERMOSTAT LOCATIONS PRIOR TO INSTALLATION OR WIRING.
4. CAREFULLY COORDINATE DUCT ROUTING WITH SKYLIGHT TO AVOID CONFLICT AND SO A TO NOT BLOCK LIGHTING IN ROOM FROM SKYLIGHT.
5. THE STRUCTURAL AND ROOFS AND WALLS OF THE METAL BUILDING MAY NOT BE DESIGNED UNTIL THE CONSTRUCTION PHASE OF THE PROJECT WHEN THE METAL BUILDING FRAMING ETC WILL BE FINALIZED. FIELD COORDINATE ACTUAL FINAL METAL BUILDING CONDITIONS FOR DUCT AND PIPE SUPPORTS AND WALL MOUNTED EQUIPMENT.
6. SEE ARCH REFLECTED CEILING PLAN F3/A2.1 FOR EXACT LOCATION OF DIFFUSER AND GRILLES AT CEILINGS.

PLAN SHEET NOTES CONTINUED

14. SET PROGRAMMABLE THERMOSTAT TO DEAD-BAND TO MAINTAIN ROOM AT PLUS OR MINUS 2 DEGREES FAHRENHEIT IN BELL PROVER LAB.
15. PORTABLE WELDER FOR USE IN SHOP ON RARE OCCASIONS. SEE CONTROLS SEQUENCE NOTES FOR CONTROL OF EXHAUST FAN, DOORS AND AC UNIT DURING WELDING.
16. FOR EXPOSED DUCT IN AREAS WITHOUT CEILING PROVIDE DUCT WORK WITH GOOD APPEARANCE AND FINISH. SEE NOTE 23 ON SHEET M0.1.

PLAN SHEET NOTES

1. PROVIDE SA & RA DUCTS AS SHOWN (SEE PLAN FOR DUCT SIZES) FROM AC UNIT AND RISE AT EXTERIOR WALL TO APPROX 16'-0" AFF (TO BOTTOM OF DUCT, GUTTER AT APPROX 18'-0" AFF) BELOW EDGE OF ROOF WITH GUTTER. SEE ROOF PLAN F5/A2.1 AND WEST ELEVATION F3/A3.0 FOR ROOF CONDITIONS. ROUTE 16x12 SA & RA DUCTS THRU WALL, SEE 2/M5.1 FOR WALL DETAIL. FIELD COORDINATE METAL BUILDING CONSTRUCTION AT WALL FOR DUCT PENETRATIONS FOR WATERIGHT ASSEMBLY. PROVIDE FIELD COORDINATION FOR GOOD DUCT FIT AND APPEARANCE AT EXTERIOR WALL. SEE NOTE 16 ON M0.1 FOR EXTERIOR BOARD INSULATION AND METAL JACKET ON EXTERIOR SA & RA DUCTS. EXTERIOR INSULATION/JACKET ON DUCTS NOT SHOWN ON PLANS FOR CLARITY. HOLD DUCT AWAY FROM WALL TO ALLOW FOR FLASHING AND DUCT PENETRATION WORK, SEE 2/M5.1 & 3/M5.2.
2. PROVIDE FACTORY REQUIRED MAINTENANCE CLEARANCES AROUND AC UNIT.
3. PROVIDE "THYCURB" MODEL TEMS-3 GSM DUCT SUPPORT CURB AT BOTTOM OF SA DUCT RISER AND RA DUCT RISER AT DUCT ELBOWS AND AT AC UNIT CONNECTIONS (ONE CONTINUOUS CURB, TWO LOCATIONS AT EACH AC UNIT). ANCHOR DUCT SUPPORT CURB TO CONCRETE PAD WITH 1/2ø "HILTI" KWIK BOLT TZ SS CONCRETE ANCHOR BOLTS, 3 BOLTS EACH SIDE OF CURB THRU CURB FLANGES, MIN 2" EMBEDMENT. PROVIDE 20 GA GSM DUCT STRAP FROM CURB UP SIDES AND OVER TOP OF EACH DUCT, ATTACH DOUBLED STRAP TO CURB AT EACH SIDE OF DUCT WITH TWO GALV SHEET METAL SCREWS (FOUR TOTAL INTO EACH CURB, COVER SCREW AT CURB WITH HEAVY MASTIC FOR WATER PROOFING), ATTACH STRAP TO EACH SIDE OF DUCT (NOT TOP) WITH TWO GALV SHEET METAL SCREWS (FOUR TOTAL IN EACH DUCT).
4. CONCRETE HOUSEKEEPING PAD AT EACH AC UNIT, 12" BEYOND AC UNIT EDGE ALL AROUND, SEE 1/M5.1. SEE AC UNIT SCHEDULE ON M0.2 FOR UNIT SIZES. PROVIDE PAD EXTENSION FOR DUCT SUPPORTS.
5. PROVIDE GSM DIVERTERS AT ROOF GUTTER TO PREVENT WATER FROM SHEET DRAINING OR LEAKING ONTO DUCTWORK AND AC UNIT BELOW EDGE OF ROOF. SEE ARCH DWGS FOR COORDINATION.
6. UNERCUT DOOR 1-1/2" FOR EXHAUST AIR TRANSFER OF 190 CFM, SEE ARCH DWGS.
7. TYPICAL SKYLIGHT, SEE ARCH PLANS, SEE F3/A2.1 ARCH REFLECTED CEILING PLAN.
8. VENTILATED HAZARDOUS STORAGE CABINET, SEE ARCH DRAWINGS. CABINET SHALL BE EXHAUSTED AT 100 CFM AT ALL TIMES FOR STORAGE OF HAZARDOUS TRAPPING SUPPLIES. EXTEND 6"ø GSM DUCT FROM TOP OR SIDE OF CABINET THRU ROOF WITH DUCT THRU ROOF CURB. PROVIDE GOOSE NECK DUCT AT ROOF WITH INSECT SCREEN EXTENDED MIN 24" ABOVE ROOF PEAK. EXHAUST FAN OPERATION IS CONTINUOUS, CBBD NOT ALLOWED.
9. TRAPPING SUPPLY FUME HOOD (BY OWNER) SHALL BE EXHAUSTED WHEN NEEDED BY TRAINED COUNTY PERSONNEL ONLY VIA A UNIT SWITCH PER CURRENT COUNTY OPERATION PROCEDURES. NO TRAPPING SUPPLY CHEMICALS SHALL BE STORED IN THE FUME HOOD. TRAPPING SUPPLY CHEMICALS SHALL NEVER BE LEFT IN THE FUME HOOD WITH THE HOOD OFF, SEE NOTE 8 ABOVE. EXTEND 12x12 GSM DUCT FROM TOP OF HOOD THRU ROOF WITH DUCT THRU ROOF CURB. PROVIDE GOOSE NECK DUCT AT ROOF WITH INSECT SCREEN EXTENDED MIN 24" ABOVE ROOF PEAK. PROVIDE TWO POSITION MOTORIZED EA CONTROL DAMPER TO OPEN WHEN FAN IS ON AND CLOSE WHEN FAN IS OFF (CBBD NOT ALLOWED). INTERLOCK EA, RA AND OSA DAMPERS TO HOOD SWITCH WITH RELAYS AS REQUIRED FOR OPERATION. WITH FUME HOOD OFF RETURN 1500 CFM TO AC-2 AND PROVIDE 100 CFM OSA. WITH FUME HOOD ON RETURN 800 CFM TO AC-2 AND PROVIDE 800 CFM OSA.
10. PROVIDE 24x24 EXHAUST DUCT THRU ROOF TO EXHAUST FAN. TERMINATE DUCT WITHIN ROOM UP HIGH WITH OPEN ENDED DUCT WITH BIRD SCREEN.
11. NOT USED.
12. ANCHOR OUTDOOR CONDENSING UNIT TO SLAB WITH FOUR "HILTI" KWIK BOLT SS TZ 3/8"ø CONCRETE ANCHOR BOLTS, TWO BOLTS EACH SIDE OF UNIT AT FACTORY TABS (FOUR BOLTS TOTAL), MIN 2" EMBEDMENT.
13. PROVIDE REFRIGERANT PIPING TO/FROM OUTDOOR CONDENSING UNIT TO INDOOR WALL MOUNTED UNIT, SEE M0.2 SCHEDULE FOR PIPE SIZES. PROVIDE PIPE CLAMP AT EACH SUPPORT CURB WITH CHANNEL AT TOP OF CURB, SEE 2/M5.2.



HVAC FLOOR PLAN
SCALE: 1/8" = 1'-0"
SEE ARCH RCP F3/A2.1

1 M2.1

NORTH

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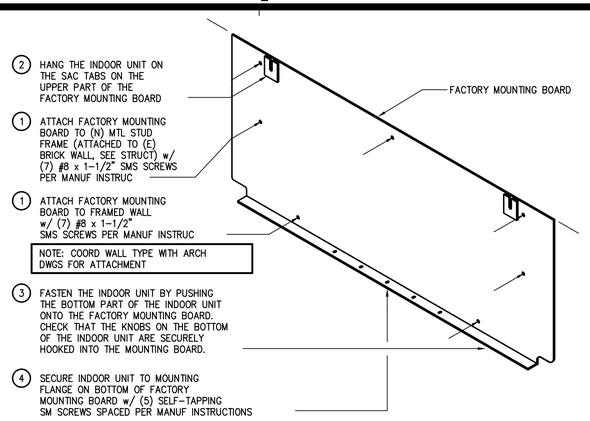
CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
3	7/29/2024	ALL ELECTRIC

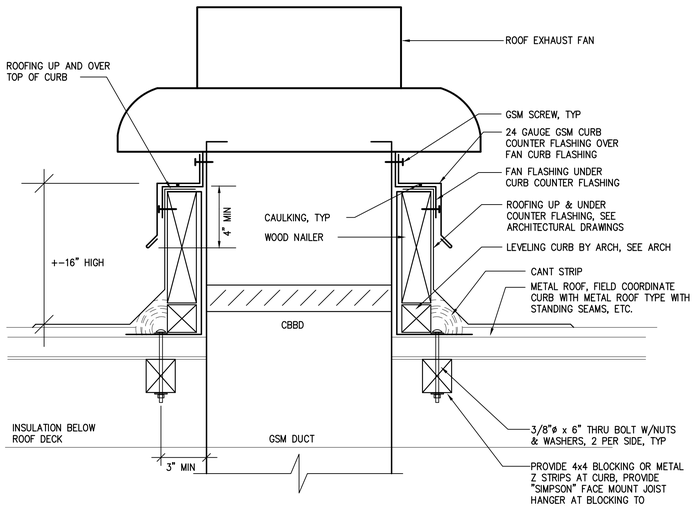
DATE 12/11/2023
DRAWN NEB
JOB NO. 22039
SHEET M2.1
HVAC FLOOR PLAN
OF SHEETS



INDOOR UNIT MOUNTING

SCALE: NONE (NOTE: MOUNT PER FACTORY INSTRUCTIONS)

7 / M5.1

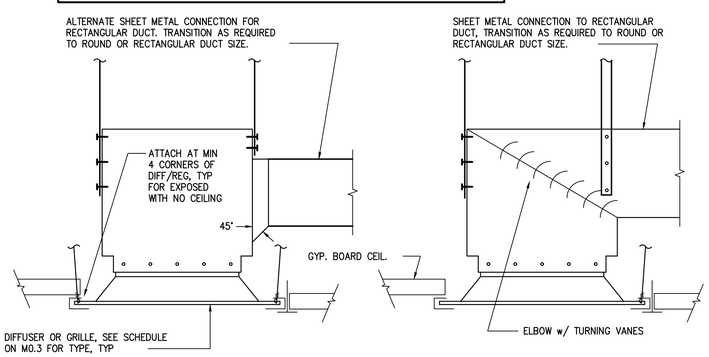


EXHAUST FAN MOUNTING

SCALE: NONE

6 / M5.1

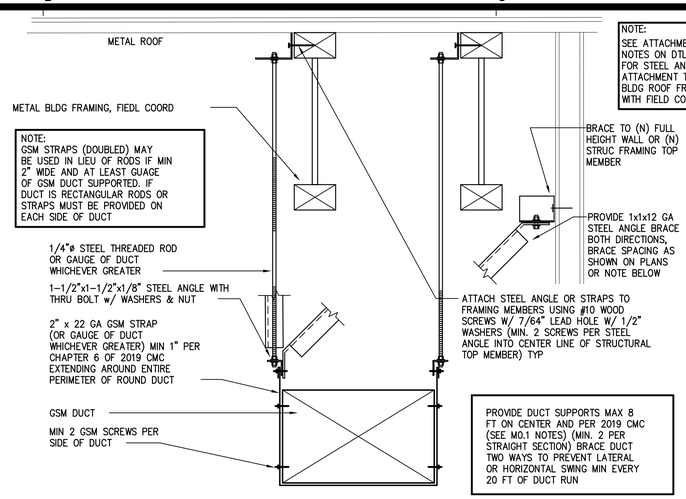
NOTE:
SUPPORT FLEX DUCT PER THE 2019 CMC MAX 48" OC. FLEX DUCT SHALL NOT BE ALLOWED FOR ANY EXHAUST DUCT, OR ON ANY SUPPLY OR RETURN DIFFUSER/GRILLE IN EXPOSED AREAS WITHOUT CEILINGS.



GRILLE/ REGISTER/ DIFFUSER MOUNTING

SCALE: NONE

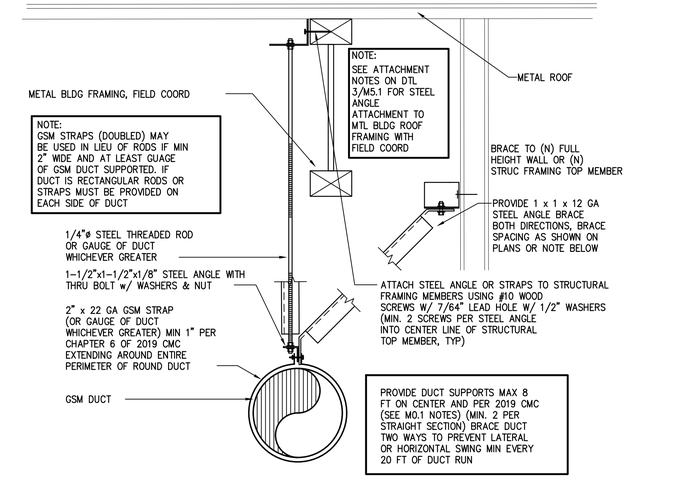
3 / M5.1



RECTANGULAR DUCT MOUNTING

SCALE: NONE

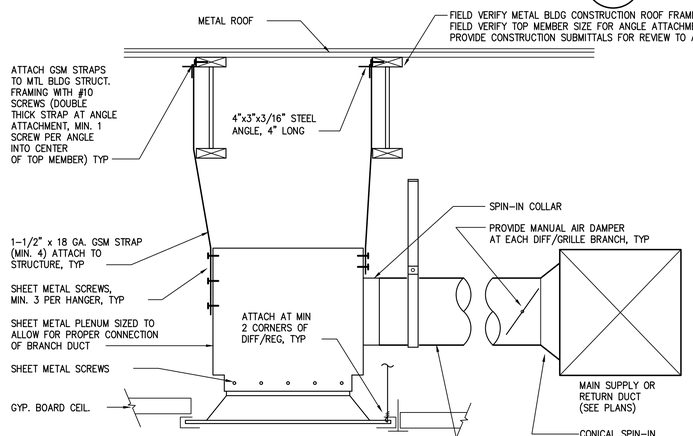
5 / M5.1

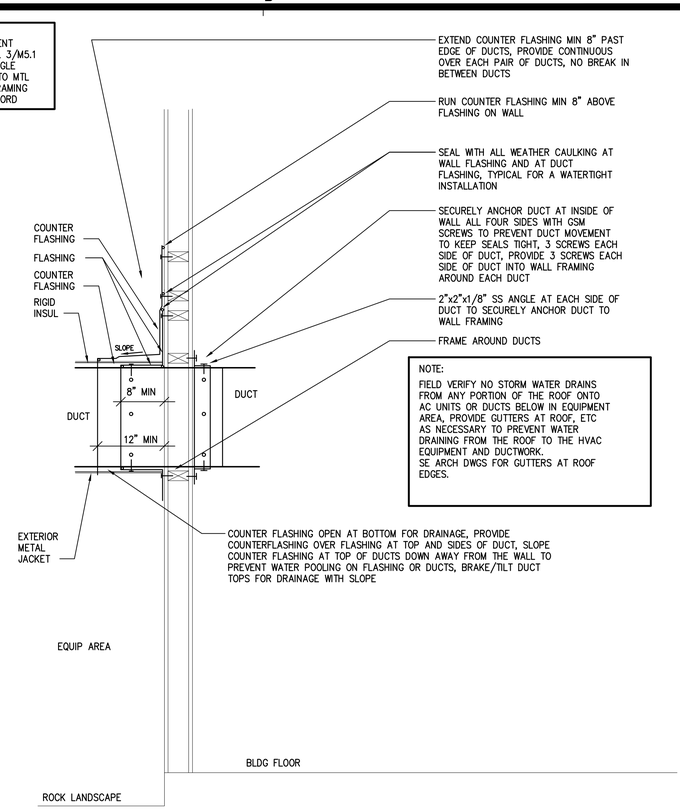


ROUND DUCT MOUNTING

SCALE: NONE

4 / M5.1

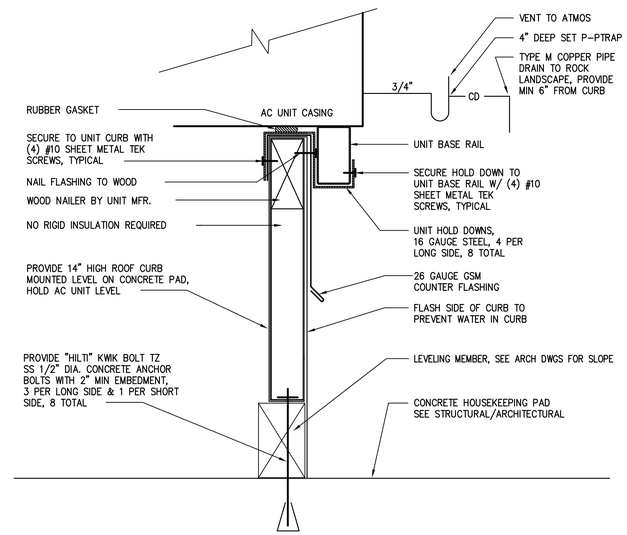




THRU THE WALL DUCT

SCALE: NONE

2 / M5.1



PACKAGE AC UNIT MOUNTING

SCALE: NONE

1 / M5.1

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DATE	12/11/2023
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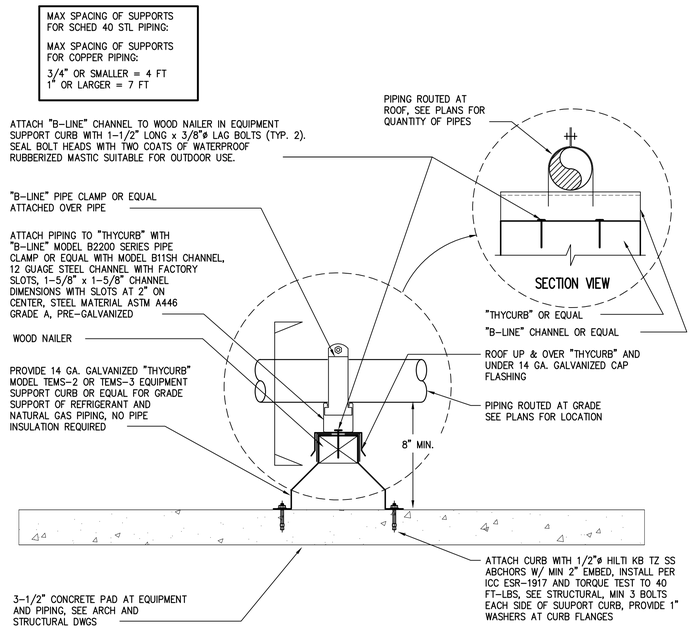
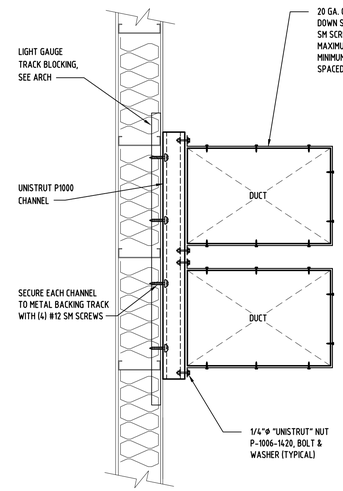
JOB NO.	22039
SHEET	M5.1
HVAC DETAILS	
OF	SHEETS



RIGID PIPE SUPPORT AT CONCRETE

SCALE: NONE

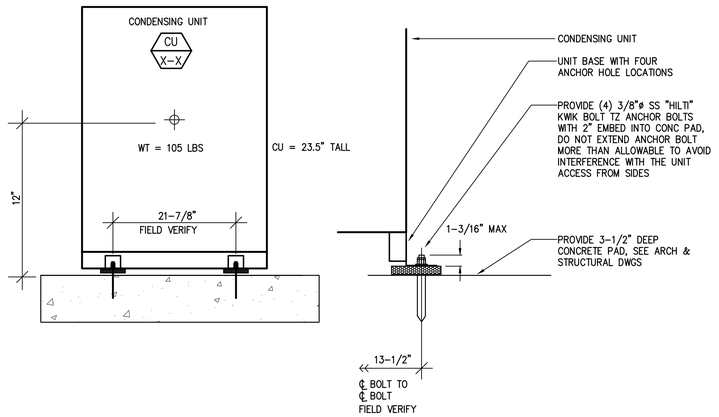
2 / M5.2



VERTICAL EXTERIOR DUCT SUPPORT

SCALE: NONE

3 / M5.2



OUTDOOR CONDENSING UNIT

SCALE: NONE

1 / M5.2

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DATE	12/11/2023
DRAWN	NEB
JOB NO.	22039
SHEET	M5.2
HVAC DETAILS	
OF	SHEETS

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 9 of 12
Project Address:	120 w Main Street Woodland	Calculation Date/Time:	09:29, Fri, Aug 23, 2024
Input File Name:	Yolo County Ag Shop - 2024-08-15.cbd19x		

L. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections shall be made by Documentation Author to indicate which Certificates of Installation must be submitted for the features to be recognized for compliance. These documents must be retained and provided to the building inspector during construction and can be found online at: https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Building Component	Form/Title
Envelope	NRCI-ENV-01-E - Must be submitted for all buildings
Mechanical	NRCI-MCH-01-E - Must be submitted for all buildings
Plumbing	NRCI-PLB-01-E - Must be submitted for all buildings

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 10 of 12
Project Address:	120 w Main Street Woodland	Calculation Date/Time:	09:29, Fri, Aug 23, 2024
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M. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

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Building Component	Form/Title
Mechanical	NRCA-MCH-02-A Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap
	NRCA-MCH-03-A Constant Volume Single Zone HVAC
	NRCA-MCH-13-A Automatic Demand Shed Controls
	NRCA-MCH-13-A Automatic FDD for Air Handling Units and Zone Terminal Units Acceptance

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 11 of 12
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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Steffi Carter	
Company: Quality Built	
Address: 336 West Main Street	Signature: Steffi Carter
City/State/Zip: Ripon, CA 95366	Signature Date: 2024-08-23
Phone:	CEA/ HERS Certification Identification (if applicable): 0F6B-1147-585D-8044-FEC3-5845-9E23-0FC5-6859-8465-48F1-3419-8557-6188-5F8F-8402

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Envelope Designer Name:	Signature:
Company:	
Address:	Date Signed:
City/State/Zip:	
Phone:	Title: License #:
Responsible Lighting Designer Name:	Signature: NOT IN SCOPE
Company:	
Address:	Date Signed:
City/State/Zip:	
Phone:	Title: License #:
Responsible Mechanical Designer Name: - specify -	Signature:
Company:	
Address:	Date Signed:
City/State/Zip:	

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 5 of 12
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G3. OPAQUE SURFACE ASSEMBLY SUMMARY

1	2	3	4	5	6	7	8	9	10
Surface Name	Surface Type	Area (ft²)	Framing Type	Cavity R-Value	Continuous R-Value	Units	Value	Description of Assembly Layers	Status
Metal Building Wall9	ExteriorWall	4124	NA	19	NA	U-Factor	0.070	Metal Siding - 1/16 in. Metal building wall, double layer batt, R-0	N
Metal Building Roof11	Roof	5915	NA	36	NA	U-Factor	0.060	Metal Standing Seam - 1/16 in. Metal standing seam roof, R-0	N
Slab On Grade13	UndergroundFloor	5915	NA	0	NA	F-Factor	0.73	Slab Type = UnheatedSlabOnGrade Insulation Orientation = None Insulation R-Value = R0	N
Demising Wall15	InteriorWall	850	NA	0	NA	U-Factor	0.337	Vapor permeable felt - 1/8 in. Air - Cavity - Wall Roof Ceiling - 4 in. or more Gypsum Board - 1/2 in.	N

Status: N - New, A - Altered, E - Existing

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H1. DRY SYSTEM EQUIPMENT (furnaces, air handling units, heat pumps, VRF, economizers etc.)

1	2	3	4	5	6	7	8	9	10	11	12
			Heating				Cooling				
Equipment Name	Equipment Type	Qty	Total Heating Output (kBtu/h)	Supp Heat Output (kBtu/h)	Efficiency Unit	Efficiency	Total Cooling Output (kBtu/h)	Efficiency Unit	Efficiency	Economizer Type (if present)	Status
AC1	SZHP (Package03Phase)	1	27	0	HSPF	8.00	34	SEER/EER	14.30/12.10	NoEconomizer	N
AC2	SZHP (Package03Phase)	1	36	0	HSPF	8.20	46	SEER/EER	14.30/12.10	NoEconomizer	N
AC3	SZHP (Package03Phase)	1	23	0	HSPF	8.20	24	SEER/EER	14.10/11.40	NoEconomizer	N
AC4	SZHP (Package03Phase)	1	27	0	HSPF	8.00	33	SEER/EER	14.30/12.10	NoEconomizer	N
AC5	SZHP (Package03Phase)	1	27	0	HSPF	8.00	33	SEER/EER	14.30/12.10	NoEconomizer	N

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 7 of 12
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H4. Wet System Equipment(boilers,chillers,cooling towers,etc.)

This Section Does Not Apply

H5. PUMPS

This Section Does Not Apply

H6. SYSTEM SPECIAL FEATURES

1	2	3	4
System Name	Equipment Type	Windows Interlocks per §140.4(n)	Other Special Features and Controls
DHW1 - SHW	Service Hot Water, Primary Only	NA	Fixed Temperature Control

Notes: This table includes content added to the performance path only. For projects using the prescriptive path, mandatory and prescriptive compliance requirements are documented on the MECH-MAN-E

H7. NONRESIDENTIAL VENTILATION

1	2	3	4	5	6	7
		Mechanical Ventilation				
Zone Name	Ventilation Function	# of people	Supply OA CFM	Exhaust CFM	Conditioned Area (sf)	DCV or Occupant Sensor Controls, or Both
1-Restroom	Exhaust - Toilets, public Office - Breakrooms	25.91	366	250	1033	NA
2-Trapping Supply Room	Misc - All others	3.15	95	0	630	NA
3-Bell Prover Lab	Misc - All others	1.76	53	0	353	NA
4-Metrology Lab	Misc - All others	5.13	154	0	1027	NA
5-Maint Shop	Misc - All others	5.78	173	0	1155	NA
7-IT Room	General - Unoccupied	0.09	0	0	60	NA

H8. HIGH-RISE RESIDENTIAL DWELLING UNIT AND HOTEL/MOTEL VENTILATION

This Section Does Not Apply

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H9. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY

1	2	3	4	5	6	7	8	9	10	11	12	13
				Rated Capacity (kBtu/h)			Airflow (cfm)			Fan		
System ID	Zone Name	System Type	Qty	Heating	Cooling	Design	Min.	Min. Ratio	Power	Power Units	Cycles	VSD
CU1	7-IT Room	MiniSplitHP	1	12.00	12.00	400	NA	0.00	0.026	bhp	NA	☐
1-Restroom-Trm	1-Restroom	Uncontrolled	1	NA	NA	960	NA	0.00	0.330	bhp	NA	☐
2-Trapping Supply Room-Trm	2-Trapping Supply Room	Uncontrolled	1	NA	NA	1600	NA	0.00	0.330	bhp	NA	☐
3-Bell Prover Lab-Trm	3-Bell Prover Lab	Uncontrolled	1	NA	NA	800	NA	0.00	0.330	bhp	NA	☐
4-Metrology Lab-Trm	4-Metrology Lab	Uncontrolled	1	NA	NA	960	NA	0.00	0.330	bhp	NA	☐
5-Maint Shop-Trm	5-Maint Shop	Uncontrolled	1	NA	NA	960	NA	0.00	0.330	bhp	NA	☐

H10. EVAPORATIVE COOLER SUMMARY

This Section Does Not Apply

H11. HEAT RECOVERY SUMMARY

This Section Does Not Apply

I1. WATER HEATER EQUIPMENT SUMMARY

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Name	Heater Element Type	Tank Type	Qty	Tank Vol (gal)	Rated Input	Rated Input Unit	Efficiency	Efficiency Unit	Tank Insulation R-value (hr•ft²•°F/Btu)	Standby Loss Fraction	1st Hour Rating or Flow Rate (gal)	Heat Pump Type	Tank Location or Ambient Condition
A O Smith BT-602	Gas	Storage	1	55.00	60	kBtu/h	0.80	UEF	NA	NA	65	NA	NA

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 1 of 12
Project Address:	120 w Main Street Woodland	Calculation Date/Time:	09:29, Fri, Aug 23, 2024
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A. GENERAL INFORMATION

1	Project Location (city)	Woodland	8	Standards Version	Compliance2019
2	CA Zip Code		9	Compliance Software (version)	Energy+Pro 8.3
3	Climate Zone	12	10	Weather File	SACRAMENTO-METRO_724839_CZ2010.epw
4	Total Conditioned Floor Area in Scope	4,258 ft²	11	Building Orientation (deg)	IN] 0 deg
5	Total Unconditioned Floor Area	1,657 ft²	12	Permitted Scope of Work	NewEnvelopeAndMechanical
6	Total # of Stories (Habitable Above Grade)	1	13	Building Type(s)	Nonresidential
7	Total # of dwelling units	0	14	Gas Type	NaturalGas

B. PROJECT SUMMARY

Table Instructions: Table B shows which building components are included in the performance calculation. If indicated as not included, the project must show compliance prescriptively if within permit application.

Building Components Complying via Performance				Building Components Complying Prescriptively	
Envelope (see Table G)	☒ Performance ☐ Not Included	Covered Process: Commercial Kitchens	☐ Performance ☒ Not Included	*The following building components are ONLY eligible for prescriptive compliance and should be documented on the NRCC form listed if within the scope of the permit application (i.e. compliance will not be shown on the NRCC-PRF-E).*	
Mechanical (see Table H)	☒ Performance ☐ Not Included	Covered Process: Computer Rooms	☐ Performance ☒ Not Included	Indoor Lighting (Unconditioned)§140.6	NRCC-LTI-E
				Outdoor Lighting §140.7	NRCC-LTO-E
Domestic Hot Water (see Table I)	☒ Performance ☐ Not Included	Covered Process: Laboratory Exhaust	☐ Performance ☒ Not Included	Sign Lighting §140.8	NRCC -LTS-E
				Mandatory Measures	
Lighting (Indoor Conditioned, see Table K)	☐ Performance ☒ Not Included			*Electrical power systems, commissioning, solar ready, elevator and escalator requirements are mandatory and should on the NRCC form listed if applicable (i.e. compliance will not be shown on the NRCC-PRF-E.)*	
				Electrical Power Distribution §110.11	NRCC-ELC-E
Solar Thermal Water Heating (see Table I)	☐ Performance ☒ Not Included			Commissioning §120.8	NRCC-CXR-E
				Solar Ready §110.10	NRCC-SR4-E

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C1. COMPLIANCE RESULTS FOR PERFORMANCE COMPONENTS (Annual TDV Energy Use, kBtu/ft² -yr)

COMPLIES

Energy Component	Standard Design (TDV)	Proposed Design (TDV)	Compliance Margin (TDV)[1]
Space Heating	19.57	38.97	-19.40
Space Cooling	52.74	52.26	0.48
Indoor Fans	81.90	59.14	22.76
Heat Rejection	--	-	--
Pumps & Misc.	--	-	--
Domestic Hot Water	6.18	3.91	2.27
Indoor Lighting	29.34	29.34	--
ENERGY STANDARDS COMPLIANCE TOTAL	**189.73**	**183.62**	**6.11 (3.2%)**

[1] Notes: The number in parenthesis following the Compliance Margin in column 4. represents the Percent Better than Standard.

C2. RESULTS FOR 'ABOVE CODE' QUALIFICATIONS[1]

☐This project is pursuing CalGreen Tier 1 ☐This project is pursuing CalGreen Tier 2

Miscellaneous Energy Component	Standard Design (TDV)	Proposed Design (TDV)	Compliance Margin (TDV)[1]
Receptacle	108.34	108.34	--
Process	--	--	--
Other Lig	9.91	9.91	--
Process Motors	--	--	--
COMPLIANCE TOTAL PLUS MISCELLANEOUS COMPONENTS	**307.98**	**301.87**	**6.1 (2.0%)**

[1] Notes: This table is used to document compliance with programs OTHER THAN Title 24 Part 6, if applicable.

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C3. ENERGY USE SUMMARY

Energy Component	Standard Design Site (MWh)	Proposed Design Site (MWh)	Margin (MWh)	Standard Design Site (MBtu)	Proposed Design Site (MBtu)	Margin (MBtu)
Space Heating	--	6.8	-6.8	41.5	--	41.5
Space Cooling	5.1	4.4	0.7	--	--	--
Indoor Fans	12.0	8.7	3.3	--	--	--
Heat Rejection	--	--	--	--	--	--
Pumps & Misc.	--	--	--	--	--	--
Domestic Hot Water	0.0	--	--	14.6	9.3	5.3
Indoor Lighting	4.4	4.4	0.0	--	--	--
Compliance Total	**21.5**	**24.3**	**-2.8**	**56.1**	**9.3**	**46.8**
Receptacle	16.4	16.4	0.0	--	--	--
Process	--	--	--	--	--	--
Other Lig	1.5	1.5	0.0	--	--	--
Process Motors	--	--	--	--	--	--
TOTAL	**39.4**	**42.2**	**-2.8**	**56.1**	**9.3**	**46.8**

D. EXCEPTIONAL CONDITIONS

This project includes partial performance compliance scope options. The building must show compliance with all other applicable compliance scope options (performance or prescriptively) before occupying.

E. HERS VERIFICATION

This Section Does Not Apply

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 4 of 12
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G1. ENVELOPE GENERAL INFORMATION (conditioned spaces only)

1	2	3	4
Opaque Surfaces & Orientation	Total Gross Surface Area (ft²)	Total Fenestration Area (ft²)	Window to Wall Ratio (%)
North-Facing[1]	1,233 ft²	0 ft²	00.0%
East-Facing[2]	0 ft²	0 ft²	00.0%
South-Facing[3]	1,212 ft²	0 ft²	00.0%
West-Facing[4]	350 ft²	0 ft²	00.0%
Total	**2,794 ft²**	**0 ft²**	**00.0%**
Roof	4,258 ft²	0 ft²	00.0%

Notes:
[1] North-Facing is oriented to within 45 degrees of true north, including 45°00'00" east of north (NE), but excluding 45°00'00" west of north (NW).
[2] East-Facing is oriented to within 45 degrees of true east, including 45°00'00" south of east (SE), but excluding 45°00'00" north of east (NE).
[3] South-Facing is oriented to within 45 degrees of true south, including 45°00'00" west of south (SW), but excluding 45°00'00" east of south (SE).
[4] West-Facing is oriented to within 45 degrees of true west, including 45°00'00" north of due west (NW), but excluding 45°00'00" south of west (SW).

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H4. Wet System Equipment(boilers,chillers,cooling towers,etc.)

This Section Does Not Apply

H5. PUMPS

This Section Does Not Apply

H6. SYSTEM SPECIAL FEATURES

1	2	3	4
System Name	Equipment Type	Windows Interlocks per §140.4(n)	Other Special Features and Controls
DHW1 - SHW	Service Hot Water, Primary Only	NA	Fixed Temperature Control

Notes: This table includes content added to the performance path only. For projects using the prescriptive path, mandatory and prescriptive compliance requirements are documented on the MECH-MAN-E

H7. NONRESIDENTIAL VENTILATION

1	2	3	4	5	6	7
		Mechanical Ventilation				
Zone Name	Ventilation Function	# of people	Supply OA CFM	Exhaust CFM	Conditioned Area (sf)	DCV or Occupant Sensor Controls, or Both
1-Restroom	Exhaust - Toilets, public Office - Breakrooms	25.91	366	250	1033	NA
2-Trapping Supply Room	Misc - All others	3.15	95	0	630	NA
3-Bell Prover Lab	Misc - All others	1.76	53	0	353	NA
4-Metrology Lab	Misc - All others	5.13	154	0	1027	NA
5-Maint Shop	Misc - All others	5.78	173	0	1155	NA
7-IT Room	General - Unoccupied	0.09	0	0	60	NA

H8. HIGH-RISE RESIDENTIAL DWELLING UNIT AND HOTEL/MOTEL VENTILATION

This Section Does Not Apply

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 8 of 12
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H9. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY

1	2	3	4	5	6	7	8	9	10	11	12	13
				Rated Capacity (kBtu/h)			Airflow (cfm)			Fan		
System ID	Zone Name	System Type	Qty	Heating	Cooling	Design	Min.	Min. Ratio	Power	Power Units	Cycles	VSD
CU1	7-IT Room	MiniSplitHP	1	12.00	12.00	400	NA	0.00	0.026	bhp	NA	☐
1-Restroom-Trm	1-Restroom	Uncontrolled	1	NA	NA	960	NA	0.00	0.330	bhp	NA	☐
2-Trapping Supply Room-Trm	2-Trapping Supply Room	Uncontrolled	1	NA	NA	1600	NA	0.00	0.330	bhp	NA	☐
3-Bell Prover Lab-Trm	3-Bell Prover Lab	Uncontrolled	1	NA	NA	800	NA	0.00	0.330	bhp	NA	☐
4-Metrology Lab-Trm	4-Metrology Lab	Uncontrolled	1	NA	NA	960	NA	0.00	0.330	bhp	NA	☐
5-Maint Shop-Trm	5-Maint Shop	Uncontrolled	1	NA	NA	960	NA	0.00	0.330	bhp	NA	☐

H10. EVAPORATIVE COOLER SUMMARY

This Section Does Not Apply

H11. HEAT RECOVERY SUMMARY

This Section Does Not Apply

I1. WATER HEATER EQUIPMENT SUMMARY

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Name	Heater Element Type	Tank Type	Qty	Tank Vol (gal)	Rated Input	Rated Input Unit	Efficiency	Efficiency Unit	Tank Insulation R-value (hr•ft²•°F/Btu)	Standby Loss Fraction	1st Hour Rating or Flow Rate (gal)	Heat Pump Type	Tank Location or Ambient Condition
A O Smith BT-602	Gas	Storage	1	55.00	60	kBtu/h	0.80	UEF	NA	NA	65	NA	NA

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 3 of 12
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C3. ENERGY USE SUMMARY

Energy Component	Standard Design Site (MWh)	Proposed Design Site (MWh)	Margin (MWh)	Standard Design Site (MBtu)	Proposed Design Site (MBtu)	Margin (MBtu)
Space Heating	--	6.8	-6.8	41.5	--	41.5
Space Cooling	5.1	4.4	0.7	--	--	--
Indoor Fans	12.0	8.7	3.3	--	--	--
Heat Rejection	--	--	--	--	--	--
Pumps & Misc.	--	--	--	--	--	--
Domestic Hot Water	0.0	--	--	14.6	9.3	5.3
Indoor Lighting	4.4	4.4	0.0	--	--	--
Compliance Total	**21.5**	**24.3**	**-2.8**	**56.1**	**9.3**	**46.8**
Receptacle	16.4	16.4	0.0	--	--	--
Process	--	--	--	--	--	--
Other Lig	1.5	1.5	0.0	--	--	--
Process Motors	--	--	--	--	--	--
TOTAL	**39.4**	**42.2**	**-2.8**	**56.1**	**9.3**	**46.8**

D. EXCEPTIONAL CONDITIONS

This project includes partial performance compliance scope options. The building must show compliance with all other applicable compliance scope options (performance or prescriptively) before occupying.

E. HERS VERIFICATION

This Section Does Not Apply

Project Name:	Yolo County Ag Building	NRCC-PRF-01-E	Page 4 of 12
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G1. ENVELOPE GENERAL INFORMATION (conditioned spaces only)

1	2	3	4
Opaque Surfaces & Orientation	Total Gross Surface Area (ft²)	Total Fenestration Area (ft²)	Window to Wall Ratio (%)
North-Facing[1]	1,233 ft²	0 ft²	00.0%
East-Facing[2]	0 ft²	0 ft²	00.0%
South-Facing[3]	1,212 ft²	0 ft²	00.0%
West-Facing[4]	350 ft²	0 ft²	00.0%
Total	**2,794 ft²**	**0 ft²**	**00.0%**
Roof	4,258 ft²	0 ft²	00.0%

Notes:
[1] North-Facing is oriented to within 45 degrees of true north, including 45°00'00" east of north (NE), but excluding 45°00'00" west of north (NW).
[2] East-Facing is oriented to within 45 degrees of true east, including 45°00'00" south of east (SE), but excluding 45°00'00" north of east (NE).
[3] South-Facing is oriented to within 45 degrees of true south, including 45°00'00" west of south (SW), but excluding 45°00'00" east of south (SE).
[4] West-Facing is oriented to within 45 degrees of true west, including 45°00'00" north of due west (NW), but excluding 45°00'00" south of west (SW).

2019 Low-Rise Residential Mandatory Measures Summary

Building Envelope Measures:

- **§ 110.6(a)1:** **Air Leakage.** Manufactured fenestration, exterior doors, and exterior joel doors must limit air leakage to 0.3 cfm per square foot or less when tested per NFRC-400, ASTM E283 or ANAMW/WDMA/CSA 101/I.S.2/A440-2011.
- **§ 110.6(a)2:** **Labeling.** Fenestration products and exterior doors must have a label meeting the requirements of Section 10-111(a).
- **§ 110.6(b):** **Field fabricated exterior doors and fenestration** products must use U-factors and solar heat gain coefficient (SHGC) values from Tables 110.6-A, 110.6-B, or JA4.5 for exterior doors. They must be caulked and/or weather stripped.
- **§ 110.7:** **Air leakage.** All joints, penetrations, and other openings in the building envelope that are potential sources of air leakage must be caulked, gasketed, or sealed.
- **§ 110.8(a):** **Insulation Certification by Manufacturer.** Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS).
- **§ 110.8(g):** **Insulation Requirements for Heated Slab Floors.** Heated slab floors must be insulated per the requirements of Section 110.8(g).
- **§ 110.8(i):** **Roofing Products Solar Reflectance and Thermal Emittance.** The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(i) and be labeled per §10-113 when the installation of a cool roof is specified on the CF1R.
- **§ 110.8(j):** **Radiant Barrier.** When required, radiant barriers must have an emittance of 0.05 or less and be certified by the Department of Consumer Affairs.
- **§ 150.0(a):** **Ceiling and Roller Roof Insulation.** Minimum R-22 insulation in wood-frame ceiling; or the weighted average U-factor must not exceed 0.041. Minimum R-19 in weighted average U-factor of 0.054 or less in a rafter roof elevation. Attic access doors must have permanently attached insulation using adhesive or mechanical fasteners. The attic access must be gasketed to prevent air leakage. Insulation must be installed in direct contact with a continuous roof or ceiling which is sealed to limit infiltration and exfiltration as specified in § 110.7, including but not limited to stacking insulation either above or below the roof deck or on top of a drywall ceiling.
- **§ 150.0(b):** **Loose-fill Insulation.** Loose fill insulation must meet the manufacturer's required density for the labeled R-value.
- **§ 150.0(c):** **Wall Insulation.** Minimum R-13 insulation in 2x4 inch wood framing wall or have a U-factor of 0.102 or less; or R-20 in 2x6 inch wood framing or have a U-factor of 0.071 or less. (R-19 in 2x6 or U-factor of 0.075 in Climate Zone 16.) Steel-framed walls must have an overall assembly U-factor not exceeding 0.102, equivalent to an installed value of R-13 in a wood framed assembly. Masonry walls must meet Table 150.1-A or B.
- **§ 150.0(d):** **Raised-floor Insulation.** Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor.
- **§ 150.0(d) 5:** **Slab Edge Insulation.** Slab edge insulation must meet all of the following: have a water absorption rate, for the insulation material alone without facings, no greater than 0.3%, have a water vapor permeance no greater than 2.0 perm per inch, be protected from physical damage and UV light deterioration; and, when installed as part of a heated slab floor, meet the requirements of § 110.8(g).
- **§ 150.0(g)1:** **Vapor Retarder.** In climate zones 1 through 16, the earth floor of unvented crawl space must be covered with a Class I or Class II vapor retarder. The requirement also applies to controlled ventilation crawl space for buildings complying with the exception to § 150.0(d).
- **§ 150.0(g)2:** **Protection of Insulation.** Wall insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation in all exterior walls, vented

PLUMBING SYMBOLS

SYMBOL	ABBREV.	DESCRIPTION
A	A	COMPRESSED AIR
AV	AV	ACID VENT
AW	AW	ACID WASTE
		CAP AT END OF PIPE
	CO	CLEANOUT
CO_2	CO_2	CARBON DIOXIDE
CW	CW	DOMESTIC COLD WATER
CD	CD	CONDENSATE DRAIN
DWR	DWR	CHILLED DRINKING WATER RETURN
DWS	DWS	CHILLED DRINKING WATER SUPPLY
DI	DI	DEIONIZED WATER
		DIRECTION OF FLOW ARROW
		EXISTING WASTE OR STORM DRAIN PIPING
FCO	FCO	FLOOR CLEANOUT
2-WAY FCO	2-WAY FCO	TWO-WAY FLOOR CLEANOUT OR GRADE CLEANOUT
FD	FD	FLOOR DRAIN
FS	FS	FLOOR SINK
F	F	FIRE WATER
G	G	NATURAL or PROPANE GAS (LOW PRESSURE)
GCO	GCO	GRADE CLEANOUT
GPR	GPR	GAS PRESSURE REGULATOR
GW	GW	GREASE WASTE
HB	HB	HOSE BIBB
HW	HW	DOMESTIC HOT WATER
HWR	HWR	DOMESTIC HOT WATER RETURN
HW	HW	DOMESTIC HOT WATER PIPING W/ HEAT TRACE TAPE
		LINE CONTINUES
LPG	LPG	LIQUIFIED PETROLEUM GAS
MPG	MPG	MEDIUM PRESSURE GAS
OF	OF	OVERFLOW PIPING
RWL	RWL	RAIN WATER LEADER PIPING
SD	SD	STORM DRAIN PIPING
V	V	VENT PIPING
W	W	WASTE PIPING
TP	TP	TRAP PRIMER
WCO	WCO	WALL CLEANOUT
PW	PW	PUMPED WASTE PIPING
PSD	PSD	PUMPED STORM DRAIN PIPING
VW	VW	VACUUM WASTE PIPING
UD	UD	UNDERDRAIN PIPING
		EXISTING TO BE REMOVED
		PIPE DROP DOWN (TEE)
		PIPE RISER UP (ELBOW)
		PIPE RISER DOWN (ELBOW)
P	POC/POD	POINT OF CONNECTION OR POINT OF DEMOLITION
PG	PG	PRESSURE GAUGE
PS	PS	PRESSURE SWITCH
		PIPE REDUCER
T	TG	TEMPERATURE GAUGE
VC	VC	VACUUM (DENTAL)
BV	BV	BALL VALVE
BFV	BFV	BUTTERFLY VALVE
CBV	CBV	CALIBRATED BALANCE VALVE
		CHECK VALVE
FLV	FLV	FLOW LIMITING VALVE
GC	GC	GAS COCK/VALVE
GSOV	GSOV	GAS SHUT-OFF VLAVE
GSV	GSV	GAS SEISMIC VALVE
GV	GV	GATE VALVE
GLV	GLV	GLOBE VALVE
M	M	2-WAY MOTORIZED CONTROL VALVE
PRV	PRV	PRESSURE REDUCING VALVE
RV or P&TRV	RV or P&TRV	RELIEF VALVE OR PRESSURE & TEMPERATURE RELIEF VALVE
ST	ST	STRAINER
U	U	UNION
OS&Y	OS&Y	OUTSIDE STEM & YOKE VALVE
		VALVE IN RISE/DROP

PLUMBING ABBREVIATIONS

ABBREV.	DESCRIPTION
ABC	ABOVE CEILING
ABV	ABOVE
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AP	ACCESS PANEL
ARCH	ARCHITECT OR ARCHITECTURAL
BEL	BELOW
BF	BELOW FLOOR
BG	BELOW GRADE
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BS	BELOW SLAB
BTU	BRITISH THERMAL UNITS
CFF	CAP FOR FUTURE
CFH	CUBIC FEET OF GAS PER HOUR
CLG	CEILING
CONN	CONNECT OR CONNECTION
CONT	CONTINUATION
(D)	DROP
DR	DRAIN
DN	DOWN
DWG	DRAWING
(E)	EXISTING
EA	EACH
EF	EXHAUST FAN
EFF	EFFICIENCY
ELEC	ELECTRICAL
EQUIP	EQUIPMENT
EWT	ENTERING WATER TEMPERATURE
FA	FROM ABOVE
FB	FROM BELOW
FFE	FINISHED FLOOR ELEVATION
FGE	FINISHED GRADE ELEVATION
FLA	FULL LOAD AMPS
FLR	FLOOR
FSR	FIRE SPRINKLER RISER
FU	FIXTURE UNITS
(F) OR FUT	FUTURE
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
GSM	GALVANIZED SHEET METAL
HD	HEAD
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HZ	HERTZ
IE	INVERT ELEVATION
IN	INCH OR INCHES
KW	KILOWATTS
LBS	POUNDS
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MECH	MECHANICAL
MED	MEDICAL
MFR	MANUFACTURER
MIN	MINIMUM OR MINUTE
MTD	MOUNTED

PLUMBING ABBREVIATIONS

ABBREV.	DESCRIPTION
(N)	NEW
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OH	OVERHEAD
PD	PRESSURE DROP
PLMB	PLUMBING
PSI(G)	POUNDS PER SQUARE INCH (GAUGE)
QTY	QUANTITY
(R)	RISE
REF	REFERENCE
REQ'D	REQUIRED
REV	REVISION
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RV or P&TRV	RELIEF VALVE OR PRESSURE & TEMPERATURE RELIEF VALVE
SIM	SIMILAR
SOV	SHUT-OFF VALVE
SP	STATIC PRESSURE
SPEC	SPECIFICATIONS
SS	STAINLESS STEEL
STD	STANDARD
STRUC	STRUCTURE OR STRUCTURAL
TA	TO ABOVE
TB	TO BELOW
TEMP	TEMPERATURE
THW	TEMPERED HOT WATER
TOS	TOP OF STEEL
TYP	TYPICAL
UF	UNDER FLOOR
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
V	VENT (PLUMBING)
VR	VENT RISER
VTR	VENT THROUGH ROOF
WD	WASTE DROP
WF	WATER FOUNTAIN
WHA	WATER HAMMER ARRESTER
WT	WEIGHT
ZN	ZONE

PLUMBING GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH CALIFORNIA 2019 CPC AND 2019 CBC.
2. DOMESTIC WATER PIPING SHALL BE INSTALLED AND TESTED IN ACCORDANCE 2019 CPC SECTION 609.0. PRESSURE TEST AND FLUSH AND CLEAN AND DISINFECT ALL NEW DOMESTIC WATER PIPING PRIOR TO USE BY BUILDING OCCUPANTS. PRESSURE TEST DOMESTIC WATER PIPING WITH WATER OR AIR AT MINIMUM 50 PSIG AND NOT LESS THAN WORKING PRESSURE OF THE SYSTEM THE PIPING, FIXTURES AND EQUIPMENT MUST WITHSTAND THE TEST PRESSURE FOR NOT LESS THAN 15 MINUTES WITHOUT SHOWING EVIDENCE OF LEAKAGE PER 2019 CPC SECTION 609.4. SEE NOTE 15 BELOW FOR DOMESTIC WATER PIPING MATERIALS ALLOWED TO BE USED. FLUSH AND DISINFECT PIPING PER 2019 CPC 609.9
3. COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO SAW-CUTTING SLAB, TRENCHING OR INSTALLING PIPING AND ASSOCIATED ITEMS. SEE STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR UNDER FLOOR TRENCHING AND (E) CONCRETE FLOOR REPAIR
4. FIELD VERIFY SIZES, LOCATIONS AND ELEVATIONS OF ALL EXISTING AND NEW PIPING CONNECTIONS TO EXISTING AND NEW UTILITIES PRIOR TO SAW-CUTTING SLAB IF ANY REQUIRED, TRENCHING OR INSTALLATION OF NEW WORK.
5. KEEP ALL PLUMBING VENTS THRU ROOF A MINIMUM 10 FEET FROM OUTSIDE AIR INTAKES AND A MINIMUM 4 FEET FROM EXTERIOR WALLS. COORDINATE VENT PENETRATIONS WITH ROOF MATERIAL MANUFACTURER. DO NOT PENETRATE TOP PLATES OF STUD WALLS.
6. PROVIDE LABELING ON ALL PIPES AND VALVES IN THE PLUMBING SYSTEMS. PROVIDE SIGNAGE FOR THE SOURCE SHUT OFF VALVE FOR DOMESTIC WATER PIPING SYSTEM AND FOR NATURAL GAS.
7. ALL VALVES SHALL BE LINE SIZE UNLESS OTHERWISE NOTED.
8. OFFSET ALL PIPING DROPS AND RISERS TO AVOID PENETRATIONS AT FRAMED WALL TOP PLATES OR STRUCTURAL BEAMS.
9. ALL FLOOR DRAINS & FLOOR SINKS LOCATED IN CERAMIC TILE SHALL HAVE A SQUARE TOP MATCHED TO FLOOR SLOPE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING CURRENT REQUIREMENTS WITH THE MANUFACTURER OF THE PRODUCTS USED ON THE PROJECT AND SHALL NOTIFY THE OWNER AND ARCHITECT/ENGINEER OF RECORD IF ANY DISCREPANCIES ARE FOUND PRIOR TO THE PURCHASE OF THE PRODUCT AND PRIOR TO BEGINNING WORK TO INSTALL OWNER FURNISHED PRODUCTS.
11. CONTRACTOR SHALL MAINTAIN RECORDED "AS-BUILT" INFORMATION ON ALL WORK INSTALLED DURING CONSTRUCTION AND IT SHALL BE CLEARLY MARKED IN COLORED PENCIL ON A REPRODUCIBLE PRINT OF SHOP DRAWINGS. RECORDED INFORMATION SHALL INCLUDE ROUTING AND ELEVATIONS. THE CONTRACTOR SHALL TURN RECORDED "AS-BUILT" INFORMATION OVER TO THE OWNER AND/OR RESPONSIBLE DESIGN PROFESSIONAL AT THE COMPLETION OF CONSTRUCTION.
12. FIRE STOPPING OF PENETRATIONS SHALL BE PROVIDED AS REQUIRED, SEE NOTE 13 BELOW. FIRE STOPPING SHALL BE UL LISTED AND SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS. MANUFACTURER'S DIRECTIONS SHALL BE MADE AVAILABLE TO THE INSPECTING AUTHORITY. SEE ARCHITECTURAL DRAWINGS.
13. PENETRATIONS OF PIPES, CONDUIT, ETC. IN FIRE RATED WALLS, ROOFS, AND/OR FLOORS OR RATED ASSEMBLIES REQUIRING PROTECTED OPENINGS SHALL BE FIRE STOPPED ACCORDING TO SECTION 714 OF THE 2019 CBC. MATERIAL SHALL BE A TESTED ASSEMBLY APPROVED BY THE STATE FIRE MARSHAL. FIRE RATING OF THE FIRE STOP SYSTEM SHALL BE EQUAL TO THE ASSEMBLY PENETRATED.
14. INSULATE ALL DOMESTIC HOT WATER PIPING WITHIN THE BUILDING WITH CELLULAR GLASS OR MINERAL FIBER INSULATION PER 2019 TITLE 24 ENERGY STANDARDS REQUIREMENTS. PROVIDE INSULATION WALL THICKNESS OF 1" UP TO 1" DIAMETER PIPE, 1-1/2" THICK ON 1-1/4" & 1-1/2" PIPE AND 2" THICK ON 2" DIA PIPE AND LARGER. INSULATE DOMESTIC COLD WATER PIPING WITH 2" THICK INSULATION IN THE NEW OR EXISTING WALLS AND CEILING SPACES OUTSIDE THE DIRECTLY OR INDIRECTLY CONDITIONED CEILING SPACE (EXTERIOR OF INSULATION ENVELOPE). INSULATE DOMESTIC COLD WATER PIPING ABOVE CEILING SPACES WITHIN BLDG INSULATION ENVELOPE WITH MIN 1/2" THICK INSULATION TO PREVENT CONDENSATION.
15. IT IS PREFERRED THAT TYPE L OR TYPE K COPPER PIPE BE PROVIDED FOR DOMESTIC POTABLE WATER SERVICE, JOINING SHALL BE WITH LEAD-FREE SOLDER-TYPE FITTINGS ONLY. NO PRESS FITTINGS OR NON-COPPER PIPING ALLOWED FOR DOMESTIC WATER. PROVIDE DIELECTRIC FITTINGS AT DISSIMILAR MATERIAL CONNECTIONS. AS A COST SAVINGS OPTION DOMESTIC POTABLE WATER PIPING MAY BE PROVIDED AS CPVC MATERIAL BUT ALL 2019 CPC CODE REQUIREMENTS FOR FLUSHING AND TESTING MUST BE CLOSELY ADHERED TO AND ALL MANUFACTURER'S INSTALLATION INSTRUCTIONS MUST BE FOLLOWED. NO PEX PIPING SHALL BE BURIED, ABOVE GRADE PEX USE ONLY.
16. IT IS PREFERRED THAT CAST IRON SOIL PIPE BE PROVIDED FOR ALL WASTE & VENT PIPING LOCATED WITHIN THE BUILDING (THIS INCLUDES UNDERGROUND PIPING), JOINING SHALL BE WITH HUB & SPIGOT OR BANDED NO-HUB FITTINGS. ONLY AFTER THE UNDERGROUND WASTE PIPING EXITS THE BUILDING FOUNDATION IS PLASTIC PIPING PREFERRED UNDERGROUND. AS A COST SAVINGS OPTION SCHEDULE 40 ABS PIPING MAY BE USED FOR SANITARY WASTE AND VENT PIPING PER 2019 CPC TABLE 701.2 ABOVE GROUND AND UNDER GROUND INSIDE OF THE BUILDING. PER 2019 CPC SECTION 701.2 (2) ABS DWV PIPING INSTALLATIONS SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE STANDARDS REFERENCED IN TABLE 701.2 AND THE FIRE PROTECTION REQUIREMENTS IN THE 2019 CBC. JOINING METHODS FOR ABS PLASTIC PIPING AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND SHALL COMPLY WITH 2019 CPC SECTIONS 705.1.1 THROUGH 705.1.3. AS A COST SAVINGS OPTION SCHEDULE 40 PVC PIPING MAY BE USED FOR SANITARY WASTE AND VENT PIPING PER 2019 CPC TABLE 701.2 UNDER GROUND OUTSIDE OF THE BUILDING FOOTPRINT. PER 2019 CPC SECTION 701.2 (2) PVC DWV PIPING INSTALLATIONS SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE STANDARDS REFERENCED IN TABLE 701.2 AND THE FIRE PROTECTION REQUIREMENTS IN THE 2019 CBC. JOINING METHODS FOR PVC PLASTIC DWV PIPING AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND SHALL COMPLY WITH 2019 CPC SECTIONS 705.6.1 THROUGH 705.6.3. PLASTIC PIPING SHALL NOT BE PRESSURE TESTED FILLED WITH WATER. PROVIDE MINIMUM 1/4" PER FOOT OF SLOPE IN ALL WASTE PIPING. TEST SEWER PIPE PER 2019 CPC SECTION 723.0 FILLED WITH WATER FROM LOWEST TO HIGHEST POINT, THE BLDG SEWER SHALL BE WATERTIGHT.
17. PROVIDE DELEGATED PIPING DESIGN AND SUPPORT LAYOUT FOR PIPING AND SUPPORT LOCATIONS WITH WORK PER 2019 CPC AND AS SHOWN ON DOCUMENTS. ALTERNATE ROUTING CAN BE PROVIDED IN LIEU OF PIPE ROUTING SHOWN ON PLANS TO ACCOMMODATE TIGHT CLEARANCES OR OBSTRUCTIONS SUCH AS DUCTS, PIPES, CONDUITS, STRUCTURAL FRAMING, ETC. PROVIDE SCALED CONTRACTOR SHOP DRAWINGS WITH SUBMITTAL REVIEW BY ARCHITECT AND ENGINEER WITH MIN 1/4" PER FOOT SCALE. SHOP DRAWINGS WILL BE DIMENSIONED AND SHOW ALL PIPING AND SUPPORTS. PROVIDE SUBMITTALS OF ALL HVAC AND PLUMBING WORK INCLUDING EQUIPMENT SUBMITTALS FOR REVIEW BY ARCHITECT AND ENGINEER.
18. OWNER PROVIDED LAB EQUIPMENT RELOCATED FROM ANOTHER SPACE SHALL BE INSTALLED BY OWNER. FIELD COORDINATE WITH OWNER FOR NATURAL GAS, WASTE & VENT AND DOMESTIC WATER AND COMPRESSED AIR PROVISIONS FOR NECESSARY CONNECTIONS TO OWNER PROVIDED AND INSTALLED LAB EQUIPMENT.

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REGISTERED PROFESSIONAL ENGINEER
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M 32515
EXPIRES 9/25
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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DATE 12/11/2023
DRAWN NEB
JOB NO. 22039
SHEET **P0.1**
PLUMBING NOTES & LEGEND
OF SHEETS

PLUMBING FIXTURE SCHEDULE

ADA	FIXTURE TAG	FIXTURE TYPE	FIXTURE MANUFACTURER AND MODEL NO.	VALVE OR FAUCET MANUFACTURER AND MODEL NO.	TRIM MANUFACTURER AND MODEL NO.	NOTES	CONNECTIONS						
							VENT	WASTE		COLD WATER		HOT WATER	
								BRANCH	OUTLET	BRANCH	OUTLET	BRANCH	OUTLET
♿	WC-1	WATER CLOSET FLOOR MOUNTED FLUSH TANK TYPE ADA	"AMERICAN STANDARD" RELIANT 250AA.104 ELONGATED FLUSH TANK TOILET, MODEL 250AA104.020 OR EQUAL FLOOR MOUNTED, VITREOUS CHINA, WATER TANK, RIGHT WIDTH, ELONGATED FRONT, FLUSH TANK HARDWARE AND HANDLE AT TANK.	MANUAL FLUSH TANK HARDWARE AND TANK HANDLE, RATED 1.28 GPF	SEAT: "OLSONITE" MODEL 10CT OR EQUAL, ELONGATED OPEN FRONT SEAT WITH "STA-TITE" COMMERCIAL FASTENING SYSTEM, EXTERNAL CHECK HINGES, W/ STAINLESS STEEL HINGE POSTS, WHITE COLOR. SUPPLY STOP: "BRASS CRAFT" MODEL SR-3712.	WHERE USED FOR ADA ACCESSIBLE WATER CLOSETS, THE FLUSH TRIP LEVER SHALL BE MOUNTED ON THE WIDE SIDE OF THE WATER CLOSET ENCLOSURE. MOUNT AT HEIGHT INDICATED ON ARCHITECTURAL DRAWINGS. DO NOT EXCEED 19" FROM FINISHED FLOOR TO TOP OF SEAT.	2"	4"	4"	3/4"	1/2"	–	–
♿	L-1	LAVATORY COUNTER MOUNTED	"AMERICAN STANDARD" AQUALYN MODEL 0476.028 COUNTERTOP SINK OR EQUAL, VITREOUS CHINA, SELF RIMMING, 20"x17-3/8", AVAILABLE IN THREE FAUCET HOLE	"AMERICAN STANDARD" COLONY PRO MODEL 7075.054 THREE HOLE BATHROOM FAUCET OR EQUAL, 0.5 GPM SINGLE OR THREE HOLE MOUNT, STAINLESS STEEL BODY WITH 1/4" THREADED STUD MOUNTINGS	LAVATORY POP UP DRAIN, WITH 1-1/4" OFFSET TAILPIECE, INTEGRAL DRAIN ASSEMBLY OR EQUAL, CHROME FINISH, MOUNT P-TRAP BELOW SINK WITH INSULATION ON TRAP WASTE AND WATER PIPING FOR HANDICAP	COORDINATE WITH ARCH DWGS	1-1/2"	2"	1-1/2"	3/4"	1/2"	3/4"	1/2"
♿	SH-1	SHOWER FLOOR MOUNTED	"BRADLEY" MODEL WS-1X-HN INDIVIDUAL PIVOTING BARRIER FREE WALL SHOWER PANEL WITH HINGES, STAINLESS STEEL, WALL MOUNTED	STANDARD 6' SHOWER HEAD HEIGHT, THERMOSTATIC MIXING VALVE, AXIS SHOWERHEAD WITH BALL JOINT, HAND SHOWER WAND WITH FLEX HOSE, 1.5 GPM HEAD, 1.75 GPM MAX	PROVIDE COMPATIBLE FLOOR DRAIN FITTING AND DRAIN OPERATION WITH LISTED PRODUCT WITH COORD FOR BUILT IN FLOOR TILE FOR FLOOR DRAIN	CAREFULLY COORDINATE ARCH PROVISIONS OF WALL TILE AND FLOOR TILE (SEE F3/A4.0) AND DIMENSIONS WITH FIXTURE SPECS PRIOR TO ORDERING	1-1/2"	2"	1-1/2"	3/4"	1/2"	3/4"	1/2"
♿	S-1	BREAK ROOM COUNTER MOUNTED	"ELKAY" MODEL LRADQ2022265PD OR EQUAL, 19" x 22" x 6" SINGLE BOWL, TYPE 304 STAINLES STEEL WITH SATIN FINISH, DROP-IN INSTALLATION REAR CENTER DRAIN PLACEMENT, OVERALL SIZE 19x22x8", 16x16x6 BOWL	"T&S" MODEL B-2866-05-LF15 DECK MOUNTED MIXING FAUCET OR EQUAL W/ 4" WRISTBLADE HANDLES, SWIVEL GOOSENECK SPOUT ABOVE BOWL, ROSESPRAY OUTLET, 1.5 GPM AERATOR	BASKET DRAINS, STAINLESS STEEL PERFORATED 1-1/2" STRAINER GRID OR EQUAL. PROVIDE "IN SINK ERATOR" MODEL 5XP DISPOSER, 3/4 HP, 120V/1Ph/60 Hz, PROVIDE CAP ON DISHWASHER CONN.	PROVIDE "BRADLEY" MODEL S59-4016 OR EQUAL THERMOSTATIC MIXING VALVE, SET TEMPERATURE AT 120°F (ADJUSTABLE). MOUNT PER MANUFACTURER'S DIRECTIONS. PROVIDE "IN SINK ERATOR" MODEL 5XP DISPOSER, 3/4 HP, 120 V./ 1 Ph./ 60 Hz, PROVIDE CAP FOR DISHWASHER DRAIN CONN.	1-1/2"	2"	2"	3/4"	1/2"	3/4"	1/2"
	S-2	LABS PESTICIDE/ METROLOGY COUNTER MOUNTED	"DAYTON" MODEL DSE12522 OR EQUAL, 25" x 22" x 8-1/16" SINGLE BOWL, TYPE 304 STAINLES STEEL WITH SATIN FINISH, DROP-IN INSTALLATION REAR CENTER DRAIN PLACEMENT, PROVIDE HOLE FOR OPTIONAL SPRAY HOSE AND HOLE PLATE	"T&S" MODEL B-2866-05-LF15 DECK MOUNTED MIXING FAUCET OR EQUAL W/ 4" WRISTBLADE HANDLES, SWIVEL GOOSENECK SPOUT ABOVE BOWL, ROSESPRAY OUTLET, 1.5 GPM AERATOR	BASKET DRAINS, STAINLESS STEEL PERFORATED 1-1/2" STRAINER GRID OR EQUAL. PROVIDE "IN SINK ERATOR" MODEL 5XP DISPOSER, 3/4 HP, 120V/1Ph/60 Hz, PROVIDE CAP ON DISHWASHER CONN. FIELD COORD WITH OWNER GARBAGE DISOPOSER.	PROVIDE "BRADLEY" MODEL S59-4016 OR EQUAL THERMOSTATIC MIXING VALVE, SET TEMPERATURE AT 120°F (ADJUSTABLE). MOUNT PER MANUFACTURER'S DIRECTIONS.	1-1/2"	2"	2"	3/4"	1/2"	3/4"	1/2"
	S-3	BELL PROVER LAB COUNTER ASSEMBLY WITH INTEGRAL SPECIALTY SINK	"ELKAY" SPECIALTY COUNTER/SINK ASSEMBLY OR EQUAL, 22"Wx16"Lx 24"DEEP SINGLE BOWL, TYPE 304 STAINLES STEEL WITH SATIN FINISH, CENTER DRAIN PLACEMENT, OVERALL 72"Lx26" FRONT TO BACKx36" HIGH COUNTER, SPECIAL ORDER FROM FACTORY REQUIRED, 16 GA. SS	"T&S" MODEL B-2866-05-LF15 DECK MOUNTED MIXING FAUCET OR EQUAL W/ 4" WRISTBLADE HANDLES, SWIVEL GOOSENECK SPOUT ABOVE BOWL, ROSESPRAY OUTLET, 1.5 GPM AERATOR, PROVIDE SECONDARY SPRAY HOSE AT DECK FOR METER CLEANING	BASKET DRAINS, STAINLESS STEEL PERFORATED 1-1/2" STRAINER GRID OR EQUAL. PROVIDE "IN SINK ERATOR" MODEL 5XP DISPOSER, 3/4 HP, 120V/1Ph/60 Hz, PROVIDE CAP ON DISHWASHER CONN. FIELD COORD WITH OWNER GARBAGE DISOPOSER.	PROVIDE "BRADLEY" MODEL S59-4016 OR EQUAL THERMOSTATIC MIXING VALVE, SET TEMPERATURE AT 120°F (ADJUSTABLE). MOUNT COUNTER/SINK ASSEMBLY PER MANUFACTURER'S DIRECTIONS. PROVIDE CONSTRUCTION SUBMITTAL FOR REVIEW	1-1/2"	2"	2"	3/4"	1/2"	3/4"	1/2"
	S-4	MAINTENANCE SHOP COUNTER MOUNTED	"ELKAY" MODEL SSR1242 OR EQUAL, 24" x 24" x 14" SINGLE BOWL, TYPE 304 STAINLES STEEL WITH SATIN FINISH, FREE STANDING REAR CENTER DRAIN PLACEMENT, OVERALL 27x27x44 SIZE	"T&S" MODEL S-0231 WALL MOUNTED OR EQUAL FAUCET W/ 4" SS LEVER HANDLES, SWIVEL CURVED SPOUT ABOVE BOWL, ROSESPRAY OUTLET, 1.5 GPM AERATOR	BASKET DRAINS, STAINLESS STEEL PERFORATED 1-1/2" STRAINER GRID OR EQUAL. PROVIDE "IN SINK ERATOR" MODEL 5XP DISPOSER, 3/4 HP, 120V/1Ph/60 Hz, PROVIDE CAP ON DISHWASHER CONN. FIELD COORD WITH OWNER GARBAGE DISOPOSER.	PROVIDE "BRADLEY" MODEL S59-4016 OR EQUAL THERMOSTATIC MIXING VALVE, SET TEMPERATURE AT 120°F (ADJUSTABLE). MOUNT PER MANUFACTURER'S DIRECTIONS.	1-1/2"	2"	2"	3/4"	1/2"	3/4"	1/2"
	SS-1	SERVICE SINK FLOOR MOUNTED	"AMERICAN STANDARD" FLORWELL OR EQUAL, SERVICE SINK w/ VINYL RIM GUARD, FLOOR MOUNTED.	"AMERICAN STANDARD" MODEL 8344.012 OR EQUAL, EXPOSED YOKE, WALL MOUNTED UTILITY FAUCET, w/ TOP BRACE, VACUUM BREAKER, METAL LEVER HANDLES, 6" THREADED SPOUT & 1/2" NPT FEMALE INLETS WITH INTEGRAL VALVE STOPS.	PROVIDE STRAINER.	PROVIDE SUITABLE BLOCKING FOR TOP BRACE AS PART OF ROUGH-IN.	2"	3"	3"	3/4"	3/4"	3/4"	3/4"
	2" FD	FLOOR DRAIN	"ZURN" MODEL Z-508 ADJUSTABLE FLOOR DRAIN OR EQUAL, DURA-COATED CAST IRON BODY, W/ GAS & WATERTIGHT BRONZE TAPERED THREAD PLUG, AND ROUND TOP ADJUSTABLE TO FINISHED FLOOR.		PROVIDE ANCHOR FLANGE, SEEPAGE PAN, CLAMPING COLLAR AND WATERTIGHT JOINT AT FLOOR, PROVIDE POLISHED NICKEL BRONZE SQUARE STRAINER, PROVIDE W/ TRAP & VENT	PROVIDE VENT CONN & TRAP PRIMER CONN BELOW FLOOR AT TRAP OF FLOOR DRAIN. COORDINATE WITH ARCH TILE FLOOR FINISH IF ANY	1-1/2"	2" 3" 4"	2" 3" 4"	–	–	–	–
	FS	FLOOR SINK	"ZURN" 12"x12"x8" MODEL Z-1901-KC-2-25 FLOOR SINK, CAST IRON, A.R.E. INTERIOR FINISH OR EQUAL PRODUCT		PROVIDE ANCHOR FLANGE, SEEPAGE PAN, CLAMPING COLLAR AND WATERTIGHT JOINT AT FLOOR, PROVIDE WHITE A.R.C. SEDIMENT BUCKET WITH ANTI SPLASH. PROVIDE 1/2 GRATE. PROVIDE W/ TRAP & VENT	MATCH (N) FLOOR SINK TO FLOOR SLOPE AND FINISH, PROVIDE HALF GRATED COVER AT POINT DRAIN PIPES DO NOT ENTER, LOCATE FLOOR SINK NEAR FIRE RISER DRAIN OUT OF TRAFFIC AREA, SEE PLAN NOTES, IF LOCATED IN TRAFFIC AREA PROVIDE FULL GRATED COVER	1-1/2"	2" 3" 4"	2" 3" 4"	–	–	–	–
	FCO	FLOOR CLEANOUT	"ZURN" MODEL Z-1400 ADJUSTABLE FLOOR CLEANOUT OR EQUAL, DURA-COATED CAST IRON BODY, W/ GAS & WATERTIGHT BRONZE TAPERED THREAD PLUG, AND ROUND TOP ADJUSTABLE TO FINISHED FLOOR.			COORDINATE WITH ARCH TILE FLOOR FINISH IF ANY	–	2" 3" 4"	2" 3" 4"	–	–	–	–
	WCO	WALL CLEANOUT	"ZURN" MODEL Z-1446 CLEANOUT TEE OR EQUAL, DURA-COATED CAST IRON BODY W/ GAS & WATERTIGHT BRONZE TAPERED THREAD PLUG, AND ROUND STAINLESS STEEL WALL ACCESS	"ZURN" MODEL Z-1400-BZ1 WITH CONCRETE POUR OR Z-1400-BZ1-DP POST POUR			–	2" 3" 4"	2" 3" 4"	–	–	–	–
	GCO	GRADE CLEANOUT	"ZURN" MODEL Z-1402 OR EQUAL NON-ADJUSTABLE FLOOR CLEANOUT, DURA-COATED CAST IRON BODY, W/ GAS & WATERTIGHT BRONZE TAPERED THREAD PLUG, AND ROUND TOP.			COORDINATE WITH ARCH AREA FINISH IF ANY	–	2" 3" 4"	2" 3" 4"	–	–	–	–
	WHA	WATER HAMMER ARRESTOR	"PPP" COPPER TUBE WITH PISTON TYPE ARRESTOR OR EQUAL			PROVIDE SS WALL BOX WTH LOCKING ACCESS DOOR	–	–	–	–	–	–	–
	TP	TRAP PRIMER	"PPP" OR EQUAL DUAL FLOW TRAP PRIMER VALVE, MODEL CPO-500	PROVIDE BALL VALVE AT EACH TP LOCATION.	MOUNT TRAP PRIMER IN SHEET METAL BOX WITH "KARP" OR EQUAL ACCESS DOOR. COORDINATE WITH ARCH ELEVATIONS FOR BOX LOCATION.	INSTALL PER MANUFACTURER'S INSTRUCTIONS. PROVIDE DISTRIBUTION UNIT WITH FEEDER PIPING FOR TRAP. RECESS WALL MOUNT AND PROVIDE ACCESS DOOR.	–	–	–	1/2"	1/4"	–	–
	IMB	ICE MAKER WATER BOX	"WATER-TIGHT" OR EQUAL MODEL 87979 WALL BOX FOR ICE MAKER WITH INTEGRAL VALVE AND WATER HAMMER ARRESTOR WIT CW PIPE CONNECTION	PROVIDE SHUT OFF VALVE AT EACH BOX LOCATION.		LOCATE NEAR REFRIGERATOR, FIELD COORDINATE LOCATION AND SEE ARCH DWGS INSTALL PER MANUFACTURER'S INSTRUCTIONS WITH ACCESS DOOR.	–	–	–	1/2"	1/2"	–	–
	HB	HOSE BIBB	"J.R. SMITH" MODEL 5509 EXTERIOR WALL MOUNT NON-FREEZE.		WITH INTEGRAL VACUUM BREAKER	PROVIDE RECESSED 16 GA. STAINLESS STEEL HINGED BOX WITH FULL 180° HINGED LOCKING COVER, CONCEALED HOSE CONNECTION.	–	–	–	3/4"	3/4"	–	–
	6" TD	TRENCH DRAIN	"ZURN" SANI FLOW ZS890 LINEAR TRENCH DRAIN 6" WIDE, 7" DEEP, FS WALKING GRATE LOCKS TO FRAME, TYPE 304 STAINLESS STEEL			COORDINATE INSTALLATION WITH FLOOR SLOPE AND ARCH FINISH OF CONCRETE FLOOR, SEE A2.1. COORDINATE INSTALLATION WITH WATER METER TEST BENCH ASSEMBLY WHICH WILL BE INSTALLED BY OWNER							
	IM	ICE MAKER	"SCOTSMAN CU0715 SELF-CONTAINED ICE MACHINE. UNDER COUNTER CUBER WITH 36LB ICE STORAGE, PRODUCSUP TO 80LB PER DAY, 1/4 CW CONNECTION AND 3/4" DRAIN, 115 V, 60 HZ, SINGLE PHASE. 38" TALL, 14" WIDE, 19" DEEP	PROVIDE SHUT OFF VALVE AT WALL BOX		PROVIDE RECESSED WALL BOX WITH SHUT OFF VALVE FOR ICE MAKER PIPE CONDENSATE DRAIN AND WATER DRAIN FROM ICE MAKER TO FLOOR SINK WITH AIR GAP FITTINGS AND DOWN TURN ELBOWS ABOVE FS	–	–	–	1/2"	1/4"	–	–
	EW	EYE WASH	"HAWS" MODEL 7360BTWC EYE WASH, ADA COMPLIENT, PRE/BUILT, WALL MOUNTED, BARRIER FREE, 11" STAINLESS STEEL BOWL. 3.7 GPM			COORDINATE WITH ARCH DWGS	1-1/2"	1-1/4"	1-1/4"	1/2"	1/4"	–	–

SCHEDULE NOTES:

1. PROVIDE MANUFACTURER'S CUT SHEETS, MANUFACTURER'S INSTALLATION INSTRUCTIONS AND MANUFACTURER'S ROUGH-IN INSTRUCTIONS FOR EACH PLUMBING FIXTURE, VALVE OR FAUCET AND TRIM AS A SUBMITTAL FOR REVIEW BY ARCHITECT AND ENGINEER. AFTER FIXTURE SUBMITTAL IS STAMPED "NO EXCEPTIONS NOTED" THE CUT SHEETS, INSTALLATION INSTRUCTIONS AND ROUGH-IN INSTRUCTIONS SHALL BE PROVIDED BY THE CONTRACTOR TO THE INSPECTOR AS 8-1/2x11 PAPER COPIES FOR INSPECTION DURING CONSTRUCTION.
2. IF EQUAL PRODUCT IS SUBMITTED PROVIDE WRITTEN DOCUMENTATION TO DEMONSTRATE FITNESS OF SUBSTITUTION AS AN EQUAL PRODUCT TO THAT SPECIFIED.
3. IF CURRENT PRODUCTS FOR THE MANUFACTURER HAVE BEEN MODIFIED FROM WHAT IS SCHEDULED NOTE THE CHANGES IN THE FIXTURE SUBMITTAL.
4. CAREFULLY COORDINATE FIXTURE INSTALLATION AND PLUMBING PIPING WORK WITH ARCHITECTURAL DRAWINGS.

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CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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DATE	12/11/2023
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SHEET	P0.2
	PLUMBING SCHEDULES
OF	SHEETS

PLUMBING EQUIPMENT

EWH 1

ELECTRIC WATER HEATER:
"STATE" MODEL CSB 52 9 SFE, OR EQUAL, 50-GAL STORAGE CAPACITY, 9 kW HEATING ELEMENTS, 53 GPH AT 70°F TEMPERATURE RISE, 208V/3ø/60Hz, 9kW, 1-1/4" H&CW, 3/4" T&P RELIEF, 3/4" DRAIN VALVE, 55-3/4"H x 21-3/4"ø, WEIGHT (FULL): 700 LBS.

CP 1

HOT WATER CIRCULATION PUMP:
"B&C" MODEL NBF-18S OR EQUAL, LEAD-FREE, BRONZE, WET ROTOR CIRCULATION PUMP, HARD WIRED 2 GPM AT 15 FT HD, 3000 RPM, MAXIMUM WORKING PRESSURE= 150 PSIG, MAXIMUM OPERATING TEMPERATURE= 225°F, PROVIDE MODEL AQS-3/4 AQUASTAT TO TURN PUMP ON AT 90°F (ADJUSTABLE) & TURN PUMP OFF AT 115°F (ADJUSTABLE), UNION CONNECTIONS. SEE 2/P501 FOR INSTALLATION OF IN-LINE PUMP IN PIPING WITH WATER HEATER.

DIMENSIONS: 5" L x 5" W x 5" H
ELECTRICAL INFORMATION: 120V, 1 Ph, 60 Hz, 90 WATTS,
OPERATING WEIGHT: 11 LBS

COMP 1

RELOCATED SIMPLEX AIR COMPRESSOR:
(E) "INGERSOLL RAND" MODEL TS4N5 SIMPLEX AIR COMPRESSOR, 80 GALLONS, RATED AT 15.8 SCFM AT 90 PSIG, MAX RATED PRESSURE 175 PSIG, 1375 RPM, 5 HP, 230V/1Ph/60Hz, OWNER PROVIDED, ANCHOR TO CONCRETE PAD OUTDOORS. SEE 6/P5.1 FOR MOUNTING.

OPERATING WEIGHT: EXISTING

2019 CPC APPENDIX A DOMESTIC WATER PIPE SIZING TABLE

SIZE	MAX FIXT UNITS	MAX FRICTION	EQUIVALENT GPM	HW INSUL	NOTES
3/4"	4 FU	3.8	4	1" THICK	SEE ALSO FIXTURE SCHEDULE ON P0.2 FOR MIN BRANCH LINE SIZE TO INDIVIDUAL FIXTURES.
1"	11 FU	3.8	9	1" THICK	SEE ALSO FIXTURE SCHEDULE ON P0.2 FOR MIN BRANCH LINE SIZE TO INDIVIDUAL FIXTURES.
1-1/4"	21 FU	3.8	15	1.5" THICK	SEE ALSO FIXTURE SCHEDULE ON P0.2 FOR MIN BRANCH LINE SIZE TO INDIVIDUAL FIXTURES.
1-1/2"	40 FU	3.8	25	1.5" THICK	SEE ALSO FIXTURE SCHEDULE ON P0.2 FOR MIN BRANCH LINE SIZE TO INDIVIDUAL FIXTURES.
2"	124 FU	3.8	50	2" THICK	SEE ALSO FIXTURE SCHEDULE ON P0.2 FOR MIN BRANCH LINE SIZE TO INDIVIDUAL FIXTURES.
2-1/2"	407 FU	3.8	110	2" THICK	SEE ALSO FIXTURE SCHEDULE ON P0.2 FOR MIN BRANCH LINE SIZE TO INDIVIDUAL FIXTURES.
3"	779 FU	3.8	180	2" THICK	SEE ALSO FIXTURE SCHEDULE ON P0.2 FOR MIN BRANCH LINE SIZE TO INDIVIDUAL FIXTURES.

NOTES:
1. WATER PIPE SIZING FOR THIS TABLE IS BASED ON CHART A 105.1(5) FOR PLASTIC DOMESTIC WATER PIPING. SEE CHART A 105.1(1) FOR COPPER PIPING.
2. MAXIMUM WATER PRESSURE DROP FOR PIPING SIZE IS LIMITED TO 3.5 PSIG/100 FEET OF PIPE PER APPENDIX A WATER SIZING CALCULATION BELOW.
3. EQUIVALENT GPM FOR FIXTURE UNITS FOR EACH BRANCH LINE IS FOR FLUSH TANKS BASED ON 2019 CPC CHART A 103.1 (2) AND CHART A 103.1 (2) FOR USE ON CHART A 105.1(1) FOR COPPER PIPING AND 105.1 (5) FOR PLASTIC PIPING (FIELD COORDINATE WITH OWNER TO VERIFY PLASTIC ALLOWED).
4. INSULATION FOR HW PIPING IS SHOWN FOR PIPING WITHIN BUILDING INSULATION ENVELOPE ONLY. SEE NOTE 14 ON P0.1 FOR OTHER DOMESTIC WATER PIPE INSULATION REQUIREMENTS.
5. IF PIPE SIZED ON PLANS RETAIN SIZE SHOWN ON PLANS.

TABLE NOTES

1. TOTAL DEVELOPED LENGTH OF PIPING FROM SERVICE CONNECTION AT STREET TO MOST REMOTE DEMAND (N) FIXTURE WCH IS HOSE BIBB = 250 FEET. MOST REMOTE (N) FIXTURES APPROX 250 FEET FOR THIS PROJECT.
2. ALLOW 30% OF TOTAL DEVELOPED LENGTH FOR FRICTION LOSS IN VALVES & FITTINGS. TOTAL EQUIVALENT PIPE LENGTH = 250.0 FEET * 1.30 = 325 FEET FARTHEST (N) FIXTURE
3. SYSTEM CRITERIA PER 2019 CPC – SECTION A 104.4:
   (FRICTION LOSS.)/(TOT.EQUIV.LENGTH) * 100 = 11.0 PSIG / 325 FT = 3.5 PSIG/100 FEET
   (FRIC LOSS.)/(TOT.EQUIV.LENGTH) * 100 = 3.5 PSIG x 2.31 FT HD/PSIG= 8.1 FT HD/100 FEET
4. SIZING PER 2019 CPC APPENDIX A:
   THIS PROJECT (N) FU = 63.5 DOMESTIC CW FIXTURE UNITS TOTAL (35 GPM) AND 5 GPM FOR WATER METER TEST BENCH FOR 2" SUPPLY TO BLDG REQUIRED. COMBINED FIXTURES AND WATER METER TEST BENCH APPARATUS = 40 GPM.

DOMESTIC WATER SIZING CALCULATION APPENDIX A

A.	MINIMUM STATIC WATER PRESSURE AVAILABLE:	40 PSIG
B.	WATER DEMAND:	10 PSIG
C.	WATER METER: (E) 2" METER SET	7 PSIG
D.	PRESSURE REDUCING VALVE AT (N) BACKFLOW PREVENTOR:	5 PSIG
E.	(N) STREET SERVICE, (N) SITE SUPPLY, 250 FT TO FIXT	63.5 FU PER APP A CALC + TEST METER TEST BENCH
F.	APPENDIX A PIPE SIZING CRITERIA: 40 GPM FOR 2" PIPE	3.5 PSIG PER 100 FT. PIPE

AVAILABLE WATER PRESSURE (SUMMER RESIDUAL WORST CASE)	40 PSIG
PRESSURE LOSS PRESSURE REDUCING VALVE AT (E) BACKFLOW PREVENTOR:	5 PSIG
PRESSURE LOSS DUE TO HEIGHT (15 FT / 2.31 PSI/FT)	6.5 PSIG
FRICTION LOSS REMOTE OUTLET (TOTAL DEVELOPED LENGTH = 250x1.3=325 FT)	11 PSIG
NET PRESSURE AVAILABLE BASED ON 40 PSIG STATIC (40-7-5-11-10=7)	7 PSIG
PRESSURE REQUIRED AT MOST REMOTE DEMAND FIXTURE	10 PSIG
MINIMUM TOTAL PRESSURE REQUIRED (7+5+11+6.5+10=39.5)	39.5 PSIG
MINIMUM BOOST PRESSURE REQUIRED = NOT REQUIRED	NA

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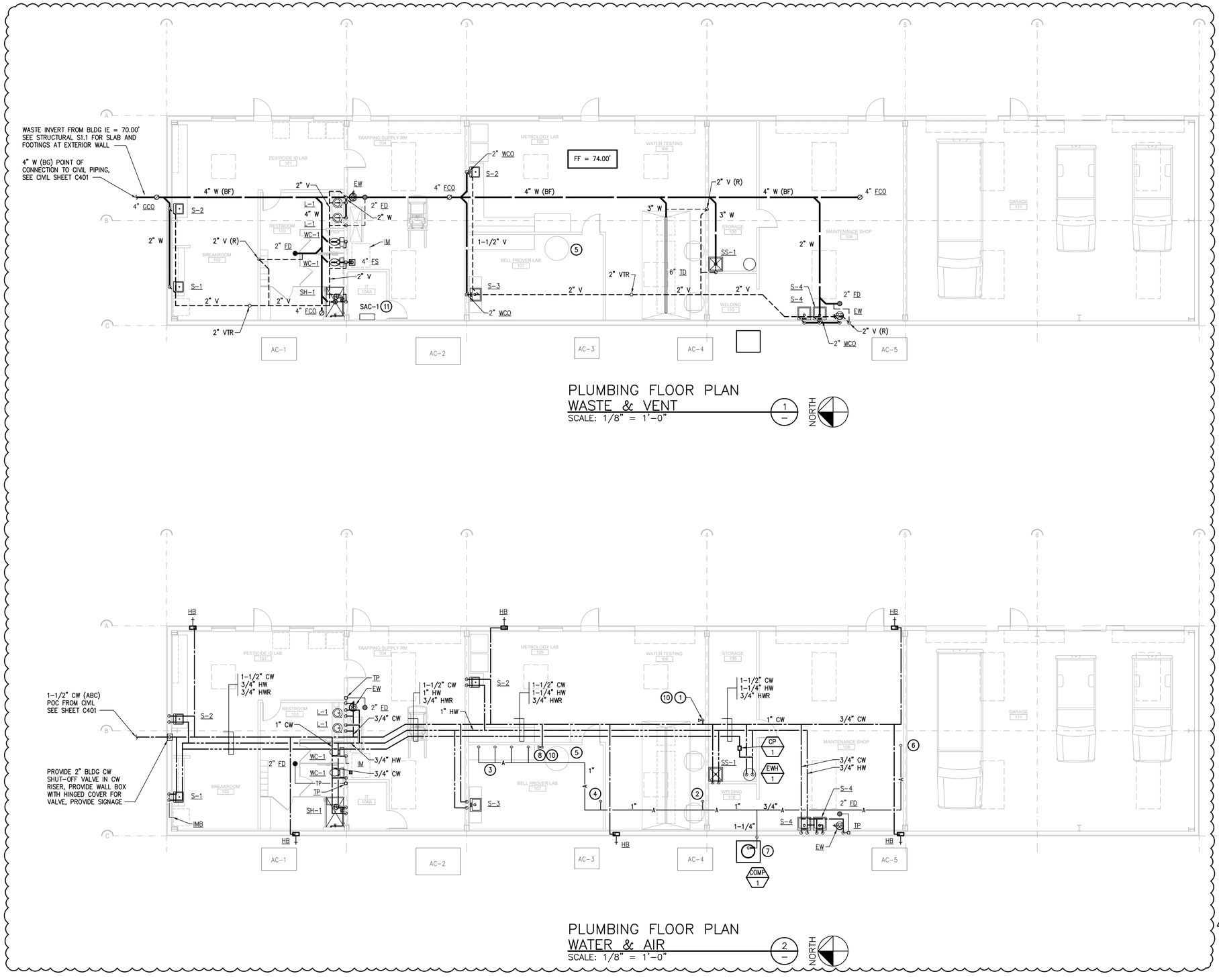
	PLUMBING SCHEDULES
OF	SHEETS



PLUMBING FLOOR PLAN
WASTE & VENT
SCALE: 1/8" = 1'-0"

1 — NORTH

PLUMBING FLOOR PLAN
WATER & AIR
SCALE: 1/8" = 1'-0"

2 — NORTH

PLAN SHEET NOTES

1. PROVIDE 1-1/2" CW LINE AT WATER TEST BENCH ASSEMBLY FOR DOMESTIC COLD WATER SUPPLY. FIELD COORDINATE DROP AT WALL TO FLOOR FOR CONNECTION TO WATER TEST BENCH ASSEMBLY WITH OWNER WHO WILL ASSEMBLE AND INSTALL THE WATER TEST BENCH ASSEMBLY. THE OWNER PROVIDED AND INSTALLED WATER TEST BENCH INCLUDES ONE 1-1/2 HP WATER PUMP NEAR THE RELOCATED WATER STORAGE TANK AND ONE 1/2 HP WATER PUMP AT THE OPPOSITE END OF THE TEST BENCH. PIPING AND PIPE CONNECTIONS TO THE RELOCATED WATER PUMPS FOR WATER METER TEST BENCH ASSEMBLY BY OWNER. PROVIDE CW SHUT OFF VALVE AT 1-1/2" CW DROP AT WALL. PROVIDE SCREWED FITTING FOR CONNECTION TO ASSEMBLY, FIELD COORDINATE FITTING TYPE WITH USER.
2. PROVIDE 1" COMPRESSED AIR LINE AT WATER TEST BENCH ASSEMBLY FOR COMPRESSED AIR SUPPLY. FIELD COORDINATE DROP AT WALL TO FLOOR FOR CONNECTION TO WATER TEST BENCH ASSEMBLY WITH OWNER WHO WILL ASSEMBLE AND INSTALL THE WATER TEST BENCH ASSEMBLY. COMPRESSED AIR LINE TO PROVIDE MIN 2 SCFM COMPRESSED AIR.
3. PROVIDE FOUR 1 SCFM AIR OUTLETS AT WORK BENCH IN BELL PROVER LAB. PROVIDE 1/2" DROP AT WALL TO EACH COMPRESSED AIR OUTLET. FIELD COORDINATE OUTLET CONNECTION TYPE WITH USER.
4. PROVIDE 1" COMPRESSED AIR LINE AT BELL PROVER ASSEMBLY FOR COMPRESSED AIR SUPPLY. FIELD COORDINATE DROP AT WALL TO FLOOR FOR CONNECTION TO BELL PROVER ASSEMBLY WITH OWNER WHO WILL ASSEMBLE AND INSTALL THE BELL PROVER ASSEMBLY. COMPRESSED AIR LINE TO PROVIDE MIN 2 SCFM COMPRESSED AIR.
5. THE BELL PROVER ASSEMBLY WILL BE PROVIDED AND INSTALLED BY THE OWNER. ONE 1/2 HP PUMP AT 115 V WILL BE INCLUDED IN THE OWNER PROVIDED BELL ASSEMBLY RELOCATED FROM THE PREVIOUS LAB.
6. PROVIDE ONE 1 SCFM AIR OUTLET AT WALL OF MAINTENANCE SHOP. PROVIDE 1/2" DROP AT WALL TO EACH COMPRESSED AIR OUTLET. FIELD COORDINATE OUTLET CONNECTION TYPE WITH USER.
7. ANCHOR OWNER PROVIDED AIR COMPRESSOR TO CONCRETE PAD WITH "HILTI" KWIK BOLT TZ SS 1/2"ø CONCRETE ANCHOR BOLTS WITH MINIMUM 2" EMBEDMENT AT EACH COMPRESSOR LEG FACTORY ANGLE.
8. PROVIDE 1-1/2" CW LINE AT BELL PROVER ASSEMBLY FOR DOMESTIC COLD WATER SUPPLY. FIELD COORDINATE CW DROP AT WALL TO FLOOR FOR CONNECTION TO BELL PROVER ASSEMBLY WITH OWNER WHO WILL ASSEMBLE AND INSTALL THE BELL PROVER ASSEMBLY. PROVIDE CW SHUT OFF VALVE AT 1-1/2" CW DROP AT WALL. PROVIDE SCREWED FITTING FOR CONNECTION TO ASSEMBLY, FIELD COORDINATE FITTING TYPE WITH USER.

△3

9. NOT USED.
10. PROVIDE BACK-FLOW PREVENTER AT DOMESTIC WATER DROP AT LAB WATER SYSTEM TO PREVENT CONTAMINATION OF DOMESTIC COLD WATER SYSTEM FROM PRESSURIZED LAB WATER PIPING.
11. ROUTE 3/4" CONDENSATE FROM AC UNIT DOWN WALL AND TERMINATE 12" AFG WITH DOWNTURNED EL. SPILL TO GRADE.

△3

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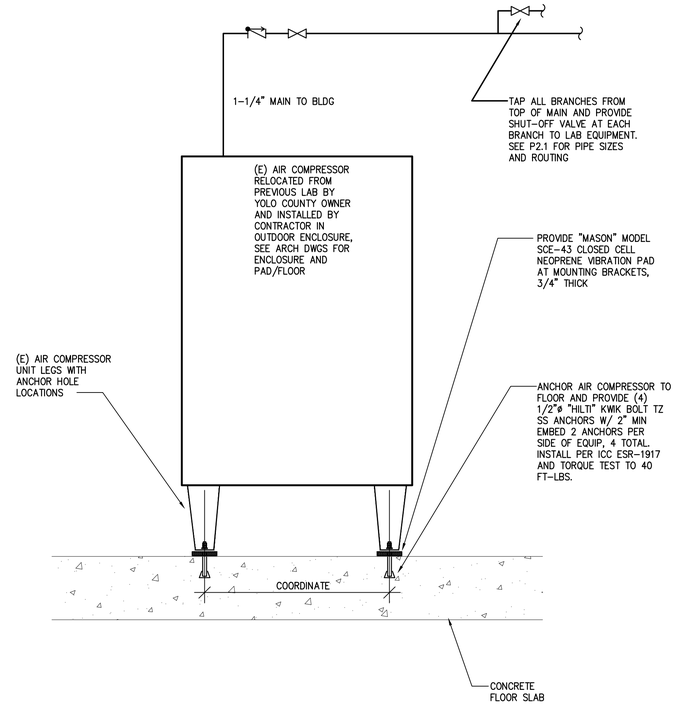
SHEET	P2.1
	PLUMBING FLOOR PLAN
OF	SHEETS

NOTE:
PROVIDE SHUT OFF VALVES, CHECK VALVE, FILTER DRIP AND TRAP AND AIR DRYER WITH UNIONS AND GAUGES. COORDINATE WITH OWNER FOR ITEMS TO BE RELOCATED FROM PREVIOUS LAB, FOR BIDDING ASSUME ALL NEW PIPING AND PIPING APPURTENANCES.



AIR COMPRESSOR SYSTEM MOUNTING

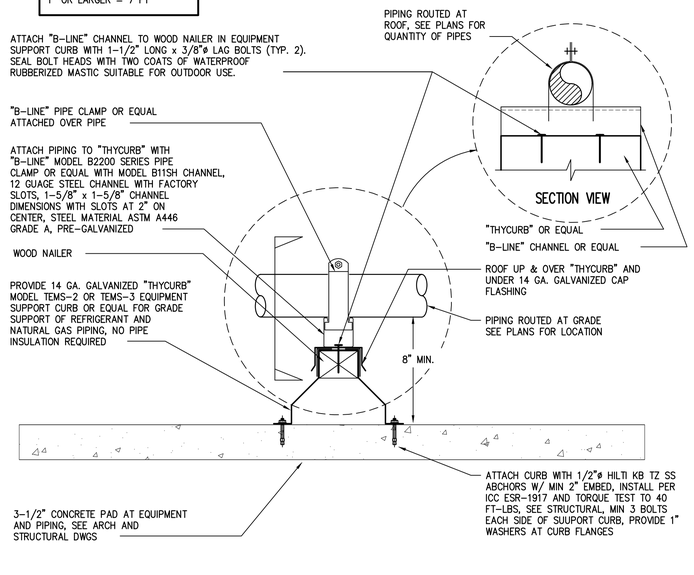
SCALE: NONE

6 P5.1

MAX SPACING OF SUPPORTS FOR SCHED 40 STL PIPING:

MAX SPACING OF SUPPORTS FOR COPPER PIPING:

3/4" OR SMALLER = 4 FT
1" OR LARGER = 7 FT



RIGID PIPE SUPPORT AT CONCRETE

SCALE: NONE

5 P5.1

MAX SPACING OF SUPPORTS FOR COPPER TYPE L WATER PIPING & CONDENSATE PIPING & BLACK STEEL GAS PIPING:

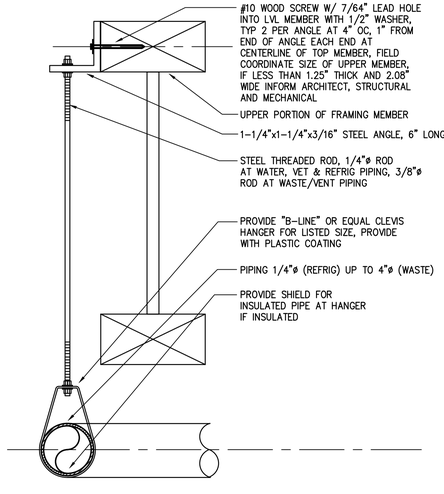
5/8" OR SMALLER = 3 FT
3/4" TO 1-1/2" = 5 FT
2" OR LARGER = 8 FT

MAX SPACING OF SUPPORTS FOR PLASTIC WASTE & VENT PIPING:

1-1/2" OR SMALLER = 3 FT
2" OR LARGER = 6 FT

MAX SPACING OF SUPPORTS FOR CAST IRON WASTE & VENT PIPING:

EVERY OTHER JOINT UNLESS GREATER THAN 4'-0", THE SUPPORT EACH JOINT. SEE ALSO NOTES ON P0.1.



PIPE SUPPORT AT METAL BLDG FRAMING

SCALE: NONE

4 P5.1

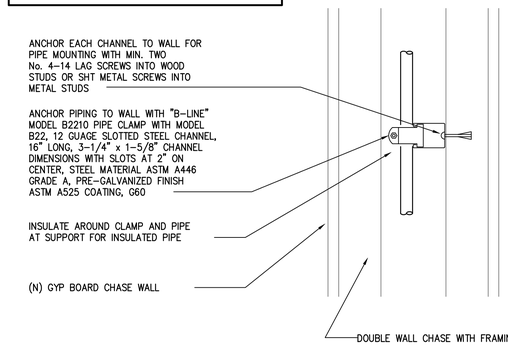
NOTE:
MOUNTING APPLIES TO EITHER VERTICAL OR HORIZONTAL MOUNTED PIPES AT DOUBLE CHASE WALL, AND APPLIES TO WASTE, VENT OR CONDENSATE PIPE AND CW PIPE AND HW PIPE AND HWR PIPE

MAX SPACING OF SUPPORTS FOR COPPER PIPING:

1-1/2" OR SMALLER = 4 FT
2" OR LARGER = 8 FT

MAX SPACING OF SUPPORTS FOR SCHED 40 STEEL PIPING OR WASTE & VENT PIPING:

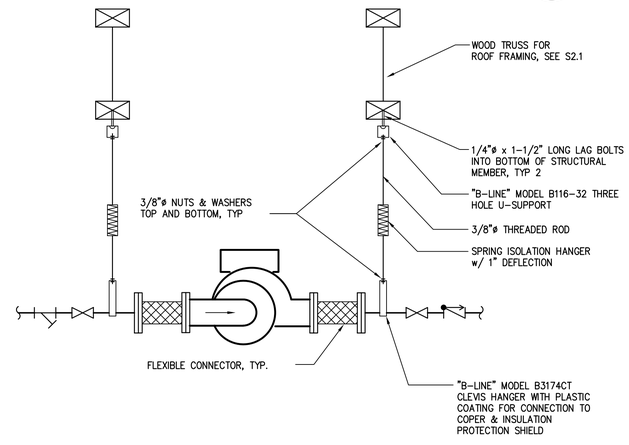
1-1/2" OR SMALLER = 6 FT
2" OR LARGER = 8 FT



PLUMBING PIPE CHASE WALL MOUNTING

SCALE: NONE

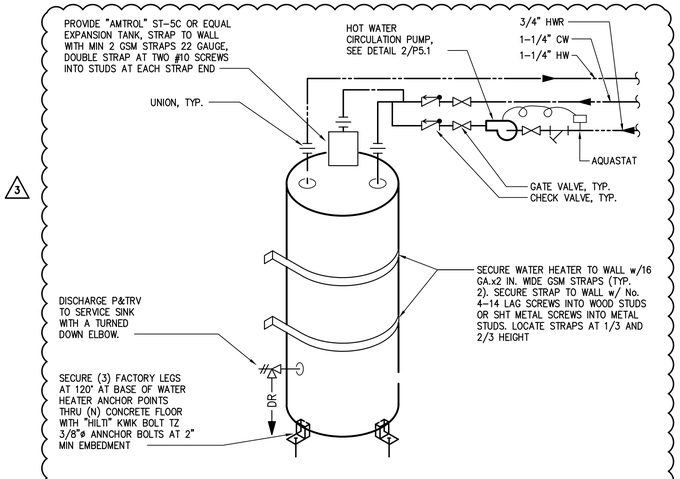
3 P5.1



IN-LINE PUMP MOUNTING

SCALE: NONE

2 P5.1



WATER HEATER

SCALE: NONE

1 P5.1

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SHEET P5.1
PLUMBING DETAILS
OF SHEETS

STANDARD ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	SUSPENDED LUMINAIRE.
	SURFACE MOUNTED LUMINAIRE.
	WALL MOUNTED LUMINAIRE.
	RECESSED MOUNTED LUMINAIRE.
	RECESSED MOUNTED DIRECT/INDIRECT LUMINAIRE.
	POLE LIGHT.
B	LUMINAIRE TAG, LETTER INDICATES TYPE, SEE LUMINAIRE SCHEDULE.
S	SINGLE POLE TOGGLE SWITCH, MOUNTED +42" ABOVE FINISHED FLOOR TO CENTER OF BOX.
D	DIGITAL DIMMER SWITCH, 0-10V DIMMING, WALL MOUNTED +42" ABOVE FINISHED FLOOR TO CENTER OF BOX.
OS	DIGITAL AUTOMATIC "ON/OFF", CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR.
PC	DIGITAL PHOTOSENSOR, 0-10V DIMMING, CLOSED LOOP, SINGLE ZONE, CEILING MOUNTED.
3	208V, 3 POLE MOTOR RATED TOGGLE DISCONNECT SWITCH.
X	NON FUSED DISCONNECT SWITCH. NUMBER ADJACENT INDICATES AMPERE RATING OF SWITCH.
X	FUSED DISCONNECT SWITCH WITH CLASS 'R' DUAL ELEMENT FUSES, SIZE TO SUIT EQUIPMENT NAME PLATE RATING. NUMBER ADJACENT INDICATES AMPERE RATING OF SWITCH.
X	THERMAL MAGNETIC CIRCUIT BREAKER DISCONNECT. NUMBER ADJACENT INDICATES AMPERE RATING OF SWITCH.
	CONTROL AND/OR EQUIPMENT, N.I.E.S., INSTALL AND CONNECT AS REQUIRED.
	MOTOR, N.I.E.S., CONNECT AS REQUIRED.
	EQUIPMENT DESIGNATION
	DISTRIBUTION PANEL/MOTOR CONTROL CENTER.
	GROUND BUS BAR.
	20 AMP 125V 3W DUPLEX CONVENIENCE RECEPTACLE, MOUNTED +18" ABOVE FINISHED FLOOR TO CENTER OF BOX.
	20 AMP 125V 3W DUPLEX CONVENIENCE RECEPTACLE, SPLIT WIRED, MOUNTED +18" ABOVE FINISHED FLOOR TO CENTER OF BOX. LOWER OUTLET CONTROLLED VIA RELAY.
	20 AMP 125V 3W DOUBLE DUPLEX CONVENIENCE RECEPTACLE, SPLIT WIRED, MOUNTED +18" ABOVE FINISHED FLOOR TO CENTER OF BOX. RIGHT SIDE OUTLETS CONTROLLED VIA RELAY.
	20 AMP 125V 3W DUPLEX CONVENIENCE RECEPTACLE, MOUNTED +18" ABOVE FINISHED FLOOR TO CENTER OF BOX WITH GROUND FAULT INTERRUPTER. LOWER OUTLET CONTROLLED VIA RELAY.
	20 AMP 125V 3W DOUBLE DUPLEX CONVENIENCE RECEPTACLE, MOUNTED +18" ABOVE FINISHED FLOOR TO CENTER OF BOX. (3)
	20 AMP 125V 3W DUPLEX CONVENIENCE RECEPTACLE, MOUNTED +18" ABOVE FINISHED FLOOR TO CENTER OF BOX WITH GROUND FAULT INTERRUPTER.
	JUNCTION BOX, SIZE AND TYPE AS INDICATED OR REQUIRED.
	TELEPHONE/DATA OUTLET, 4 11/16" SQUARE X 2 1/8" DEEP BOX WITH 1 DEVICE RING AND PLATE. MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF BOX. STUB 1.25"C 6" INTO ACCESSIBLE CEILING SPACE WITH A 18" RADIUS BEND. TERMINATE WITH INSULATING BUSHING.
WAP	OFCI WIRELESS ACCESS POINT.
N.I.E.S.	NOT IN ELECTRICAL SECTION OF THESE PLANS AND SPEC'S.
WP	WEATHERPROOF, DAMP OR WET LOCATION AS REQUIRED.
'G'	GREEN INSULATED GROUND WIRE, #12 AWG UNLESS NOTED.
AFF	ABOVE FINISHED FLOOR.
(E)	EXISTING.
(N)	NEW.
(D)	DEMOLISH.
XX	NUMBERED NOTE.
	RACEWAY INSTALLED IN CEILING OR WALL. ROUTE EXPOSED IN ALL UNFINISHED AREAS.
	RACEWAY INSTALLED BELOW FINISHED FLOOR OR GRADE.
	ARROW AT END OF RACEWAY INDICATES HOME RUN TO RESPECTIVE PANELBOARD OR SWITCHBOARD.
	OWNER FURNISHED SECURITY CAMERA
	INDICATES RACEWAY TURNING UP.
	INDICATES RACEWAY TURNING DOWN.
	INDICATES RACEWAY STUB. TERMINATE WITH BUSHING OR CAP IF UNDERGROUND.

STANDARD ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	BRANCH CIRCUIT WITHOUT FURTHER DESIGNATION INDICATES A 2 #12 AWG CIRCUIT WITH 1 #12 AWG GROUND.
	STRAIGHT CROSS-LINES IN BRANCH CIRCUIT RACEWAY INDICATE NUMBER OF #12 AWG WIRES IN A CIRCUIT. SHORT LINES INDICATE UNGROUNDED CONDUCTORS. LONG LINES INDICATE NEUTRAL CONDUCTORS. WIRES SHOWN ARE IN ADDITION TO 1 #12 AWG GROUNDING CONDUCTOR.
#10	BRANCH CIRCUIT WITH GROUNDING WIRE LARGER THAN #12 AWG. NUMBER ADJACENT TO CURVED CROSS-LINE INDICATES WIRE SIZE.
#10	BRANCH CIRCUIT RACEWAY WITH WIRE OTHER THAN #12 AWG. NUMBER ADJACENT TO STRAIGHT OR CURVED CROSS-LINES INDICATES WIRE SIZE. UNGROUNDED AND NEUTRAL CONDUCTORS SHALL BE THE SAME SIZE UNLESS OTHERWISE NOTED.

LUMINAIRE SCHEDULE

TAG	MANUFACTURER & CATALOG NUMBER	DESCRIPTION	MTG.	LAMP	VOLTS	WATTS	REMARKS
A	LITHONIA LIGHTING 2BLT4 40L ADP GZ10 LP835	2x4 DIRECT / INDIRECT TROFFER (0-10V DIMMING)	T-BAR	LED	120	32	(3)
AE	LITHONIA LIGHTING 2BLT4 40L ADP GZ10 LP835 E10WLCP	2x4 DIRECT / INDIRECT TROFFER (0-10V DIMMING)	T-BAR	LED	120	32	PROVIDE WITH 90 MIN BATTERY BACKUP
AF	LITHONIA LIGHTING 2BLT4 40L ADP GZ10 LP835 DGA24	2x4 DIRECT / INDIRECT TROFFER (0-10V DIMMING)	GYP CEILING	LED	120	32	PROVIDE GYP CEILING MOUNTING HARDWARE
D	GOTHAM ARCHITECTURAL LIGHTING EVO4 35/15 AR WD LD GZ10	4" LED DOWNLIGHT (0-10V DIMMING)	RECESSED	LED	120	14	
DE	GOTHAM ARCHITECTURAL LIGHTING EVO4 35/15 AR WD LD GZ10 E10WCP	4" LED DOWNLIGHT (0-10V DIMMING)	RECESSED	LED	120	14	PROVIDE WITH 90 MIN BATTERY BACKUP
S4	LITHONIA LIGHTING CLX L48 4000LM HEF RDL MVOLT GZ10 35K 80CRI WH	4' LED STRIP LIGHT	SUSPENDED	LED	120	32	PROVIDE MOUNTING ACCESSORIES FOR SUSPENDED INSTALLATION.
S8	LITHONIA LIGHTING CLX L96 18000LM HEF RDL MVOLT GZ10 35K 80CRI WH	4' LED STRIP LIGHT	SUSPENDED	LED	120	141	PROVIDE MOUNTING ACCESSORIES FOR SUSPENDED INSTALLATION.
P1	PLT SOLUTIONS PLTS-11979	4" SQUARE POLE (20') WITH SINGLE HEAD, 5000K COLOR TEMPERATURE WITH TYPE 5 LIGHTING DISTRIBUTION.	POLE MTD. @ 20'-0"	LED	120	220	PROVIDE PARTIAL OFF OCCUPANCY SENSOR.
W	PLT SOLUTIONS PLTS-11925	WALL PACK LED LUMINAIRE	WALL	LED	120	72	
W2	PLT SOLUTIONS PLTS-11926	WALL PACK LED LUMINAIRE	WALL	LED	120	30	
X	EVENLITE TEXZ-URC-EM-R	SINGLE FACE EXIT SIGN	UNIVERSAL	LED	120	2	
Z	LITHONIA LIGHTING ELM4L	BUG EYE	UNIVERSAL	LED	120	3	

LIGHT FIXTURE NOTES:

1. MANUFACTURER AND DESCRIPTIONS NOTED ARE TO ESTABLISH MINIMUM STANDARDS. PRODUCTS WILL BE REVIEWED BASED ON PHOTOMETRICS, CONSTRUCTION AND APPEARANCE.

MECHANICAL EQUIPMENT SCHEDULE (3)

ITEM	EQUIPMENT	VOLTAGE	HP	QUANTITY	MCA	KVA	REMARKS
SAC 1	SPLIT SYSTEM INDOOR UNIT	208V / 1PH	--	1	12.0	2.50	--
CU 1	CONDENSER UNIT	208V / 1PH	--	1	14.0	2.91	--
REF 1	EXHAUST FAN	120V / 1PH	1/20	1	2.0	0.24	--
REF 2	EXHAUST FAN	120V / 1PH	1/20	1	2.0	0.24	--
REF 3	EXHAUST FAN	208V / 3PH	3/4	1	3.5	1.26	--
REF 4	EXHAUST FAN	208V / 3PH	3/4	1	3.5	1.26	--
AC 1	AIR CONDITIONING UNIT	208V / 3PH	--	1	42.0	15.12	--
AC 2	AIR CONDITIONING UNIT	208V / 3PH	--	1	44.0	15.84	--
AC 3	AIR CONDITIONING UNIT	208V / 3PH	--	1	23.0	8.28	--
AC 4	AIR CONDITIONING UNIT	208V / 3PH	--	1	42.0	15.12	--
AC 5	AIR CONDITIONING UNIT	208V / 3PH	--	1	42.0	15.12	--
CP 1	CIRCULATION PUMP	120V / 1PH	--	1	0.7	0.09	--
EWH 1	ELECTRIC WATER HEATER	208V / 3PH	--	1	25.0	9.0	--

SHEET INDEX

SHEET	DESCRIPTION
E0.0	SYMBOLS LIST, NOTES, SHEET INDEX, LUMINAIRE SCHEDULE
E0.1	TITLE 24 COMPLIANCE FORMS
E0.2	TITLE 24 COMPLIANCE FORMS
E0.3	TITLE 24 COMPLIANCE FORMS
E0.4	TITLE 24 COMPLIANCE FORMS
E0.5	TITLE 24 COMPLIANCE FORMS
E1.0	SITE PLAN - ELECTRICAL
E2.0	ENLARGED AG SHOP - POWER & SIGNAL AND LIGHTING
E5.0	ONE LINE DIAGRAM AND LOAD CALCS
E6.0	ELECTRICAL DETAILS
E6.1	ELECTRICAL DETAILS
E6.2	ELECTRICAL DETAILS
E6.3	ELECTRICAL DETAILS
E6.4	ELECTRICAL DETAILS

GENERAL NOTES

THE CONTRACTOR SHALL VISIT JOB SITE AND VERIFY CONDITIONS BEFORE BIDDING.

THE FACILITY SHALL REMAIN IN OPERATION DURING ALL PHASES OF WORK. WHERE SYSTEM SHUTDOWNS AND POWER OUTAGES ARE UNAVOIDABLE, SUCH WORK SHALL BE SCHEDULED WITH THE FACILITY MANAGER AND SHALL OCCUR AT SUCH TIMES AS TO CAUSE THE LEAST DISRUPTION OF NORMAL FACILITY FUNCTIONS. INCLUDE ALL PREMIUM LABOR IN BID PROPOSAL TO COVER WORK REQUIRED TO BE PERFORMED BEFORE OR AFTER "NORMAL" WORKING HOURS.

COORDINATE SEQUENCE OF WORK WITH OWNER. MAKE ALL NECESSARY CONNECTIONS AS REQUIRED TO MAINTAIN POWER DURING THE STAGES OF WORK.

EXISTING DEVICES SHOWN WERE TAKEN FROM EXISTING DRAWINGS (NOT "AS BUILT" DRAWINGS) AND LIMITED SITE SURVEYS AND MAY NOT BE EXACTLY AS SHOWN. CONTRACTOR SHALL VISIT JOB SITE AND VERIFY CONDITIONS PRIOR TO BIDDING.

REFER TO THOSE DRAWINGS SHOWING OTHER WORK, AND COORDINATE PLACEMENT OF WORK WITH THAT OF OTHER TRADES. REPORT ANY CONFLICT TO ARCHITECT PRIOR TO INSTALLING WORK, ADJUST WORK AS DIRECTED BY ARCHITECT.

CORE DRILL EXISTING WALLS AND FLOORS AS REQUIRED TO FACILITATE CONDUIT INSTALLATION. SEAL ALL PENETRATIONS WATER AND SMOKE TIGHT AND IN CONFORMANCE WITH CBC SECTION 714.1 AND C.E.C. 300.21. FIRE STOP MATERIAL SHALL BE A TESTED ASSEMBLY APPROVED BY THE OSHPD FIRE MARSHAL. NO REBAR SHALL BE CUT DURING CORE DRILL OPERATION.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING NEW FIRE STOPPING OF ALL NEW OR EXISTING CONDUIT OR CABLE PENETRATIONS IN NEW OR EXISTING FIRE RATED WALLS WITHIN THE LIMITS OF WORK.

ALL EQUIPMENT INSTALLED OR CONNECTED BY THE CONTRACTOR SHALL BE LABELED OR CERTIFIED FOR ITS USE BY A NATIONALLY RECOGNIZED TESTING LABORATORY.

NO PIPING, DUCTS, EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT OR ARCHITECTURAL APPURTENANCES SHALL BE IN THE DEDICATED SPACE FOR SWITCHBOARD(S), PANELBOARD(S), AND/OR MOTOR CONTROL CENTER(S) PER CEC 110.26(F).

UNLESS OTHERWISE INDICATED, ALL 20 AMP 120 OR 277 VOLT BRANCH CIRCUITS SHALL HAVE DEDICATED NEUTRALS. DO NOT SHARE NEUTRALS.

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SACRAMENTO, CA. 95815
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JOB NO. 22-Q153.00 PM BS
DESIGNERS BS
DRAWN BY ECOM

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN SCHLENKER
No. E 021982
Exp. 9/30/25
ELECTRICAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

SYMBOLS LIST, NOTES, SHEET INDEX, LUMINAIRE SCHEDULE

REVISIONS:

	DATE	DESCRIPTION
1	07/29/24	ALL ELECTRIC

DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E0.0
OF - SHEETS

STATE OF CALIFORNIA
Electrical Power Distribution CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: YOLO COUNTY AG DEPARTMENT SHOPS BUILDING	**Report Page:** (Page 1 of 6)
Project Address: 120 W. MAIN STREET, WOODLAND, 95695	**Date Prepared:** 2024-08-20T13:40:29-04:00

This document is used to demonstrate compliance with mandatory requirements in 130.5, for electrical systems in newly constructed nonresidential and hotel/motel occupancies and 160.6 and 160.9 for electrical systems in newly constructed multifamily occupancies. Additions and alterations to electrical service systems in nonresidential and hotel/motel occupancies will also use this document to demonstrate compliance per 141.0(a) or 141.0(b)2P for alterations. For multifamily addition or alterations compliance will be documented per 180.1(a) or 180.2 (b)4Bwii

A. GENERAL INFORMATION

01	Project Location (city)	WOODLAND	02	Climate Zone	12
			03	Occupancy Types Within Project:	OfficeWarehouse

B. PROJECT SCOPE

This table includes electrical systems that are within the scope of the permit application.

01	02	03	04	05	06	07
Electrical Service Designation/ Description	Scope of Work[1]	Rating[2] (kVA)	Utility Provided Metering System Exception to 130.5(a)/ 160.6(a)[3]	System subject to CA Elec Code Article 517 Exception to 130.5(a)and (b)	Demand Response Controls	Provides power to dwelling units/common living areas only in multifamily occupancy
MAIN SWITCHBOARD 'MSB'	New electrical service equipment and meter	225	☒	☐	Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal. Sections 120.2/ 160.3, 130.1/ 160.5, and 130.3/ 160.5, and mechanical, indoor lighting, and sign lighting Certificate of Compliance documents will indicate when demand response controls are required.	☐

[1] *FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c)/160.6(c), no other requirements from 130.5/160.6 are required.*
[2] *If common use areas in a multifamily are submetered, rating is for submeter size serving common use areas.*
[3] *Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.*

STATE OF CALIFORNIA
Electrical Power Distribution CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
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C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through I. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

01		02		03		04	05	06
Service Electrical Metering 130.5(a)/ 160.6(a) (See Table F)	AND	Separation for Monitoring 130.5(b)/ 160.6(b) (See Table G)	AND	Voltage Drop 130.5(c)/ 160.6(c) (See Table H)	AND	Controlled Receptacles 130.5(d)/ 160.6(d) (See Table I)	Electric Ready 160.9 (See Table J)	**Compliance Results**
	AND	Yes	AND	Yes	AND	Yes		COMPLIES with Exceptional Conditions

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

Table B indicates the project is exempt from 130.5(a) Service Electrical Metering requirements because the utility company has provided the project a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

STATE OF CALIFORNIA
Electrical Power Distribution CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: YOLO COUNTY AG DEPARTMENT SHOPS BUILDING	**Report Page:** (Page 3 of 6)
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G. SEPARATION OF ELECTRICAL CIRCUITS FOR ENERGY MONITORING

This table includes entirely new or complete replacement electrical power distribution systems to demonstrate compliance with 130.5(b)/ 160.6(b). Any load types that are not included in the service do not need to be shown. For multifamily occupancies, submetered systems that provide power to dwelling units do not need to meet these separation requirements and therefore load types on those submetered systems also do not need to be shown.

01	02	03	04	05	
Load Type per Table 130.5-B[1]	Minimum Required Separation of Load per Table 130.5-B	Compliance Method[2]	Location of Requirements in Construction Documents	Field Inspector	
				Pass	Fail
MAIN SWITCHBOARD 'MSB'					
Lighting including exit, egress and exterior	All lighting in aggregate	Method 2: Switchboards/ motor control centers/ panelboard supply other distribution equipment with loads disaggregated for each load type	E5.0	☐	☐
HVAC systems and components	All HVAC in aggregate	Method 2: Switchboards/ motor control centers/ panelboard supply other distribution equipment with loads disaggregated for each load type	E5.0	☐	☐
Plug Loads and appliances less than 25kVA	All plug loads in aggregate Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	Method 3: Branch circuits serve load types individually & provisions for adding future branch curcuit monitoring	E5.0	☐	☐

STATE OF CALIFORNIA
Electrical Power Distribution CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: YOLO COUNTY AG DEPARTMENT SHOPS BUILDING	**Report Page:** (Page 4 of 6)
	Date Prepared: 2024-08-20T13:40:29-04:00

G. SEPARATION OF ELECTRICAL CIRCUITS FOR ENERGY MONITORING

This table includes entirely new or complete replacement electrical power distribution systems to demonstrate compliance with 130.5(b)/ 160.6(b). Any load types that are not included in the service do not need to be shown. For multifamily occupancies, submetered systems that provide power to dwelling units do not need to meet these separation requirements and therefore load types on those submetered systems also do not need to be shown.

01	02	03	04	05	
Load Type per Table 130.5-B[1]	Minimum Required Separation of Load per Table 130.5-B	Compliance Method[2]	Location of Requirements in Construction Documents	Field Inspector	
				Pass	Fail
Charging stations for electrical vehicle	All loads in aggregate	Method 1: Switchboards, motor control centers, or panelboard loads disaggregated for each load type	E5.0	☐	☐

** NOTES: If "Other*" is selected under Compliance Method above, please indicate how compliance has been achieved in the space provided below.*

[2] *FOOTNOTES: For each separate load type, up to 10% of the connected load may be of any type.*
Method 1: Switchboards/ motor control centers/ panelboard loads disaggregated for each load type.
Method 2: Switchboards/ motor control centers/ panelboard supply other distribution equipment with loads disaggregated for each load type.
Method 3: Branch circuits serve load types individually and provisions for adding future branch circuit monitoring.
Method 4: Complete metering system measures and reports loads by type.
See Chapter 8 of the Nonresidential Compliance Manual for more detail on Compliance Methods.

H. VOLTAGE DROP

This table includes entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with 130.5(c)/ 160.6(c). For alterations, only the altered circuits must demonstrate compliance per 141.0(b)2Piii/ 180.2(b)4Bviic.

01	02				03	04	05	
Electrical Service Designation/Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method				Location of Voltage Drop Calculations[1]	Sheet Number for Voltage Drop Calculations in Construction Documents	Field Inspector	
							Pass	Fail
MAIN SWITCHBOARD 'MSB'	☒	Voltage drop less than 5%	☐	Permitted by CA Elec Code (Exception to 130.5(c))*	In construction documents	E5.0	☐	☐

** NOTES: If "Permitted by CA Elec Code **" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.*

STATE OF CALIFORNIA
Electrical Power Distribution CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
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H. VOLTAGE DROP

[1] *FOOTNOTES: Voltage drop calculations may be attached to the permit application outside the construction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".*

I. CIRCUIT CONTROLS FOR 120-VOLT RECEPTACLES AND CONTROLLED RECEPTACLES

This table includes entirely new or complete replacement electrical power distribution systems to demonstrate compliance with 130.5(d)/ 160.6(d).. Both controlled and uncontrolled receptacles must be provided in office areas, lobbies, conference rooms, kitchen areas in office spaces, copy rooms and hotel/motel guest rooms.

01	02	03	04	05	06	07	
Room name or Description	Location/ Type of Controlled Receptacles[1]	Shut-Off Controls	Demand Responsive Controls	Permanent Durable Marking Will be Used	Location of Requirements in Construction Documents	Field Inspector	
						Pass	Fail
BREAKROOM 102	Split-wired receptacle	Occupancy Sensor	NA: Building does not require demand responsive lighting controls per 110.12(c)	☒	E2.0	☐	☐

** NOTES: If "Other*" is selected under Shut-Off Controls above, please indicate how compliance has been achieved in the space provided below.*

[1] *FOOTNOTES: Receptacles dedicated to refrigerators and water dispensers in kitchens, located a minimum of 6ft above the floor specifically for clocks, network copiers, fax machines, A/V and data equipment other than personal computers in copy rooms, circuits rated more than 20 Amps, or connected to a UPS that are intended to be in continuous use and are marked to differentiate them from other receptacles or circuits are excepted from the requirements. .*

K. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-ELC-E - Must be submitted for all buildings

L. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no forms required for this project.

STATE OF CALIFORNIA
Electrical Power Distribution CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: YOLO COUNTY AG DEPARTMENT SHOPS BUILDING	**Report Page:** (Page 6 of 6)
Project Address: 120 W. MAIN STREET, WOODLAND, 95695	**Date Prepared:** 2024-08-20T13:40:29-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: BEN SCHLENKER	Documentation Author Signature:
Company: ECOM Engineering Inc.	Signature Date: 08-20-2024
Address: 1455 RESPONSE ROAD, SUITE 140	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: SACRAMENTO, CA 95815	Phone: (916) 641-5600

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation provided to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company: ECOM Engineering, Inc.	Date Signed: 08-20-2024
Address: 1455 RESPONSE ROAD, SUITE 140	License: 021982
City/State/Zip: SACRAMENTO, CA 95815	Phone: (916) 641-5600

Electrical Power Distribution Mandatory Measures:

110.12(a) DEMAND RESPONSIVE (DR) CONTROLS
ALL DEMAND RESPONSIVE CONTROLS SHALL:
1. BE EITHER A. CERTIFIED OPENADR 2.0a OR OPENADR 2.0b VIRTUAL END NODE (VEN); OR B. CERTIFIED BY THE MANUFACTURER AS BEING CAPABLE OF RESPONDING TO A DR SIGNAL FROM A CERTIFIED OPENADR 2.0b VEN AUTOMATICALLY IMPLEMENTING THE CONTROL FUNCTIONS REQUESTED BY THE VEN FOR THE EQUIPMENT IT CONTROLS.
2. BE CAPABLE OF COMMUNICATING USING ONE OR MORE OF THE FOLLOWING: WI-FI, ZIGBEE, BACNET, ETHERNET, OR HARD-WIRING.
3. CONTINUE TO PERFORM ALL OTHER CONTROL FUNCTIONS PROVIDED BY THE CONTROL WHEN COMMUNICATIONS ARE DISABLED OR UNAVAILABLE.
4. DR CONTROL THERMOSTATS SHALL COMPLY WITH REFERENCE JOINT APPENDIX 5 (JA5), TECHNICAL SPECIFICATIONS FOR OCCUPANT CONTROLLED SMART THERMOSTATS.

110.12(d) DEMAND RESPONSIVE ELECTRONIC MESSAGE CENTER CONTROL
CONTROLS FOR ELECTRONIC MESSAGE CENTERS GREATER THAN 15KW SHALL BE CAPABLE OF REDUCING THE LIGHTING POWER BY A MINIMUM OF 30% WHEN RECEIVING A DR SIGNAL.

130.5(b) SEPARATION OF CIRCUITS FOR ELECTRICAL ENERGY MONITORING
ELECTRICAL POWER DISTRIBUTION SYSTEMS SHALL BE DESIGNED SO THAT MEASUREMENT DEVICES CAN MONITOR ENERGY USE OF LOAD TYPES ACCORDING TO TABLE 130.5-B.

130.5(c) VOLTAGE DROP
THE MAXIMUM COMBINED VOLTAGE DROP ON BOTH INSTALLED FEEDER AND BRANCH CIRCUIT CONDUCTORS TO THE FARTHEST CONNECTED LOAD OR OUTLET SHALL NOT EXCEED 5%.

130.5(d) CIRCUIT CONTROLS FOR 120-VOLT RECEPTACLES AND CONTROLLED RECEPTACLES
BOTH CONTROLLED AND UNCONTROLLED 120-VOLT RECEPTACLES SHALL BE PROVIDED IN OFFICE AREAS, LOBBIES, CONFERENCE ROOMS, KITCHEN AREAS IN OFFICE SPACES, AND COPY ROOMS.
CONTROLLED RECEPTACLES SHALL:
- BE CAPABLE OF AUTOMATICALLY SHUTTING OFF WHEN THE SPACE IS UNOCCUPIED, EITHER AT RECEPTACLE OR CIRCUIT LEVEL. AUTOMATIC TIME SWITCH CONTROL SHALL INCORPORATE OVERRIDE CONTROL ALLOWING CONTROLLED RECEPTACLE TO REMAIN ON FOR NO MORE THAN 2 HOURS AND AN AUTOMATIC HOLIDAY SHUT-OFF TO TURN OFF ALL LOADS FOR AT LEAST 24 HOURS THEN RESUME NORMAL SCHEDULE. COUNTDOWN TIMER SWITCHES SHALL NOT BE USED FOR COMPLIANCE.
- EITHER A SPLITWIRE RECEPTACLE SHALL BE INSTALLED, OR AT LEAST ONE CONTROLLED RECEPTACLE SHALL BE INSTALLED WITHIN 6 FT OF EACH UNCONTROLLED RECEPTACLE. FOR MODULAR FURNITURE, INSTALL ONE CONTROLLED RECEPTACLE PER WORKSTATION.
- INCLUDE PERMANENT AND DURABLE MARKINGS TO DIFFERENTIATE THEM FROM UNCONTROLLED RECEPTACLES OR CIRCUITS.

NOTE: HARDWIRED POWER STRIP CONTROLLED BY AN OCCUPANT SENSING CONTROL MAY BE USED TO COMPLY WITH 130.5(d). PLUG-IN DEVICES MAY NOT BE USED FOR COMPLIANCE.

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JOB NO. 22-Q153.00 PM. BS
DESIGNERS BS
DRAWN BY ECOM

REGISTERED PROFESSIONAL ENGINEER BENJAMIN SCHLENKER No. E 021982 Exp. 9/30/25 ELECTRICAL STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA
TITLE 24 COMPLIANCE FORMS

REVISIONS:

	DATE▲	DESCRIPTION▲
1	07/29/24	ALL ELECTRIC

DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E0.1 3
OF - SHEETS

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTI-E
Project Name: YOLO COUNTY AG DEPARTMENT SHOPS BUILDING	**Report Page:** (Page 1 of 12)
Project Address: 120 W. MAIN STREET, WOODLAND, 95695	**Date Prepared:** 2024-08-20T19:23:35-04:00

This document is used to demonstrate compliance with requirements in 110.9, 110.12(c), 130.0, 130.1, 140.6 and 141.0(b)2 for indoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e) and 180.2(b)4 for indoor lighting scopes using the prescriptive path for multifamily occupancies. Multifamily includes dormitory and senior living facilities.

A. GENERAL INFORMATION

01	Project Location (city)	WOODLAND	04 Total Conditioned Floor Area (ft²)	6,020
02	Climate Zone	12	05 Total Unconditioned Floor Area (ft²)	0
03	Occupancy Types Within Project (select all that apply):		06 # of Stories (Habitable Above Grade)	1

● Office ● Parking Garage ● Warehouse

B. PROJECT SCOPE

This table includes any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.6 / 170.2(e) or 141.0(b)2 / 180.2(b)4 for alterations.

Scope of Work	Conditioned Spaces		Unconditioned Spaces	
01	02	03	04	05
My Project Consists of (check all that apply):	Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☒ New Lighting System	Area Category Method	6020	N/A	0
☐ New Lighting System - Parking Garage	N/A	0	N/A	0
Total Area of Work (ft²)	6020			

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C. COMPLIANCE RESULTS

If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

Lighting in conditioned and unconditioned spaces must not be combined for compliance per 140.6(b)1 / 170.2(e)	Allowed Lighting Power per 140.6(b) / 170.2(e) (Watts)						Adjusted Lighting Power per 140.6(a) / 170.2(e) (Watts)				Compliance Results
	01	02	03	04		05	06	07		08	09
	Complete Building 140.6(c)1	Area Category 140.6(c)2 / 170.2(e)4	Area Category Additional 140.6(c)2G / 170.2(e)4Av (+)	Tailored 140.6(c)3 / 170.2(e)4B (+)	=	**Total Allowed** (Watts)	≥	Total Designed (Watts)	Adjustments: PAF Lighting Control Credits 140.6(a)2 / 170.2(e)1B (-)	=	**Total Adjusted** (Watts) *Includes Adjustments	**05 must be >= 08 140.6 / 170.2(e)**
	(See Table I)	(See Table I)	(See Table J)	(See Table K)				(See Table F)	(See Table P)		
Conditioned		3,881.15	1,693.8		=	5,574.95	≥	3,077		=	3077	COMPLIES
Unconditioned					=		≥			=		
Controls Compliance (See Table H for Details)												COMPLIES
Rated Power Reduction Compliance (See Table Q for Details)												

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

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Indoor Lighting
CALIFORNIA ENERGY COMMISSION

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F. INDOOR LIGHTING FIXTURE SCHEDULE

This table includes all planned permanent and portable lighting other than dwelling unit/ hotel/ motel room lighting. Multifamily dwelling unit and hotel/motel room lighting is documented in Table T. If using Table T to document lighting in multifamily common use areas providing shared provisions for living, eating, cooking or sanitation, those luminaires are not included here.

Designed Wattage: Conditioned Spaces

01 Name or Item Tag	02 Complete Luminaire Description	03 Modular (Track) Fixture	04 Small Aperture & Color Change[1]	05 Watts per luminaire[2]	06 How is Wattage determined	07 Total Number of Luminaires	08 Excluded per 140.6(a)3 / 170.2(e)2C	09 Design Watts	10 Field Inspector: Pass	10 Field Inspector: Fail
A	2X4 DIRECT/INDIRECT TROFFER	No	NA	32	Mfr. Spec	12	No	384	☐	☐
AE	2X4 DIRECT/INDIRECT TROFFER	No	NA	32	Mfr. Spec	5	No	160	☐	☐
AF	2X4 DIRECT/INDIRECT TROFFER	No	NA	32	Mfr. Spec	4	No	128	☐	☐
D	4" LED DOWNLIGHT	No	NA	14	Mfr. Spec	4	No	56	☐	☐
DE	4" LED DOWNLIGHT	No	NA	14	Mfr. Spec	3	No	42	☐	☐
S4	4' LED STRIP LIGHT	No	NA	32	Mfr. Spec	6	No	192	☐	☐
S8	8' LED STRIP LIGHT	No	NA	141	Mfr. Spec	15	No	2,115	☐	☐
						Total Designed Watts: CONDITIONED SPACES		3,077		

[1]*FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per 140.6(a)4B / 170.2(e)2D is adjusted to be 75% /80% of their rated wattage. Table F automatically makes this adjustment, the permit applicant should enter full rated wattage in column 05.*

[2]*Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b). Wattage used must be the maximum rated for the luminaire, not the lamp.*

G. MODULAR LIGHTING SYSTEMS

This section does not apply to this project.

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H. INDOOR LIGHTING CONTROLS (Not including PAFs)

This table includes lighting controls for conditioned and unconditioned spaces.

Building Level Controls

01	02	03 Field Inspector: Pass	03 Field Inspector: Fail
Mandatory Demand Response 110.12(c)	Shut-off controls 130.1(c) / 160.5(b)4C		
NA < 4,000W subject to multilevel	See Area/Space Level Controls	☐	☐

Area Level Controls

04 Area Description	05 Complete Building or Area Category Primary Function Area	06 Manual Area Controls 130.1(a) / 160.5(b)4A	07 Multi-Level Controls 130.1(b) / 160.5(b)4B	08 Shut-Off Controls 130.1(c) // 160.5(b)4C	09 Primary/Sky lit Daylighting 130.1(d) / 160.5(b)4D	10 Secondary Daylighting 130.1(d) / 160.5(b)4D	11 Interlocked Systems 140.6(a)1/ 170.2(e)2A	12 Field Inspector: Pass	12 Field Inspector: Fail
BREAKROOM 102	Kitchen/ Food Preparation	Readily Accessible	Dimmer	Occupancy Sensor	Included	NA: Not daylit zone	No	☐	☐
PESTICIDE ID LAB 101	Laboratory Area, Scientific	Readily Accessible	Dimmer	Occupancy Sensor	Included	NA: Not daylit zone	No	☐	☐
RESTROOM 103	Restroom	Readily Accessible	Dimmer	Occupancy Sensor	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
TRAPPING SUPPLY RM 104	General Commercial Industrial Work Area Precision	Readily Accessible	Dimmer	Occupancy Sensor	Included	NA: Not daylit zone	No	☐	☐
IT 104A	Electrical Mechancial Telephone Room	Readily Accessible	NA: Enclosed area <100SF	NA: Elec. equip. rm	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
METROLOGY LAB 105	Laboratory Area, Scientific	Readily Accessible	Dimmer	Occupancy Sensor	Included	NA: Not daylit zone	No	☐	☐
BELL PROVER LAB 107	Laboratory Area, Scientific	Readily Accessible	Dimmer	Occupancy Sensor	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
STORAGE 109	General Commercial Industrial Work Area Precision	Readily Accessible	Dimmer	Occupancy Sensor	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐

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H. INDOOR LIGHTING CONTROLS (Not including PAFs)

MAINTENANCE SHOP 108	General Commercial Industrial Work Area Precision	Readily Accessible	Dimmer	Occupancy Sensor	Included	NA: Skylight shaded	No	☐	☐
WELDING 110	General Commercial Industrial Work Area Precision	Readily Accessible	Dimmer	Occupancy Sensor	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
PARKING BAYS 111	Parking Garage - Parking Area & Ramps	Readily Accessible	Dimmer	Occupancy Sensor	Included	NA: Not daylit zone	No	☐	☐
						13			
						Plan Sheet Showing Daylit Zones:			
						E2.0			

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

Each area complying using the Complete Building or Area Category Methods per 140.6(b) are included in this table. Column 06 indicates if additional lighting power allowances per 140.6(c) or adjustments per 140.6(a) are being used .

Conditioned Spaces

01 Area Description	02 Complete Building or Area Category Primary Function Area	03 Allowed Density (W/ft²)	04 Area (ft²)	05 Allowed Wattage (Watts)	06 Additional Allowance / Adjustment: Area Category	06 Additional Allowance / Adjustment: PAF
BREAKROOM 102	Kitchen/ Food Preparation	0.95	315	299.25	No	No
PESTICIDE ID LAB 101	Laboratory Area, Scientific	0.9	330	297	Yes	No
RESTROOM 103	Restroom	0.65	296	192.4	No	No
TRAPPING SUPPLY RM 104	General Commercial Industrial Work Area Precision	0.85	685	582.25	Yes	No
IT 104A	Electrical Mechancial Telephone Room	0.4	50	20	No	No
METROLOGY LAB 105	Laboratory Area, Scientific	0.9	522	469.8	Yes	No
WATER TESTING 106	Laboratory Area, Scientific	0.9	647	582.3	Yes	No
BELL PROVER LAB 107	Laboratory Area, Scientific	0.9	318	286.2	Yes	No
STORAGE 109	General Commercial Industrial Work Area Precision	0.85	200	170	Yes	No

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I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

MAINTENANCE SHOP 108	General Commercial Industrial Work Area Precision	0.85	892	758.2	Yes	No
WELDING 110	General Commercial Industrial Work Area Precision	0.85	63	53.55	Yes	No
PARKING BAYS 111	Parking Garage - Parking Area & Ramps	0.1	1,702	170.2	No	No
		TOTALS:	6,020	3,881.15	See Tables J, or P for detail	

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J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM

All areas indicated in Table I as using an additional allowance using the Area Category Method have been included in this table to calculate the additional allowance per Table 140.6-C /170.2-M

Conditioned Spaces

01 Area Description	02 Primary Function Area	03 Applicable Qualifying Lighting System from Table 140.6-C	04 Allowed Density (W/ft² or W/lf or W/unit)	05 Ltg Area, Length or ATM/Mirror (ft², lf or #)	06 Extra Allowance (Watts)	07 Luminaire Name or Item Tag	08 Watts per Luminaire	09 Number of Luminaires	10 Total Design Watts
PESTICIDE ID LAB 101	Laboratory Area, Scientific	SpecializedTaskLighting	0.35	330	115.5	A	32	5	160
						AE	32	2	64
Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
224	115.5	115.5							
TRAPPING SUPPLY RM 104	General Commercial Industrial Work Area Precision	PrecisionLighting/Industrial	0.7	685	479.5	S4	32	1	32
						S8	141	3	423
Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
455	479.5	455							
METROLOGY LAB 105	Laboratory Area, Scientific	SpecializedTaskLighting	0.35	522	182.7	A	32	2	64
						AE	32	2	64
Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
128	182.7	128							
WATER TESTING 106	Laboratory Area, Scientific	SpecializedTaskLighting	0.35	647	226.45	A	32	5	160
						AE	32	1	32

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JOB NO. 22-Q153.00 PM. BS
DESIGNERS BS
DRAWN BY ECOM

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN SCHLENKER
No. E 021982
Exp. 9/30/25
ELECTRICAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA
TITLE 24 COMPLIANCE FORMS

REVISIONS:

	DATE	DESCRIPTION
1	07/29/24	ALL ELECTRIC

DATE 12.09.22
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J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM

Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
192	226.45	192							
BELL PROVER LAB 107	Laboratory Area, Scientific	SpecializedTaskLighting	0.35	318	111.3	A	32	4	128
Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
128	111.3	111.3							
STORAGE 109	General Commercial Industrial Work Area Precision	PrecisionLighting/Industrial	0.7	200	140	S4	32	3	96
Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
96	140	96							
MAINTENANCE SHOP 108	General Commercial Industrial Work Area Precision	PrecisionLighting/Industrial	0.7	892	624.4	S8	141	4	564
Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
564	624.4	564							
WELDING 110	General Commercial Industrial Work Area Precision	PrecisionLighting/Industrial	0.7	63	44.1	S4	32	1	32
Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
32	44.1	32							
11									
Total Additional Allowance (Watts) CONDITIONED SPACES		1693.8							

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE
This section does not apply to this project.

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY
This section does not apply to this project.

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING
This section does not apply to this project.

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED DECORATIVE /SPECIAL EFFECTS
This section does not apply to this project.

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE
This section does not apply to this project.

P. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF))
This section does not apply to this project.

Q. RATED POWER REDUCTION COMPLIANCE FOR ONE-FOR-ONE ALTERATIONS
This section does not apply to this project.

R. 80% LIGHTING POWER FOR ALL ALTERATIONS - CONTROLS EXCEPTIONS
This section does not apply to this project.

S. DAYLIGHT DESIGN POWER ADJUSTMENT FACTOR (PAF)
This section does not apply to this project.

T. DWELLING UNIT LIGHTING
This section does not apply to this project.

U. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION
Selections have been made based on information provided in this document. If any selections have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTI-E - Must be submitted for all buildings

V. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selections have been changed by the permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	BREAKROOM 102; PESTICIDE ID LAB 101; RESTROOM 103; TRAPPING SUPPLY RM 104; METROLOGY LAB 105; BELL PROVER LAB 107; STORAGE 109; MAINTENANCE SHOP 108; WELDING 110; PARKING BAYS 111
NRCA-LTI-03-A - Must be submitted for automatic daylight controls.	BREAKROOM 102; PESTICIDE ID LAB 101; TRAPPING SUPPLY RM 104; METROLOGY LAB 105; MAINTENANCE SHOP 108; PARKING BAYS 111

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: BEN SCHLENKER	Documentation Author Signature:
Company: ECOM Engineering Inc.	Signature Date: 08-20-2024
Address: 1455 RESPONSE ROAD, SUITE 140	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: SACRAMENTO, CA 95815	Phone: (916) 641-5600

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: BEN SCHLENKER	Responsible Designer Signature:
Company: ECOM Engineering Inc.	Date Signed: 08-20-2024
Address: 1455 RESPONSE ROAD, SUITE 140	License: 021982
City/State/Zip: SACRAMENTO, CA 95815	Phone: (916) 641-5600

Indoor Lighting Mandatory Measures:

130.1(c)7 PARTIAL-OFF OCCUPANT SENSORS
PROVIDE PARTIAL-OFF OCCUPANT SENSORS IN THE FOLLOWING SPACES INSTEAD OF COMPLYING WITH 130.1(c)1:
- PARKING GARAGES/AREAS AND LOADING UNLOADING AREAS WITH NO MORE THAN 500 WATTS PER CONTROLLED ZONE.
- LIGHTING IN STAIRWELLS AND COMMON AREA CORRIDORS PROVIDING ACCESS TO GUEST ROOMS SHALL REDUCE LIGHTING POWER BY 50% WHEN UNOCCUPIED.

130.1(d) AUTOMATIC DAYLIGHTING CONTROLS
ALL GENERAL LIGHTING IN THE FOLLOWING ZONES SHALL HAVE CONTROLS THAT AUTOMATICALLY ADJUST THE INSTALLED LIGHTING POWER UP AND DOWN TO KEEP TOTAL LIGHT LEVEL STABLE AS INCOMING DAYLIGHT CHANGES:
- PRIMARY SIDELIT DAYLIT ZONES
- SECONDARY SIDELIT DAYLIT ZONES
- COMBINED PRIMARY AND SECONDARY SIDELIT DAYLIT ZONES IN PARKING GARAGES

ALL DAYLIT ZONES MUST BE SHOWN ON PLANS.

NOTE: PARKING AREAS ON THE ROOF OF A PARKING STRUCTURE ARE NOT SKYLIT DAYLIT AREAS.

IN ADDITION, AUTOMATIC DAYLIGHTING CONTROLS SHALL PROVIDE SEPARATE CONTROL FOR LUMINAIRES IN EACH TYPE OF DAYLIT ZONE. LUMINAIRES THAT FALL IN BOTH SKYLIT AND SIDELIT DAYLIT ZONE SHALL BE CONTROLLED AS PART OF THE SKYLIT ZONE.

130.1(d)3 THE AUTOMATIC DAYLIGHTING CONTROLS SHALL ACHIEVE ALL OF THE FOLLOWING:
A. ADJUST LIGHTING VIA CONTINUOUS DIMMING OR THE NUMBER OF CONTROL STEPS PROVIDED BY THE MULTILEVEL CONTROLS (FOR SPACES REQUIRED TO INSTALL MULTILEVEL CONTROLS UNDER SECTION 130.1(b)).

B. FOR EACH SPACE, ENSURE COMBINED ILLUMINANCE FROM CONTROLLED LIGHTING AND DAYLIGHT IS NOT LESS THAN ILLUMINANCE FROM CONTROLLED LIGHTING WHEN NO DAYLIGHT IS AVAILABLE.

C. ENSURE THAT THE GENERAL LIGHTING POWER IN A DAYLIT ZONE SHALL BE REDUCED BY AT LEAST 90% WHEN DAYLIGHT ILLUMINANCE IN THAT ZONE IS GREATER THAN 150% OF DESIGN ILLUMINANCE RECEIVED FROM THE GENERAL LIGHTING SYSTEM AT FULL POWER (NOT APPLICABLE TO PARKING GARAGES).

D. (FOR PARKING GARAGES ONLY) ENSURE THAT WHEN ILLUMINANCE LEVELS MEASURED AT THE FARTHEST EDGE OF THE SECONDARY SIDELIT ZONE AWAY FROM GLAZING OR OPENING ARE GREATER THAN 150% OF THE ILLUMINANCE PROVIDED BY THE CONTROLLED LIGHTING WHEN NO DAYLIGHT IS AVAILABLE, THE CONTROLLED LIGHTING POWER IN THE COMBINED PRIMARY AND SECONDARY SIDELIT DAYLIT ZONES SHALL BE REDUCED BY 100%.

130.1(d)4 WHEN PHOTOSENSORS ARE LOCATED WITHIN THE DAYLIT ZONE, AT LEAST ONE PHOTOSENSOR SHALL BE LOCATED SO THAT IT IS NOT READILY ACCESSIBLE TO UNAUTHORIZED PERSONNEL.

130.1(d)5 THE LOCATION WHERE CALIBRATION ADJUSTMENTS ARE MADE TO AUTOMATIC DAYLIGHTING CONTROLS SHALL BE READILY ACCESSIBLE TO AUTHORIZED PERSONNEL BUT MAY BE INSIDE A LOCKED CASE OR UNDER A COVER THAT REQUIRES A TOOL FOR ACCESS.

Indoor Lighting Mandatory Measures:

130.1(a) MANUAL AREA CONTROLS
EACH ROOM OR AREA WITH FLOOR-TO-CEILING WALLS IN THIS BUILDING SHALL HAVE LIGHTING CONTROLS THAT ALLOW LIGHTING TO BE MANUALLY TURNED ON AND OFF MANUAL CONTROLS SHALL:

1. BE READILY ACCESSIBLE
2. BE LOCATED IN THE SAME ENCLOSED AREA WITH THE LIGHTING IT CONTROLS.
3. PROVIDE SEPARATE CONTROL OF GENERAL, FLOOR, WALL, WINDOW CASE DISPLAY, ORNAMENTAL AND SPECIAL EFFECTS LIGHTING SO EACH TYPE CAN BE TURNED ON AND OFF SEPARATELY WITHOUT AFFECTING OTHER LIGHTING OR EQUIPMENT.

130.1(b) MULTILEVEL LIGHTING CONTROLS
GENERAL LIGHTING IN ALL ROOMS AND AREAS 100 FT2 OR GREATER AND WITH MORE THAN 0.5 WATTS PER FT2 OF LIGHTING LOAD SHALL HAVE MULTILEVEL CONTROLS THAT ALLOW LIGHT LEVELS TO BE ADJUSTED UP AND DOWN. CONTROLS SHALL PROVIDE NUMBER OF CONTROL STEPS AND UNIFORM ILLUMINANCE LIGHT LEVELS PER TABLE 130.1-A.

130.1(c): SHUTOFF CONTROLS
ALL INSTALLED INDOOR LIGHTING SHALL BE EQUIPPED WITH CONTROLS TO AUTOMATICALLY REDUCE LIGHTING POWER WHEN SPACE IS TYPICALLY UNOCCUPIED.

130.1(c)1: CONTROL REQUIREMENTS
ALL INSTALLED INDOOR LIGHTING SHALL HAVE ALL OF THE FOLLOWING:
A. CONTROL(S) CAPABLE OF AUTOMATICALLY SHUTTING OFF ALL LIGHTING IN THE SPACE WHEN TYPICALLY UNOCCUPIED (OCCUPANT SENSING CONTROL, AUTOMATIC TIME-SWITCH CONTROL, OR OTHER)
B. SEPARATE CONTROLS FOR LIGHTING ON EACH FLOOR (OTHER THAN STAIRWELLS)

C. SEPARATE CONTROLS FOR A SPACE ENCLOSED BY CEILING HEIGHT PARTITIONS NOT EXCEEDING 5,000 FT2

130.1(c)6 PARTIAL OR FULL-OFF OCCUPANT SENSORS
PROVIDE PARTIAL OR FULL-OFF OCCUPANT SENSORS, IN ADDITION TO SHUTOFF CONTROLS PER 130.1(c)1 AND 130.1(c)2, IN THE FOLLOWING SPACES:
- AISLE WAYS AND OPEN AREAS IN WAREHOUSES
- LIBRARY BOOK STACK AISLES
- CORRIDORS AND STAIRWELLS
- OFFICES GREATER THAN 250 SQ. FT.

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JOB NO. 22-Q153.00 PM. BS
DESIGNERS BS
DRAWN BY ECOM

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN SCHLENKER
No. E 021982
Exp. 9/30/25
ELECTRICAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA
TITLE 24 COMPLIANCE FORMS

REVISIONS:

	DATE	DESCRIPTION
3	07/29/24	ALL ELECTRIC

DATE	12.09.22
DRAWN	-
JOB NO.	21027
SHEET	E0.3 (3)
OF	- SHEETS

Indoor Lighting Mandatory Measures:

130.1(f) CONTROL INTERACTIONS
EACH LIGHTING CONTROL INSTALLED TO MEET 130.1 REQUIREMENTS SHALL INCORPORATE THE FUNCTIONS OF OTHER LIGHTING CONTROLS REQUIRED BY THIS SECTION.

1. FOR GENERAL LIGHTING, MANUAL AREA CONTROL SHALL PERMIT THE LEVEL OF LIGHT PROVIDED WHILE LIGHTING IS ON TO BE SET OR ADJUSTED BY CONTROLS SPECIFIED IN 130.1(b), (c), (d) and (e).

2. MANUAL AREA CONTROL SHALL PERMIT SHUTOFF CONTROL TO TURN THE LIGHTING DOWN OR OFF.

3. MULTILEVEL CONTROL SHALL PERMIT THE AUTOMATIC DAYLIGHTING CONTROL TO ADJUST ELECTRIC LIGHTING IN RESPONSE TO DAYLIGHT.

4. MULTILEVEL CONTROL SHALL PERMIT THE DEMAND RESPONSIVE (DR) CONTROL TO ADJUST LIGHTING DURING A DR EVENT THEN RETURN IT TO THE LEVEL SET BY THE CONTROL AFTER THE EVENT.

5 SHUTOFF CONTROL SHALL PERMIT THE MANUAL AREA CONTROL TO TURN THE LIGHTING ON.

6. AUTOMATIC DAYLIGHTING CONTROL SHALL PERMIT MULTILEVEL LIGHTING CONTROL TO ADJUST THE LIGHTING LEVEL.

7. FOR LIGHTING CONTROLLED BY MULTILEVEL LIGHTING CONTROLS AND OCCUPANT SENSING CONTROLS THAT PROVIDE AUTOMATIC-ON FUNCTION, CONTROLS SHALL PROVIDE A PARTIAL-ON FUNCTION THAT IS CAPABLE OF AUTOMATICALLY ACTIVATING BETWEEN 50-70% OF CONTROLLED LIGHTING POWER.

8. RESERVED

9. FOR SPACE CONDITIONING SYSTEM ZONES SERVING ONLY SPACES THAT ARE REQUIRED TO HAVE OCCUPANT SENSING CONTROLS SHALL BE CONTROLLED BY OCCUPANCY SENSING CONTROLS.

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
This document is used to demonstrate compliance with requirements in 110.9, 130.0, 130.2, 140.7, and 141.0(b)2L for outdoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e)6, 180.1(a) and 180.2(b)4Bv for outdoor lighting scopes using the prescriptive path for multifamily and mixed-use occupancies. Multifamily includes dormitory and senior living facilities.		
Project Name: YOLO COUNTY AG DEPARTMENT SHOPS BUILDING	**Report Page:**	**(Page 1 of 8)**
Project Address: 120 W. MAIN STREET, WOODLAND, 95695	**Date Prepared:**	2024-08-20T13:55:22-04:00

A. GENERAL INFORMATION

01	Project Location (city)	WOODLAND	04	Total Illuminated Hardscape Area (ft²)	33500
02	Climate Zone	12			
03	Outdoor Lighting Zone per Title 24 Part 1	10.114 or as designated by Authority Having Jurisdiction (AHJ):			
☐ LZ-0: Very Low - Undeveloped Parkland	☐ LZ-2: Moderate - Urban Clusters	☐ LZ-4: High - Must be reviewed by CA Energy Commission for Approval			
☐ LZ-1: Low - Rural Areas	☒ LZ-3: Moderately High - Urban Areas				
05	Occupancy Types within Project				
● Office ● Parking Garage ● Warehouse					

B. PROJECT SCOPE

This table includes outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv for alterations.

My Project Consists of:

01	02		
☒ New Lighting System	Must Comply with Allowances from 140.7 / 170.2(e)6		
☐ Altered Lighting System	Is your alteration increasing the connected lighting load (Watts)?	○ Yes	○ No
03	04	05	
% of Existing Luminaires Being Altered[1]	Sum Total of Luminaires Being Added or Altered	Calculation Method	
☐ < 10% ☐ >= 10% and < 50% ☐ >= 50%			

Please proceed to Table F. Outdoor Lighting Fixture Schedule to define the project's luminaires.

[1] *FOOTNOTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100.*

STATE OF CALIFORNIA
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CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
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C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through N. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

Calculations of Total Allowed Lighting Power (Watts) 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv											Compliance Results			
01		02		03		04		05		06		07		08	09
General Hardscape Allowance 140.7(d)1 / 170.2(e)6 (See Table I)	+	Per Application 140.7(d)2 / 170.2(e)6 (See Table J)	+	Sales Frontage 140.7(d)2 (See Table K)	+	Ornamental 140.7(d)2 / 170.2(e)6 (See Table L)	+	Per Specific Area 140.7(d)2 / 170.2(e)6 (See Table M)	OR	Existing Power Allowance 141.0(b)2L / 180.2(b)4Bv (See Table N)	=	**Total Allowed** (Watts)	≥	**Total Actual** (Watts)	**07 must be >= 08**
1,340.3	+	---	+	---	+	---	+	---	OR	---	=	1,340.3	≥	1,154	COMPLIES
										Shielding Compliance (See Table G for Details)					COMPLIES
										Controls Compliance (See Table H for Details)					COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

STATE OF CALIFORNIA
Outdoor Lighting
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CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
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F. OUTDOOR LIGHTING FIXTURE SCHEDULE

For new or altered lighting systems demonstrating compliance with 140.7 / 170.2(e)6 all new luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application are included in the Table below. For altered lighting systems using the Existing Power method per 141.0(b)2L only new luminaires being installed and replacement luminaires being installed as part of the project scope are included (ie, existing luminaires remaining or existing luminaires being moved are not included). Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

Designed Wattage:

01	02		03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description		Watts per luminaire[1, 2]	How is Wattage determined	Total Number Luminaires[2]	Luminaire Status[3]	Excluded per 140.7(a) / 170.2(e)6A	Design Watts	Cutoff Req. > 6,200 initial lumen output 130.2(b) / 160.5(c)[4]	Field Inspector	
										Pass	Fail
P	LED POLE LIGHT	☐ Linear	220	Mfr. Spec	2	New	☐	440	Provided	☐	☐
W	LED WALL PACK	☐ Linear	72	Mfr. Spec	7	New	☐	504	Provided	☐	☐
W2	LED WALL PACK	☐ Linear	30	Mfr. Spec	7	New	☐	210	NA: < 6200 lumens	☐	☐
							Total Design Watts:	1154			

* NOTES: Selections with a * require a note in the space below explaining how compliance is achieved.
EX: Luminaire is lighting a statue; EXCEPTION 2 to 130.2(b)

[1] *FOOTNOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b)*
[2] *For linear luminaires, wattage should be indicated as W/lf instead of Watts/luminaire. Total linear feet should be indicated in column 05 instead of number of luminaires.*
[3] *Select "New" for new luminaires in a new outdoor lighting project, or for added luminaires in an alteration. Select "Altered" for replacement luminaires in an alteration. Select "Existing to Remain" for existing luminaires within the project scope that are not being altered and are remaining. Select "Existing Reinstalled" for existing luminaires which are being removed and reinstalled as part of the project scope.*
[4] *Compliance with mandatory shielding requirements is required for luminaires with initial lumen output >= 6,200 unless exempted by 130.2(b)/ 160.5(c)*

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G. SHIELDING REQUIREMENTS (BUG)

This table includes fixtures of >=6,200 initial lumens indicated on Table F as needing to comply with Shielding Requirements. Maximum lumens can be found in Title 24, Part 11, Section 5.106.8.

01	02	03			04	05	06	07	08	09	10	11	12
Name or Item Tag	Complete Luminaire Description	Backlight Rating[2]			Uplight Rating[2]					Glare Rating (Lumens)[2]			Field Inspector
		Mounting Height[1]	Max Allowable Backlight Rating[3]	Backlight Rating Per Design	Lighting type	Max Allowable Uplight Rating[3]	Uplight Rating Per Design			Mounting Height[1]	Max Allowable Glare Rating[3]	Glare Rating Per Design	Pass / Fail
P	LED POLE LIGHT	2 MH from property line	No Limit	B2	Area Lighting	U0	U0			> 2 MH from property line	G3	G3	☐ ☐
W	LED WALL PACK	2 MH from property line	No Limit	B0	Area Lighting	U0	U0			> 2 MH from property line	G3	G3	☐ ☐

[1] *FOOTNOTES: Mounting Height is labeled MH in this table.*
[2] *Authority Having Jurisdiction may ask for Luminaire cut sheets or other documentation to confirm luminaire type, uplight ratings and glare ratings used for compliance per 130.2(b)/ 160.5(c)*
[3] *BUG ratings with a lower number than the 'Max Allowable' are compliant. Ex. If Max Allowable is Bug Rating B4, then B0, B1, B2 and B3 are all compliant.*

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H. OUTDOOR LIGHTING CONTROLS

This table demonstrates compliance with controls requirements for all new or altered luminaires installed as part of the permit application. For alteration projects, luminaires which are existing to remain (ie untouched) and luminaires which are removed and reinstalled (wiring only) do not need to be included in this table even if they are within the spaces covered by the permit application.
Outdoor lighting for nonresidential buildings, parking garages and common service areas in multifamily buildings must be documented separately from outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit

Mandatory Controls for Nonresidential Occupancies, Parking Garages & Common Areas in Multifamily Buildings

01	02	03	04	05	
Area Description	Shut-Off 130.2(c)1 / 160.5(c)	Auto-Schedule 130.2(c)2 / 160.5(c)	Motion Sensor 130.2(c)3 / 160.5(c)	Field Inspector	
				Pass	Fail
PARKING LOT: "W"	Astronomical Timer	Provided	Provided	☐	☐
PARKING LOT: "P"	Astronomical Timer	Provided	Provided	☐	☐
MECHANICAL YARD: "W2"	Astronomical Timer	Provided	NA: Each Luminaire <= 40 Watts	☐	☐

[1] *FOOTNOTE: Text has been abbreviated, please refer to Table 160.5-A to confirm compliance with the specific light source technologies listed.*
[2] *Authority having jurisdiction may ask for cutsheets or other documentation to confirm compliance of light source.*
[3] *Recessed luminaires marked for use in fire-rated installations, and recessed luminaires installed in non-insulated ceilings are excepted from ii and iii.*

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I. LIGHTING POWER ALLOWANCE (per 140.7 / 170.2(e))

This table includes areas using allowance calculations per 140.7 / 170.2(e). General Hardscape Allowance is per Table 140.7-A/Table 170.2-R while "Use it or lose it" Allowances are per Table 140.7-B /Table 170.2-S. Indicate which allowances are being used to expand sections for user input. Luminaires that qualify for one of the "Use it or lose it" allowances shall not qualify for another "Use it or lose it" allowance.
Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

01				
	"Use it or lose it" Allowance (select all that apply) (select all that apply)			
☒ General Hardscape Allowance Table I (below)	☐ Per Application Table J	☐ Sales Frontage Table K	☐ Ornamental Table L	☐ Per Specific Area Table M

Calculated General Hardscape Lighting Power Allowance per Table 140.7-A for Nonresidential & Hotel/Motel

02	03	04	05	06	07	08	09
Area Description	Area Wattage Allowance (AWA)			Linear Wattage Allowance (LWA)			Total General AWA + LWA (Watts)
	Illuminated Area (ft²)	Allowed Density (W/ft²)	Area Allowance (Watts)	Perimeter Length (lf)	Allowed Density (W/lf)	Linear Allowance (Watts)	
PARKING LOT	35000	0.021	735	1043	0.2	208.6	943.6
MECHANICAL YARD	3500	0.021	73.5	366	0.2	73.2	146.7
						Initial Wattage Allowance for Entire Site (Watts):	250
						Instances of Initial Wattage Allowance (LZ 0 only)[1]	
						Total General Hardscape Allowance (Watts):	1340.3

J. LIGHTING ALLOWANCE: PER APPLICATION

This section does not apply to this project.

K. LIGHTING ALLOWANCE: SALES FRONTAGE

This section does not apply to this project.

L. LIGHTING ALLOWANCE: ORNAMENTAL

This section does not apply to this project.

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JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA
TITLE 24 COMPLIANCE FORMS

REVISIONS:

	DATE	DESCRIPTION
3	07/29/24	ALL ELECTRIC

DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E0.4 3
OF - **SHEETS**

STATE OF CALIFORNIA
Outdoor Lighting
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M. LIGHTING ALLOWANCE: PER SPECIFIC AREA

This section does not apply to this project.

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)

This section does not apply to this project.

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTO-E - Must be submitted for all buildings

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTO-02-A - Must be submitted for all outdoor lighting controls except for alterations where controls are added to <= 20 luminaires.	PARKING LOT: "W"; PARKING LOT: "P"; MECHANICAL YARD: "W2"

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CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: YOLO COUNTY AG DEPARTMENT SHOPS BUILDING	**Report Page:**	**(Page 8 of 8)**
Project Address: 120 W. MAIN STREET, WOODLAND, 95695	**Date Prepared:**	2024-08-20T13:55:22-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: BEN SCHLENKER	Documentation Author Signature:
Company: ECOM Engineering Inc.	Signature Date: 08-20-2024
Address: 1455 RESPONSE ROAD, SUITE 140	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: SACRAMENTO, CA 95815	Phone: (916) 641-5600

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: BEN SCHLENKER	Responsible Designer Signature:
Company: ECOM Engineering Inc.	Date Signed: 08-20-2024
Address: 1455 RESPONSE ROAD, SUITE 140	License: 021982
City/State/Zip: SACRAMENTO, CA 95815	Phone: (916) 641-5600

CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance
Generated Date/Time:
Report Version: 2022.0.000
Schema Version: rev 20220101
Documentation Software: Energy Code Ace
Compliance ID: 220128-0824-0012
Report Generated: 2024-08-20 10:55:24

Outdoor Lighting Mandatory Measures:

110.9 OUTDOOR LIGHTING CONTROLS AND COMPONENTS
ALL LIGHTING CONTROL DEVICES AND SYSTEMS, AND ALL LIGHT SOURCES SHALL MEET THE APPLICABLE REQUIREMENTS OF 110.9.

130.0 GENERAL LUMINAIRE REQUIREMENTS
ALL LUMINAIRES SHALL BE FACTORY-LABELLED PER 130.0(c).
ENERGY MANAGEMENT CONTROL SYSTEMS (EMCS) SHALL MEET REQUIREMENTS OF 130.0(e).

130.2(b) LUMINAIRE SHIELDING REQUIREMENTS
ALL OUTDOOR LUMINAIRES WITH INITIAL LUMINAIRE LUMENS >=6,200 SHALL COMPLY WITH THE BACKLIGHT, UPLIGHT AND GLARE (BUG) REQUIREMENTS OF TITLE 24, PART 11, SECTION 5.106.8.

130.2(c) CONTROLS FOR OUTDOOR LIGHTING
ALL OUTDOOR LIGHTING SHALL BE INDEPENDENTLY CONTROLLED FROM OTHER ELECTRICAL LOADS AND SHALL HAVE THE FOLLOWING FEATURES:

1. AUTOMATICALLY TURNS OFF OUTDOOR LIGHTING WHEN DAYLIGHT IS AVAILABLE

2. AUTOMATIC SCHEDULING CONTROLS
   - A. AUTOMATIC SCHEDULING CONTROLS SHALL BE INSTALLED FOR ALL OUTDOOR LIGHTING.
   - B. CAPABLE OF REDUCING LIGHTING POWER AT LEAST 50% AND NO MORE THAN 90% AND SEPARATELY CAPABLE OF TURNING LIGHTING OFF DURING UNOCCUPIED PERIODS
   - C. THAT ALLOW SCHEDULING OF AT LEAST TWO NIGHTTIME PERIODS WITH INDEPENDENT LIGHTING LEVELS (MAY INCLUDE OVERRIDE FOR NO MORE THAN 2 HOURS)

3. MOTION SENSING CONTROLS
   - A. SHALL BE INSTALLED FOR THE FOLLOWING AND MAY BE INSTALLED FOR OTHER OUTDOOR LIGHTING AND IN COMBINATION WITH OTHER OUTDOOR LIGHTING CONTROLS:
     (i) ORNAMENTAL HARDSCAPE, OUTDOOR DINING, OR OUTDOOR SALES FRONTAGE LIGHTING MOUNTED 24 FT ABOVE GRADE OR LOWER
     (ii)WALL MOUNTED LUMINAIRES INSTALLED FOR BUILDING FACADE, ORNAMENTAL HARDSCAPE, OUTDOOR DINING LIGHTING THAT HAVE A BILATERALLY SYMMETRIC DISTRIBUTION (AS DESCRIBED IN THE IES HANDBOOK) MOUNTED 24 FEET OR LESS ABOVE GRADE
   - B. CAPABLE OF REDUCING LIGHTING POWER AT LEAST 50% AND NO MORE THAN 90% AND SEPARATELY CAPABLE OF TURNING LIGHTING OFF DURING UNOCCUPIED PERIODS
   - C. CAPABLE OF DIMMING OR TURNING OFF LIGHTING NO LONGER THAN 15 MINUTES AFTER AREA IS VACATED AND TURNING LIGHTING ON WHEN AREA BECOMES OCCUPIED
   - D. SINGLE SENSORS CAN CONTROL NO MORE THAN 1,500 WATTS OF LIGHTING POWER

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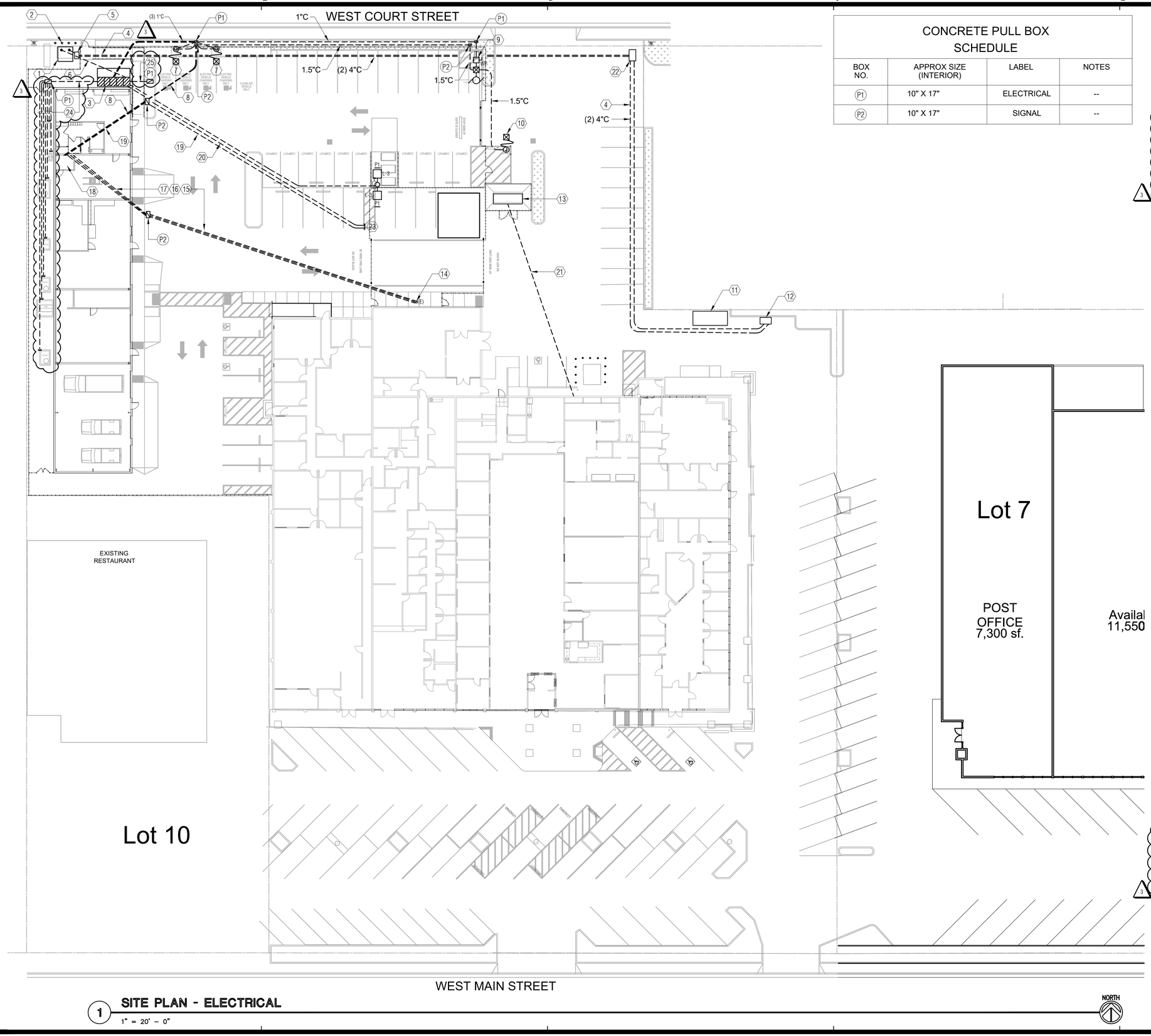
OF - SHEETS



CONCRETE PULL BOX SCHEDULE

BOX NO.	APPROX SIZE (INTERIOR)	LABEL	NOTES
P1	10" X 17"	ELECTRICAL	--
P2	10" X 17"	SIGNAL	--

SHEET NOTES

1. ALL ELECTRICAL UTILITY INSTALLATIONS SHALL BE COORDINATED WITH PG&E COMMITMENT DRAWINGS AND COMMERCIAL CONSTRUCTION SPECIFICATIONS.
2. TYPICAL - ALL SITE CONDUITS SHALL BE 1" MINIMUM UNLESS OTHERWISE NOTED.
3. ALL CONDUITS ENTERING AND EXITING THE MAIN SWITCHBOARD SHALL BE FROM UNDERGROUND.
4. CONTRACTOR TO ARRANGE FOR INSPECTION OF UNDERGROUND ELECTRICAL PRIOR TO COVER (TABLE 300.5)
5. ALL UNDERGROUND RACEWAYS MUST COMPLY WITH RACEWAY SEAL REQUIREMENTS PER 2022 CEC - ARTICLE 300.5.

NUMBERED NOTES

1. NEW UTILITY PAD MOUNTED TRANSFORMER. INSTALL PER UTILITY COMPANY REQUIREMENTS.
2. PROVIDE BOLLARD PROTECTION PER PG&E REQUIREMENTS.
3. NEW MAIN SERVICE SWITCHBOARD 'MSB'.
4. PRIMARY SERVICE CONDUITS. COORDINATE WITH PG&E.
5. UTILITY PRIMARY PULL BOX. COORDINATE REQUIREMENTS AND LOCATION WITH UTILITY COMMITMENT DRAWINGS.
6. SECONDARY SERVICE CONDUITS. COORDINATE WITH PG&E.
7. 208V, DUAL CORD, LEVEL II EV CHARGING STATION.
8. QTY (2) 1.5" CONDUITS FOR LOW VOLTAGE CABLING.
9. MOTORIZED GATE. CONFIRM VOLTAGE PRIOR TO CONNECTION.
10. CARD READER FOR GATE ACCESS.
11. EXISTING PG&E VAULT.
12. EXISTING PG&E SPLICE VAULT 3' X 5'.
13. EXISTING EMERGENCY GENERATOR.
14. EXISTING TELECOMMUNICATIONS PULL BOX AND CONDUIT STUBS.
15. QTY (1) 2" HDPE CONDUIT CONTAINING 12 STRANDS OF SINGLE-MODE FIBER AND 12 STRANDS OF 50 MICRON MULTI-MODE FIBER.
16. QTY (1) 2" HDPE CONDUIT CONTAING 25 PAIR TWISTED SHIELD COPPER.
17. QTY (1) 2" SPARE HDPE CONDUIT.
18. NEW TELECOM EQUIPMENT CLOSET.
19. 1.5" CONDUIT FOR FUTURE AUTO GATE LOW VOLTAGE CABLING.
20. 1" CONDUIT FOR FUTURE AUTO GATE POWER CONDUCTORS.
21. EXISTING BELOW GRADE CONDUIT BANK.
22. NEW PG&E SPLICE VAULT 3'X5' TRAFFIC RATED. EXACT LOCATION AND REQUIREMENTS PER PG&E DRAWINGS.
23. CONDUIT STUBS BELOW GRADE FOR FUTURE AUTO GATE.
24. (7) 1"CONDUITS FOR MECHANICAL EQUIPMENT. SEE E2.0 FOR ADDITIONAL INFORMATION. PROVIDE (1) ADDITIONAL SPARE 1"CONDUIT FROM 'MSB' TO PULL BOX.
25. PROVIDE (2) SPARE 1" CONDUITS FROM 'MSB' SECTIONS 'L', 'R', & 'M' EACH. (6) TOTAL

1 SITE PLAN - ELECTRICAL
1" = 20' - 0"

NORTH

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JOB NO. 22-Q153.00 PM. BS
DESIGNERS BS
DRAWN BY ECOM

PROFESSIONAL ENGINEER
BENJAMIN SCHLENKER
No. E 021982
Exp. 9/30/25
ELECTRICAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA
SITE PLAN - ELECTRICAL

REVISIONS:

	DATE	DESCRIPTION
1	07/29/24	ALL ELECTRIC

DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E1.0
OF - SHEETS

SHEET NOTES

1. TYPICAL - EXHAUST FANS SHOWN ON THIS SHEET ARE LOCATED ON ROOF ABOVE. COORDINATE LOCATIONS WITH MECHANICAL.
2. PROVIDE UN-SWITCHED 'HOT' CONDUCTOR TO ALL BATTERY BACK-UP LIGHT FIXTURES.
3. ALL CONDUITS ENTERING AND EXITING THE MAIN SWITCHBOARD SHALL BE FROM UNDERGROUND.
4. PROVIDE DEDICATED CONDUIT HOMERUN FOR MECHANICAL EQUIPMENT AS INDICATED.
5. CONTRACTOR TO ARRANGE FOR INSPECTION OF UNDERGROUND ELECTRICAL PRIOR TO COVER (TABLE 300.5)
6. ALL UNDERGROUND RACEWAYS MUST COMPLY WITH RACEWAY SEAL REQUIREMENTS PER 2022 CEC - ARTICLE 300.5.
7. ALL SITE AND UNDERGROUND CONDUITS SHALL BE 1" MINIMUM.
8. SEE DETAIL 4/E6.0 FOR BRANCH CIRCUIT WIRING DIAGRAM.

NUMBERED NOTES

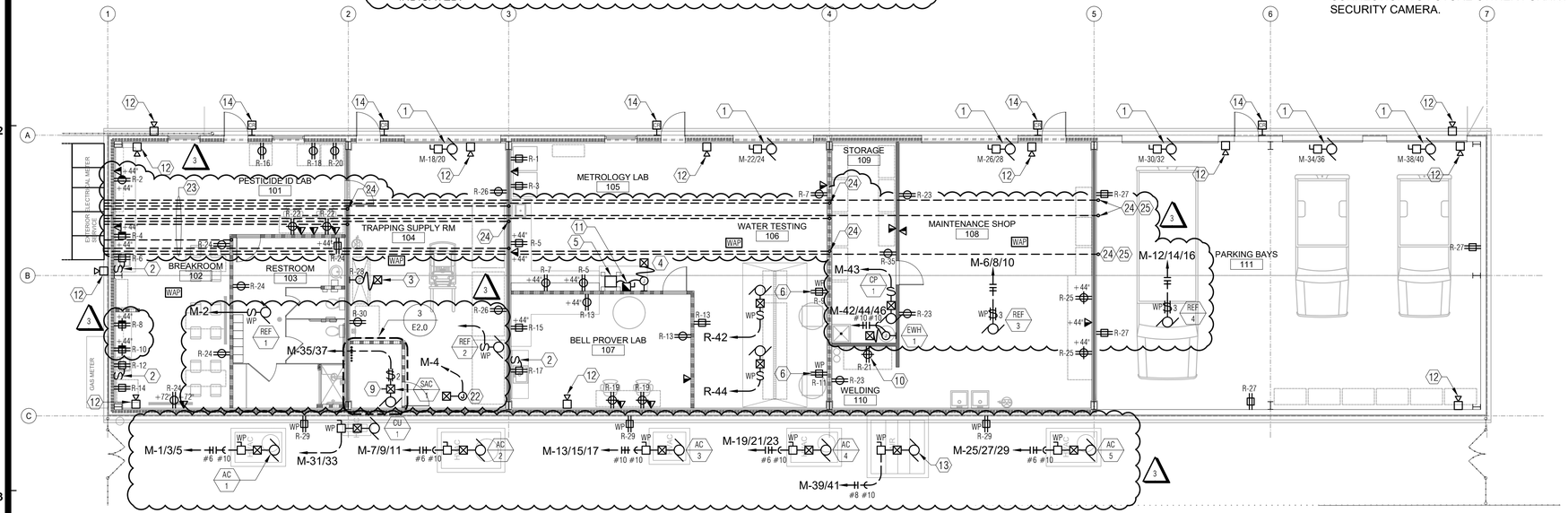
1. ROLL UP DOOR, 208V.
2. PROVIDE TOGGLE SWITCH FOR GARBAGE DISPOSAL. LOCATE ABOVE COUNTER.
3. FUME HOOD, 120V.
4. ELECTRICAL METER TEST STATION, 120/240V, 1PH.
5. 15 KVA TRANSFORMER, 208-120/240V, 1PH, 3W. MOUNT UNDER WORK BENCH.
6. PROVIDE WITH IN-USE TYPE WATER PROOF COVER.

NUMBERED NOTES

7. PROVIDE 3/4" FIRE RATED PLYWOOD ON ALL TELECOM ROOM WALLS.
8. TELECOMMUNICATIONS GROUND BAR (TGB).
9. PROVIDE 3/4" CONDUIT WITH CONTROL WIRING TO OUTDOOR CONDENSER UNIT.
10. WELDING RECEPTACLE, 120V.
11. TRANSFORMER SECONDARY DISCONNECT SWITCH. LOCATE ABOVE WORKBENCH.
12. PROVIDE DATA CABLE ABOVE CEILING FOR CONNECTION TO FUTURE OWNER FURNISHED SECURITY CAMERA.

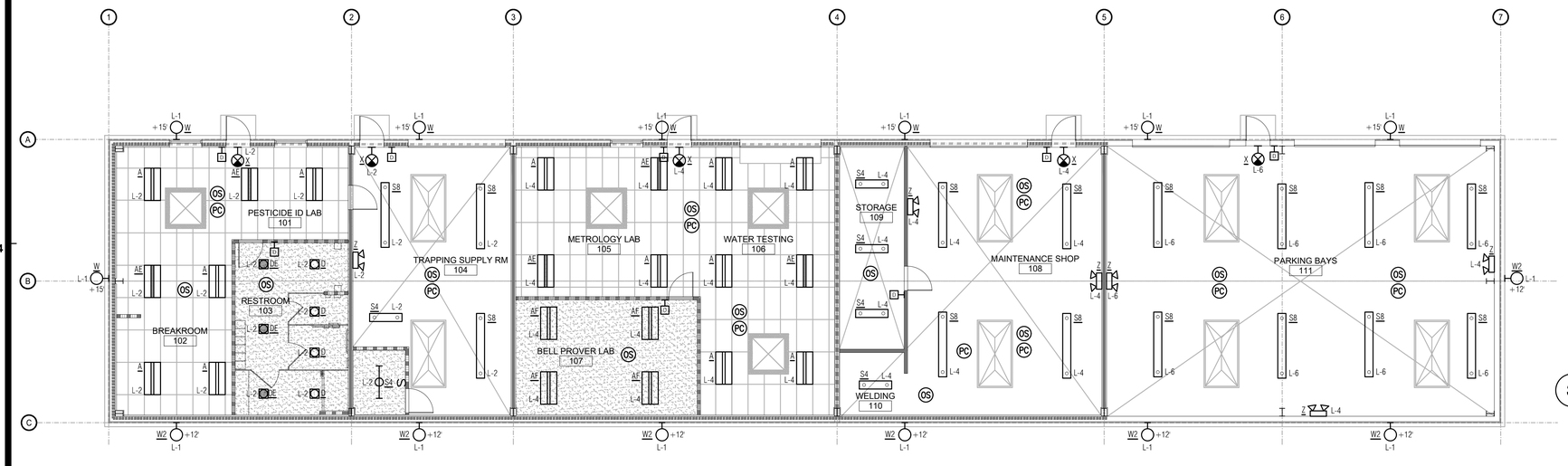
NUMBERED NOTES

13. OWNER FURNISHED AIR COMPRESSOR, 5HP, 240V, 1PH.
14. FUTURE OWNER FURNISHED CARD READER. CONTRACTOR TO PROVIDE ROUGH-IN ONLY. REFER TO DETAIL 3 ON SHEET E6.4.
15. 84" H, 2 POST TELECOMMUNICATIONS SERVER RACK.
16. 84" H, 6" W, VERTICAL WIRE MANAGER
17. 12" W, CABLE LADDER.
18. PROVIDE MINIMUM OF (2) SERIES 44 EZ PATHS.
19. DEDICATED OUTLET FOR FUTURE SECURITY CABINET.
20. DEDICATED OUTLET FOR FUTURE ACCESS CONTROL CABINET.
21. DEDICATED OUTLET FOR FUTURE FIRE ALARM CABINET.
22. PROVIDE BRANCH CIRCUIT FOR AC-2 CONTROL DAMPERS, 120V. COORDINATED WITH MECHANICAL.
23. TYPICAL - CONTRACTOR SHALL PROVIDE BELOW SLAB CONDUIT HOMERUNS TO 'MSB' FOR BRANCH CIRCUITS. CONTRACTOR SHALL PROVIDE CONDUITS FROM EACH RESPECTIVE 'MSB' DISTRIBUTION SECTION STUBBED INTO FINISHED WALLS. LAYOUT PROVIDED ON PLAN SHALL SERVE AS A BASIS OF DESIGN ONLY. CONTRACTOR SHALL PROVIDE SUBMITTAL DOCUMENTATION FOR REVIEW AND APPROVAL OF EXACT CONDUIT SIZE, QUANTITY, AND ROUTING. PROVIDE MINIMUM (3) SPARE 1" CONDUIT FROM 'MSB' SECTIONS 'L', 'R', & 'M' EACH.
24. TYPICAL - EXTEND CONDUIT HOMERUN TO ABOVE FINISHED CEILING AND PROVIDE PULL BOX FOR EXTENDING BRANCH CIRCUITS TO DEVICES AS INDICATED.
25. EXTEND SURFACE MOUNT CONDUIT ON WALL TO OVERHEAD AND PROVIDE PULL BOX FOR EXTENDING BRANCH CIRCUITS. COORDINATE EXACT STUB UP LOCATION WITH ARCHITECT AND OWNER.



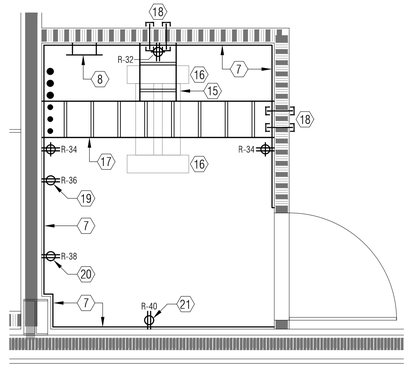
1 ENLARGED AG SHOP FLOOR PLAN - POWER & SIGNAL

1/8" = 1' - 0"



2 ENLARGED AG SHOP REFLECTED CEILING PLAN - LIGHTING

1/8" = 1' - 0"



3 IT 104A - POWER, EQUIPMENT & LADDER RACK

1/2" = 1' - 0"

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ELECTRICAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

ENLARGED AG SHOP - POWER & SIGNAL AND LIGHTING

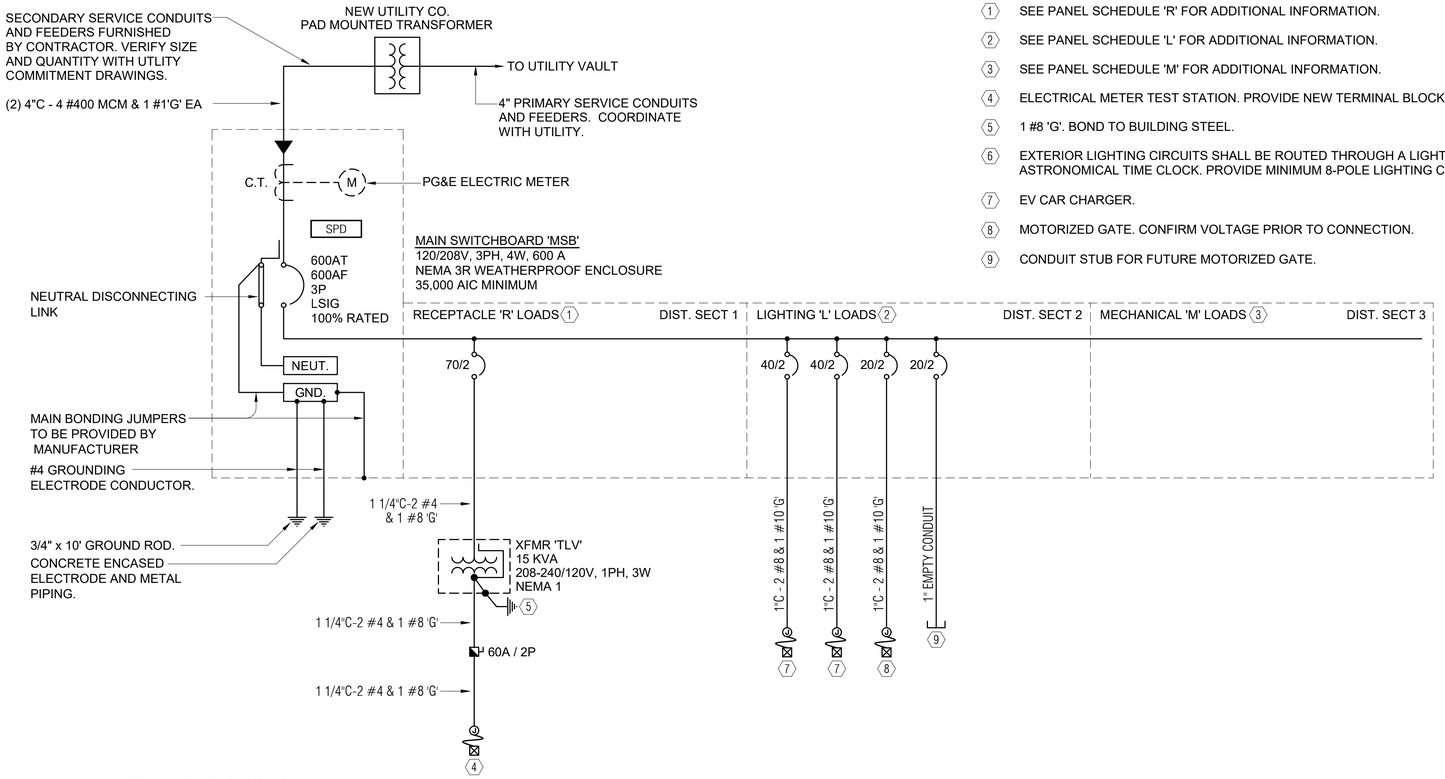
REVISIONS:

	DATE	DESCRIPTION
3	07/29/24	ALL ELECTRIC

DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E2.0
OF - SHEETS

NUMBERED NOTES

1. SEE PANEL SCHEDULE 'R' FOR ADDITIONAL INFORMATION.
2. SEE PANEL SCHEDULE 'L' FOR ADDITIONAL INFORMATION.
3. SEE PANEL SCHEDULE 'M' FOR ADDITIONAL INFORMATION.
4. ELECTRICAL METER TEST STATION. PROVIDE NEW TERMINAL BLOCK.
5. 1 #8 'G'. BOND TO BUILDING STEEL.
6. EXTERIOR LIGHTING CIRCUITS SHALL BE ROUTED THROUGH A LIGHTING CONTACTOR WITH ASTRONOMICAL TIME CLOCK. PROVIDE MINIMUM 8-POLE LIGHTING CONTACTOR.
7. EV CAR CHARGER.
8. MOTORIZED GATE. CONFIRM VOLTAGE PRIOR TO CONNECTION.
9. CONDUIT STUB FOR FUTURE MOTORIZED GATE.



1 ONE LINE DIAGRAM

NO SCALE

PROJECT: YOLO COUNTY AG SHOP — NEW

LOCATION: MSB

PANEL - M

LOAD DESCRIPTION	KVA LOAD CONT.	RECP.	MOTOR	NON	C. B. TRIP	POLE	CKT #	PH A	B	C	CKT #	C. B. TRIP	POLE	KVA LOAD CONT.	RECP.	MOTOR	NON	LOAD DESCRIPTION	
---			5.04		---			*			2	15	1			0.24		REF-1	2
3 AC-1			5.04		50	3	3		*		4	15	1			0.24		REF-2	4
---			5.04		---					*		---				0.42			---
---			5.28		---			*			8	15	3			0.42		REF-3	8
9 AC-2			5.28		50	3	9		*			---				0.42			---
---			5.28		---			*				---				0.42			---
---			2.76		---			*			14	15	3			0.42		REF-4	14
15 AC-3			2.76		30	3	15	*				---				0.42			---
---			2.76		---					*	18	20	2			1.20		AUTO DOOR	18
---			5.04		---			*				---				1.20			---
21 AC-4			5.04		50	3	21		*		22	20	2			1.20		AUTO DOOR	22
---			5.04		---			*				---				1.20			---
---			5.04		---					*	26	20	2			1.20		AUTO DOOR	26
27 AC-5			5.04		50	3	27	*				---				1.20			---
---			5.04		---				*		30	20	2			1.20		AUTO DOOR	30
31 CU-1			1.50		20	2	31	*				---				1.20			---
---			1.50		---				*		34	20	2			1.20		AUTO DOOR	34
35 SAC-1			1.25		20	2	35	*				---				1.20			---
---			1.25		---				*		38	20	2			1.20		AUTO DOOR	38
39 AIR COMPRESSOR			2.34		60	2	39	*				---				1.20			---
---			2.34		---				*			---					3.00		---
43 CP-1			0.09		20	1	43	*			44	30	3				3.00	EWH	44
45 SPACE							45	*				---					3.00		---
47 SPACE							47		*		48							SPACE	48
49 SPACE							49	*			50							SPACE	50
51 SPACE							51		*		52							SPACE	52
53 SPACE							53			*	54							SPACE	54
55 SPACE							55	*			56							SPACE	56
57 SPACE							57		*		58							SPACE	58
59 SPACE							59			*	60							SPACE	60
TOTALS ---------->			79.75													17.40	9.00	<-------- TOTALS	

LOAD SUMMATION

VOLTAGE: 120/208V, 3 PH, 4W
AIC: 35,000
MOUNTING: SURFACE
BUSING: 600 AMP BUSING
MAIN: MAIN LUGS ONLY

CONNECT LOAD (KVA)		DEMAND FACTOR		DEMAND LOAD (KVA)		
	x	125% OF LOAD	=		<--	CONTINUOUS
	x	CEC DEMAND	=		<--	RECEPTACLES
97.15	x	1.00	=	101.11	<--	MOTORS+25% LARGEST
9.00	x	1.00	=	9.00	<--	NONCONTINUOUS
106.15	kVA	294.86	Amps	110.11	kVA	305.86 Amps

ADDITIONAL FEATURES:

LARGEST MOTOR LOAD (kVA) = 15.84

8/28/24

PROJECT: YOLO COUNTY AG SHOP — NEW

LOCATION: MSB

PANEL - MSB

LOAD DESCRIPTION	KVA LOAD CONT.	RECP.	MOTOR	NON	C. B. TRIP	POLE	CKT #	PH A	B	C	CKT #	C. B. TRIP	POLE	KVA LOAD CONT.	RECP.	MOTOR	NON	LOAD DESCRIPTION	
---		3.06	2.02	4.70	---		2				40	2	3.12					EV CAR CHARGER	2
3 SECTION 'R'		2.52		4.70	3	3		*				---	3.12						---
---		2.52	1.08	5.10	---		6		*		40	2	3.12					EV CAR CHARGER	6
---	1.73			---						*		---	3.12						---
9 SECTION 'L'	1.68			---	3	9		*			10	20	2			1.66		MOTORIZED GATE	10
---	1.14			---	---		10		*			---				1.66			---
---			31.88	3.00	---		14	*			20	2						SPARE (FUTURE MOTORIZED GATE)	14
15 SECTION 'M'			32.88	3.00	3	15			*			---							---
---			32.39	3.00	---		18	*			70	2				3.60		SPARE (LT)	18
19						19	*					---				3.60			---
21						21		*	22										22
23						23			*	24									24
25						25	*			26									26
27						27		*	28										28
29						29			*	30									30
31						31	*			32									32
33						33		*	34										34
35						35			*	36									36
37						37	*			38									38
39						39		*	40										40
41						41			*	42									42
TOTALS ---------->	4.55	8.10	100.25	23.50										12.48		3.32	7.20	<-------- TOTALS	

LOAD SUMMATION

VOLTAGE: 120/208V, 3 PH, 4W
AIC: 35,000
MOUNTING: SURFACE
BUSING: 600 AMP BUSING
MAIN: MAIN LUGS ONLY

CONNECT LOAD (KVA)		DEMAND FACTOR		DEMAND LOAD (KVA)		
17.03	x	125% OF LOAD	=	21.28	<--	CONTINUOUS
8.10	x	CEC DEMAND	=	8.10	<--	RECEPTACLES
103.57	x	1.00	=	108.09	<--	MOTORS+25% LARGEST
30.70	x	1.00	=	30.70	<--	NONCONTINUOUS
159.40	kVA	442.77	Amps	168.17	kVA	467.14 Amps

ADDITIONAL FEATURES:

NEMA 3R ENCLOSURE

CEC 220.44 DEMAND: 1st 10 kVA AT 100%, REMAINING AT 50%

LARGEST MOTOR LOAD (kVA) = 18.07

8/28/24

PROJECT: YOLO COUNTY AG SHOP — NEW

LOCATION: MSB

PANEL - R

LOAD DESCRIPTION	KVA LOAD CONT.	RECP.	MOTOR	NON	C. B. TRIP	POLE	CKT #	PH A	B	C	CKT #	C. B. TRIP	POLE	KVA LOAD CONT.	RECP.	MOTOR	NON	LOAD DESCRIPTION	
1 METRO LAB FREEZER				1.20	20	1	1	*			2	20	1		0.18			BREAK RM RECEPT.	2
3 METRO LAB REFRIG.				1.00	20	1	3		*		4	20	1		0.18			BREAK RM RECEPT.	4
5 METRO LAB RECEPTS.		0.36			20	1	5	*			6	20	1				0.80	BREAK RM GARB DISP.	6
7 METRO LAB RECEPTS.		0.36			20	1	7	*			8	20	1				1.00	BREAK RM MICROWAVE	8
9 WATER TEST RECEPTS.		0.18			20	1	9	*			10	20	1		0.18			BREAK RM RECEPT.	10
11 WATER TEST RECEPTS.		0.18			20	1	11	*			12	20	1				0.80	BREAK RM GARB DISP.	12
13 BELL LAB RECEPTS.		0.36			20	1	13	*			14	20	1				1.00	BREAK RM REFRIG.	14
15 BELL LAB RECEPTS.		0.18			20	1	15	*			16	20	1				1.00	LAB REFRIG.	16
17 BELL LAB GARB DISP.				0.80	20	1	17		*		18	20	1				1.00	LAB REFRIG.	18
19 BELL LAB RECEPTS.		0.72			20	1	19	*			20	20	1				1.00	LAB REFRIG.	20
21 WELDER RECEPTS.				1.20	20	1	21		*		22	20	1		0.36			LAB RECEPTS.	22
23 WELDER RECEPTS.		0.54			20	1	23		*		24	20	1		0.90			BREAK RM RECEPTS.	24
25 MAINT SHOP RECEPTS.		0.72			20	1	25	*			26	20	1		0.36			TRAP RM RECEPTS.	26
27 PARKING BAY RECEPTS.		0.72			20	1	27	*			28	20	1				1.00	TRAP RM FUME HOOD	28
29 EXTERIOR RECEPTS		0.54			20	1	29		*		30	15	1				1.20	TRAP RM ICE MACHINE	30
31 SPARE					20	1	31	*			32	20	1		0.36			IT RECEPT.	32
33 SPARE					20	1	33		*		34	20	1		0.72			IT RECEPT.	34
35 SPARE					20	1	35	*			36	20	1				0.50	FUTURE SECURITY CAB	36
37 SPARE					20	1	37	*			38	20	1				0.50	FUTURE ACCESS CTRL CAB	38
39 SPARE					20	1	39	*			40	20	1				0.50	FURTURE FA CTRL CAB	40
41 SPARE					20	1	41	*			42	20	1			1.08		WATER TEST PUMP	42
43 SPARE					20	1	43	*			44	40	1			2.02		WATER TEST PUMP	44
45 SPARE					20	1	45	*				---							---
---					---					*	48	30	3					SPARE	48
49 SPACE (RESERVE FOR FUTURE)					3		49	*				---							---
---					---						52		1					SPACE	52
53 SPACE					1		53		*		54		1					SPACE	54
55 SPACE					1		55	*			56		1					SPACE	56
57 SPACE					1		57		*		58		1					SPACE	58
59 SPACE					1		59			*	60		1					SPACE	60
TOTALS ---------->		4.86		4.20											3.24	3.10	10.30	<-------- TOTALS	

LOAD SUMMATION

VOLTAGE: 120/208V, 3 PH, 4W
AIC: 35,000
MOUNTING: SURFACE
BUSING: 600 AMP BUSING
MAIN: MAIN LUGS ONLY

CONNECT LOAD (KVA)		DEMAND FACTOR		DEMAND LOAD (KVA)		
	x	125% OF LOAD	=		<--	CONTINUOUS
8.10	x	CEC DEMAND	=	8.10	<--	RECEPTACLES
3.10	x	1.00	=	3.60	<--	MOTORS+25% LARGEST
14.50	x	1.00	=	14.50	<--	NONCONTINUOUS
25.70	kVA	71.39	Amps	26.20	kVA	72.79 Amps

ADDITIONAL FEATURES:

CEC 220.44 DEMAND: 1st 10 kVA AT 100%, REMAINING AT 50%

LARGEST MOTOR LOAD (kVA) = 2.02

8/28/24

PROJECT: YOLO COUNTY AG SHOP — NEW

LOCATION: MSB

PANEL - L

LOAD DESCRIPTION	KVA LOAD CONT.	RECP.	MOTOR	NON	C. B. TRIP	POLE	CKT #	PH A	B	C	CKT #	C. B. TRIP	POLE	KVA LOAD CONT.	RECP.	MOTOR	NON	LOAD DESCRIPTION	
1 EXTERIOR BUILDING LIGHTS	0.87				20	1	1	*			2	20	1	0.86				BRK RM, LAB, TRAP LTS	2
3 PARKING LOT POLE LIGHTS	0.44				20	1	3		*		4	20	1	1.24				LAB & MAINT. SHOP LTS	4
5 RESERVE FOR LTG CONTACTOR					20	1	5			*	6	20	1	1.14				PARKING BAYS LTS	6
7 RESERVE FOR LTG CONTACTOR					20	1	7	*			8	20	1					SPARE	8
9 RESERVE FOR LTG CONTACTOR					20	1	9		*		10	20	1					SPARE	10
11 RESERVE FOR LTG CONTACTOR					20	1	11			*	12	20	1					SPARE	12
13 RESERVE FOR LTG CONTACTOR					20	1	13	*			14							SPACE	14
15 RESERVE FOR LTG CONTACTOR					20	1	15		*		16							SPACE	16
17 SPARE					20	1	17	*			18							SPACE	18
19 SPARE					20	1	19		*		20							SPACE	20
21 SPARE					20	1	21			*	22							SPACE	22
23 SPARE					20	1	23	*			24							SPACE	24
TOTALS ---------->	1.31													3.24				<-------- TOTALS	

LOAD SUMMATION

VOLTAGE: 120/208V, 3 PH, 4W
AIC: 35,000
MOUNTING: SURFACE
BUSING: 600 AMP BUSING
MAIN: MAIN LUGS ONLY

CONNECT LOAD (KVA)		DEMAND FACTOR		DEMAND LOAD (KVA)		
4.55	x	125% OF LOAD	=	5.68	<--	CONTINUOUS
	x	CEC DEMAND	=		<--	RECEPTACLES
	x	1.00	=		<--	MOTORS+25% LARGEST
	x	1.00	=		<--	NONCONTINUOUS
4.55	kVA	12.63	Amps	5.68	kVA	15.78 Amps

ADDITIONAL FEATURES:

8/28/24

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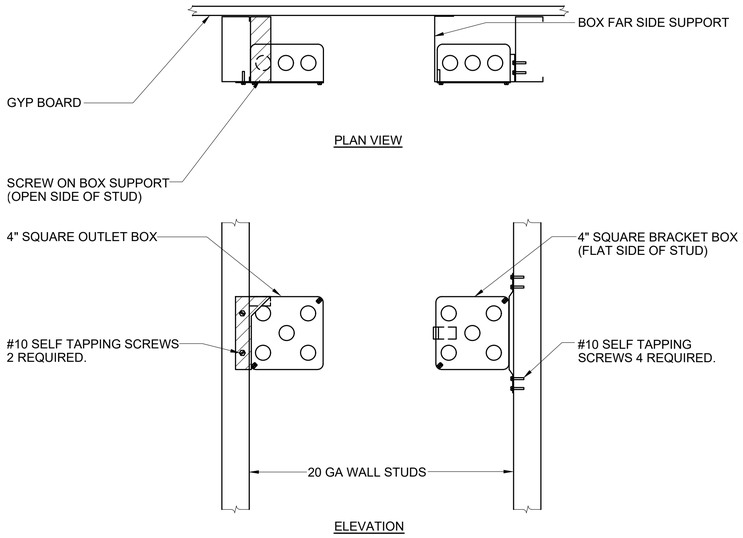
JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA
ONE LINE DIAGRAM AND LOAD CALCS

REVISIONS:

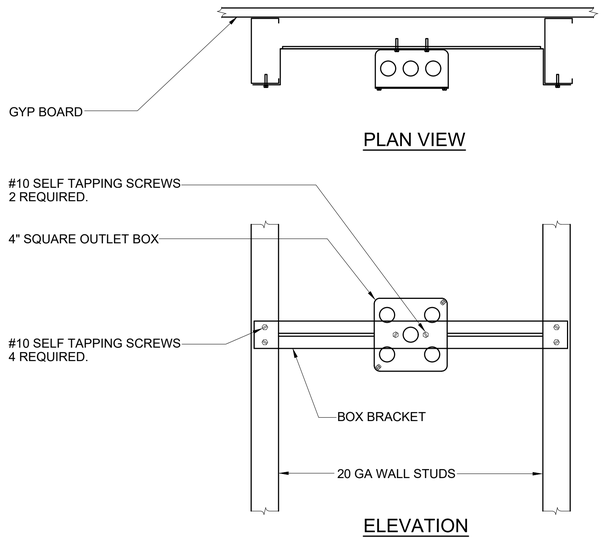
	DATE	DESCRIPTION
1	07/29/24	ALL ELECTRIC

DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E5.0
OF - SHEETS



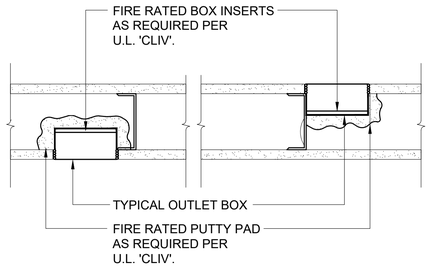
1 BOX SUPPORT (ON STUD)

NO SCALE



2 BOX SUPPORT (BETWEEN STUDS)

NO SCALE

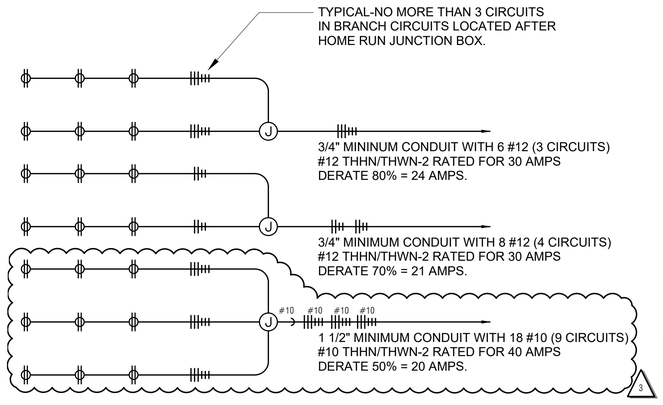


NOTES:

1. SPACE OUTLET BOXES 24" APART WHEN POSSIBLE.
2. BACK TO BACK BOXES PER U.L. CLIV LISTING.
3. PLUG ALL UNUSED KNOCK-OUTS IN OUTLET BOXES WITH KNOCK-OUT CAPS.
4. FIRE RATED WALL ASSEMBLIES PER CBC 713.3.
5. PENETRATION ASSEMBLY SHALL MEET SPECIFIC REQUIREMENTS FOR LABORATORY TESTED ASSEMBLY USED. SEE DETAIL 2 ON SHEET E902 FOR U.L. LISTING 'CLIV'.

3 OUTLET TREATMENT FOR 1-H FIRE RATED PARTITION

NO SCALE



4 20 AMP SINGLE POLE BRANCH CIRCUIT WIRING DIAGRAM

NO SCALE

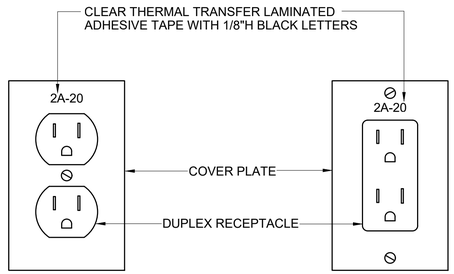
GENERAL NOTES

WIRING DIAGRAM REPRESENTS THE MAXIMUM NUMBER OF CONDUCTORS ALLOWED IN A 20 AMP 120 VOLT BRANCH CIRCUIT HOME RUN.

BRANCH CIRCUIT HOME RUNS SHALL NOT EXCEED THE NUMBER OF CONDUCTORS SHOWN IN THIS DIAGRAM.

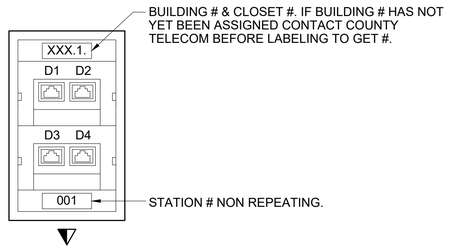
REFER TO POWER PLANS FOR BRANCH CIRCUIT HOME RUNS OTHER THAN 20 AMP SINGLE POLE.

PROVIDE A SEPARATE NEUTRAL FOR EACH PHASE CONDUCTOR.



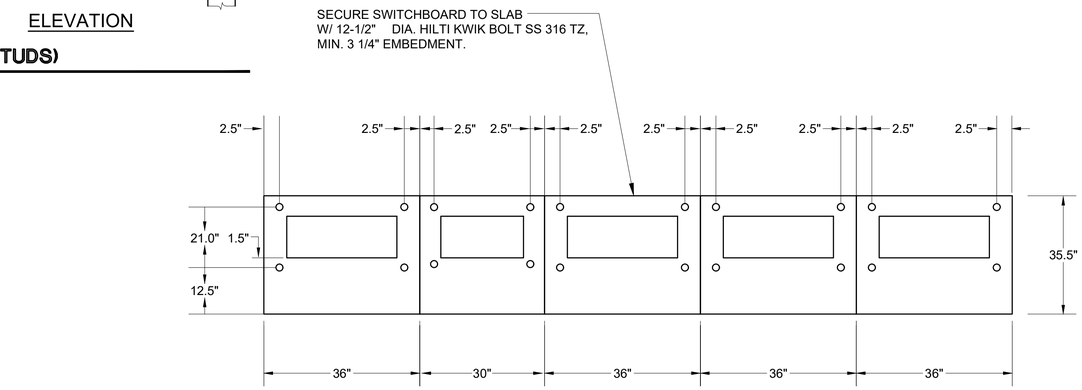
5 OUTLET DESIGNATION DETAIL

NO SCALE



6 DATA OUTLET DESIGNATION DETAIL

NO SCALE



NOTES:

1. USE FENDER WASHERS ON ALL SCREWS.
2. USE 3000 PSI CONCRETE.
3. COMPACT SOIL BELOW PAD AND AROUND.

PROVIDE CONCRETE PAD
EXTENDING 4" BEYOND ALL SIDES
OF EQUIPMENT, WITH 6x6/10x10 REINF.
MESH THRU CENTER OF PAD.

7 SWITCHBOARD 'MSB' ELEVATION

NO SCALE

ECOM
ENGINEERING
1455 Response Road, Suite 140
Sacramento, CA. 95815
916.641.5600
916.641.1640 fax
www.ecomeng.com

JOB NO. 22-Q153.00 PM. BS
DESIGNERS BS
DRAWN BY ECOM

PROFESSIONAL ENGINEER
REGISTERED
BENJAMIN SCHLENKER
No. E 021982
Exp. 9/30/25
ELECTRICAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA
ELECTRICAL DETAILS

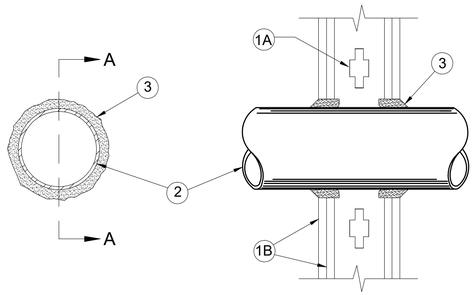
REVISIONS:

	DATE	DESCRIPTION
1	07/29/24	ALL ELECTRIC

DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E6.0
OF - SHEETS

THROUGH-PENETRATION FIRESTOP SYSTEMS (GYPSUM)

SYSTEM NO. W-L-1001
JUNE 15, 2005
F RATINGS - 1, 2, 3 AND 4 HR (SEE ITEMS 2 AND 3)
T RATINGS - 0, 1, 2, 3 AND 4 HR (SEE ITEM 3)
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - LESS THAN 1 CFM/SQ FT



SECTION A-A

1. WALL ASSEMBLY- THE 1, 2, 3 OR 4 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAX 2HR FIRE RATED ASSEMBLIES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC WITH NOM 2 BY 4 IN. LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN. 3-5/8 IN. WIDE BY 1-3/8 IN. DEEP CHANNELS SPACED MAX. 24 IN. OC.

   B. GYPSUM BOARD*- NOM 1/2 OR 5/8 IN. THICK, 4 FT. WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTNER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM. OF OPENING IS 26 IN.

2. THROUGH PENETRANT - ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRE STOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN. O IN. TO MAX. 2 IN. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED.
   A. STEEL PIPE - NOM 24 IN. DIAM. (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. IRON PIPE - NOM 24 IN. DIAM. (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. DIAM. (OR SMALLER) OR CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE.
   C. CONDUIT - NOM 6 IN. DIAM. (OR SMALLER) STEEL CONDUIT OR NOM 4 IN. DIAM. (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.
   D. COPPER TUBING - NOM 6 IN. DIAM. (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   E. COPPER PIPE - NOM 6 IN. DIAM. (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
   F. FILL PENETRATION PRODUCT* - FLEXIBLE METAL PIPING - THE FOLLOWING TYPES OF STEEL

   METAL GAS PIPING MAY BE USED:
   1. NOM 2 IN. DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. OMEGA FLEX INC.
   2. NOM 1 IN. DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. TITEFLEX CORP. A BUDDY CO.
   3. NOM 1 IN. DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. WARD MFG INC.

3. FILL, VOID OR CAVITY MATERIAL* - CAULK OR SEALANT - MIN 5/8, 1-1/4, 1-7/8 AND 2-1/2 IN. THICKNESS OF CAULK FOR 1, 2, 3, 4 HR RATED ASSEMBLIES, RESPECTIVELY, APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 1/4 IN. DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATIONS ON BOTH SIDE OF WALL. THE HOURLY F RATING OF THE FIRE STOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING IF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW.

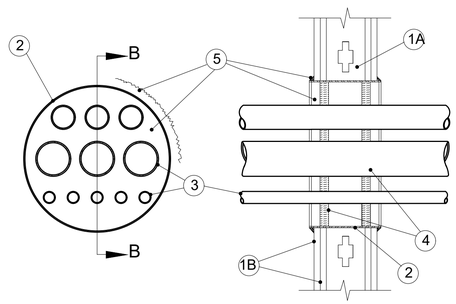
MAX PIPE OR CONDUIT DIA. IN. (mm)	F RATING HR	T RATING HR
1 (25)	1 OR 2	0+, 1 OR 2
1 (25)	3 OR 4	3 OR 4
4 (102)	1 OR 2	0
6 (152)	3 OR 4	0
12 (305)	1 OR 2	0

+WHEN COPPER IS USED, T RATING IS 0 HR.
3M COMPANY - CP 25WB+ CAULK OR FB-3000WT SEALANT,
*BEARING THE UL CLASSIFICATION MARKING

1 GYPSUM WALL FIRE PENETRATION DETAIL

NO SCALE

SYSTEM NO. W-L-1016
(FORMERLY SYSTEM NO. 322)
F RATING-- 2 HR
T RATINGS--1, 1-1/2 AND 2 HR (SEE ITEM 3)
L RATING AT AMBIENT--2 CFM/sq ft
L RATING AT 400° F--LESS THAN 1 CFM/sq ft



SECTION B-B

1. WALL ASSEMBLY - THE FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC WITH NOM 2 BY 4 IN. LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. WIDE BY 1-3/8 IN DEEP CHANNELS SPACED MAX 24 IN. OC.
   B. GYPSUM BOARD* - TWO LAYERS OF NOM 5/8 IN. THICK GYPSUM WALLBOARD AS SPECIFIED IN THE INDIVIDUAL WALL OR PARTITION DESIGN. MAX DIAM OF THROUGH OPENINGS CUT IN WALLBOARD LAYERS IS 12 IN. MAX DIMENSIONS FOR RECTANGULAR OPENING IS 12 IN. BY 9 IN.
   C. FASTENERS - WHEN WOOD STUD FRAMING IS EMPLOYED, GYPSUM WALLBOARD ATTACHED TO STUDS WITH CEMENT COATED NAILS AS SPECIFIED IN THE INDIVIDUAL U300-SERIES DESIGN. WHEN STEEL CHANNEL STUD FRAMING IS EMPLOYED, GYPSUM WALLBOARD ATTACHED TO STUDS WITH TYPE S SELF-DRILLING, SELF-TAPPING BUGLE-HEAD STEEL SCREWS AS SPECIFIED IN THE INDIVIDUAL U400-SERIES DESIGN.

2. STEEL SLEEVE - NO. 28 GAUGE GALV SHEET STEEL FORMED INTO MAX 12 IN. DIAM OR MAX 12 IN. BY 9 IN. SLEEVE WITH NOM 2 IN. OVERLAP AT SEAM. LENGTH OF SLEEVE TO BE APPROX 1 IN. GREATER THAN OVERALL THICKNESS OF WALL ASSEMBLY, SUCH THAT, WHEN INSTALLED, THE ENDS OF THE SLEEVE WILL PROJECT APPROX 1/2 IN. BEYOND THE SURFACE OF THE WALL ON BOTH SIDES OF THE WALL ASSEMBLY. MAX DIAM OF CIRCULAR THROUGH OPENINGS IN GYPSUM WALLBOARD LAYERS ON EACH SIDE OF WALL ASSEMBLY TO BE 12 IN. MAX DIMENSIONS FOR RECTANGULAR OPENING IS 12 IN. BY 9 IN. SLEEVE INSTALLED BY COILING THE SHEET STEEL TO A DIAM SMALLER THAN THE THROUGH OPENING, INSERTING THE COIL THROUGH THE OPENINGS AND RELEASING THE COIL TO LET IT UNCOIL AGAINST THE CIRCULAR CUTOUTS IN THE GYPSUM WALLBOARD LAYERS.

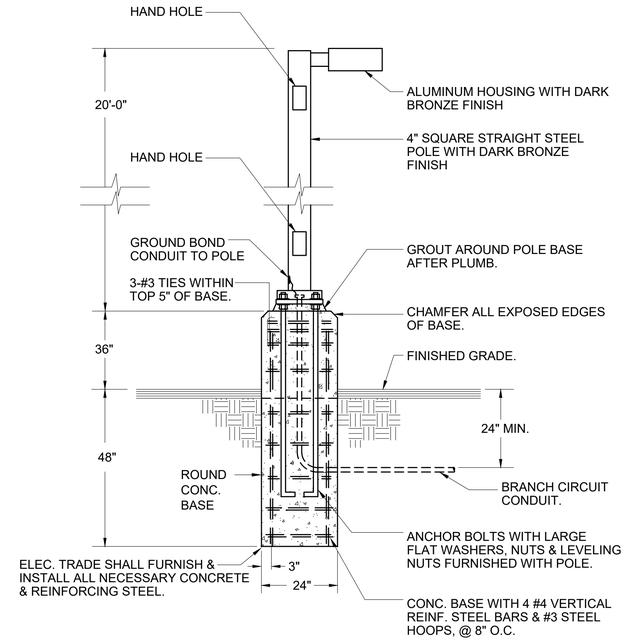
3. STEEL PIPE OR CONDUIT - NOM 3 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE, STEEL CONDUIT OR STEEL ELECTRICAL METALLIC TUBING. MULTIPLE PIPES AND/OR CONDUIT PERMITTED IN SLEEVED OPENING PROVIDED A MIN SEPARATION OF 1/4 IN. IS MAINTAINED BETWEEN PIPES OR CONDUITS. PIPES AND/OR CONDUITS TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF THE WALL ASSEMBLY. THE T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE MAX DIAM OF THE PIPES OR CONDUITS, AS TABULATED BELOW:

4. PACKING MATERIAL - MIN 1 IN. THICKNESS OF RIGID GLASS FIBER INSULATION OR MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO STEEL SLEEVE ON BOTH SIDES OF WALL ASSEMBLY AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED MIN 5/8 IN. FROM SURFACE OF WALL ON BOTH SIDES OF WALL ASSEMBLY.

5. FILL,VOID OR CAVITY MATERIALS* - CAULK - APPLIED TO FILL THE STEEL SLEEVE TO A MIN DEPTH OF 1 IN. ON BOTH SIDES OF WALL ASSEMBLY. A NOM 1/4 IN. DIAM CONTINUOUS BEAD OF CAULK SHALL BE APPLIED AROUND THE CIRCUMFERENCE OF THE STEEL SLEEVE AT ITS EGRESS FROM THE GYPSUM WALLBOARD LAYERS ON BOTH SIDES OF THE WALL ASSEMBLY.
MINNESOTA MINING & MFG CO - TYPE CP 25WB+.

*BEARING THE UL CLASSIFICATION MARKING

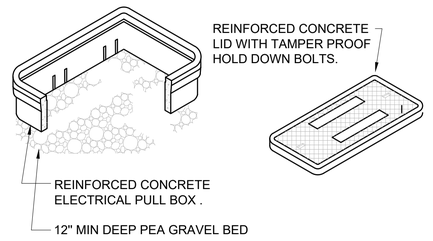
MAX PIPE OR CONDUIT DIA. IN.	T RATING HR
3	1
1	1 1/2
3/4	2



NOTE: CONCRETE BASE SHALL HAVE A 3000 PSI MINIMUM 28 DAY COMPRESSIVE STRENGTH.

3 POLE LIGHT DETAIL WITH ROUND BASE

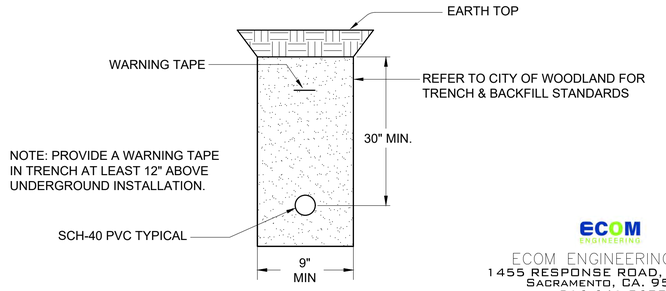
NO SCALE



A HIGH DENSITY REINFORCED CONCRETE PULL AND JUNCTION BOX WITH END AND SIDE KNOCKOUTS. NON-SETTLING SHOULDERS MAINTAIN GRADE AND FACILITATE BACK FILLING. APPROXIMATE DIMENSIONS SHOWN. PROVIDE 12" OF PEA GRAVEL BENEATH PULLBOX FOR DRAINAGE.

4 PULL BOX DETAIL

NO SCALE



5 UNDERGROUND CONDUIT TRENCH DETAIL

NO SCALE

ECOM ENGINEERING
ECOM ENGINEERING INC.
1455 RESPONSE ROAD, SUITE 140
SACRAMENTO, CA, 95815
916.641.5600
916.641.1640 FAX
WWW.ECOMENG.COM

JOB NO. 22-Q153.00 PM. BS
DRAWN BY ECOM

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN SCHLENKER
No. E 021982
Exp. 9/30/25
ELECTRICAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

ELECTRICAL DETAILS

REVISIONS:

	DATE:	DESCRIPTION:
△		
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△		
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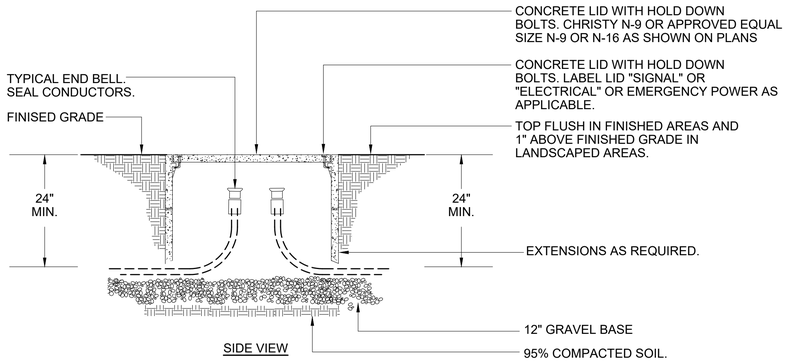
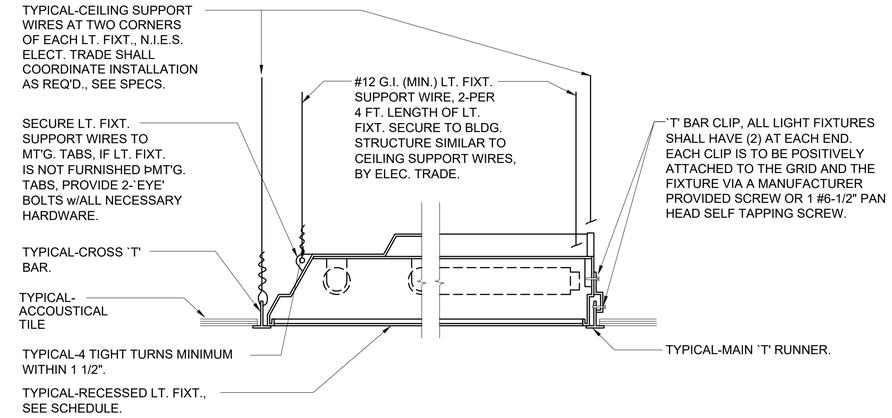
DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E6.1
OF - SHEETS



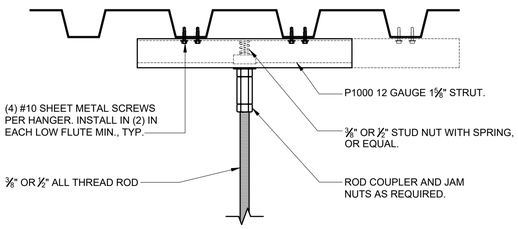
1 PULL BOX DETAIL

NOT AT SCALE



2 TYPICAL - RECESSED 'T' BAR LIGHT FIXTURE MOUNTING DETAIL

NO SCALE

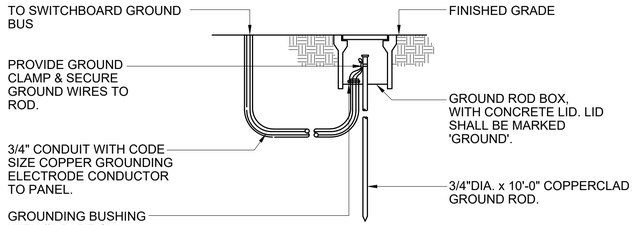


NOTES:

1. USE IN METAL DECK WITHOUT CONCRETE FILL FOR LOADS NOT TO EXCEED 75 LBS. AS SHOWN PERPENDICULAR TO A MINIMUM OF (2) FLUTES.
2. INSTALLING PARALLEL TO A SINGLE FLUTE IS ACCEPTABLE FOR LOADS NOT TO EXCEED 50 LBS. ATTACH WITH #10 SHEET METAL SCREWS AT 6" ON CENTER MINIMUM.
3. AT SLOPED ROOF LOCATIONS USE COOPER B-LINE SWIVEL HANGER MODEL B446, SQUARE WASHER, JAM NUTS AND COUPLER, OR EQUAL. TYPICAL AT SLOPED ROOF LOCATIONS.
4. SCREWS SHALL ONLY BE USED IN THE LOW FLUTE AS SHOWN.
5. ACCEPTABLE TO USE DUCT STRAP TO STRUT, USE 3/8"Ø BOLT AND SPRING NUT TO SECURE STRAP TO STRUT.
6. SUPPORT ASSEMBLY SHALL NOT BE SPACED WITHIN 2'-0" OF EACH OTHER SPANNING THE SAME FLUTES.

3 UPPER ATTACHEMENT SUPPORT DETAIL

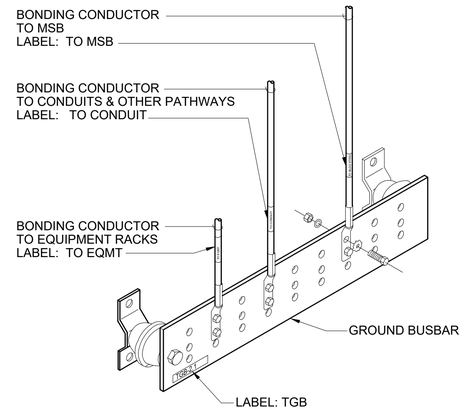
NO SCALE (TYPICAL OF METAL DECK WITHOUT CONCRETE FILL)



NOTE:
PROVIDE SUPPLEMENTAL GROUNDING ELECTRODE PER CEC 250.53(A)(2) OR PROVIDE RESISTANCE TEST IN THE PRESENCE OF FIELD INSPECTOR CONFIRMING 25 OHMS OR LESS RESISTANCE.

4 GROUND ROD BOX DETAIL

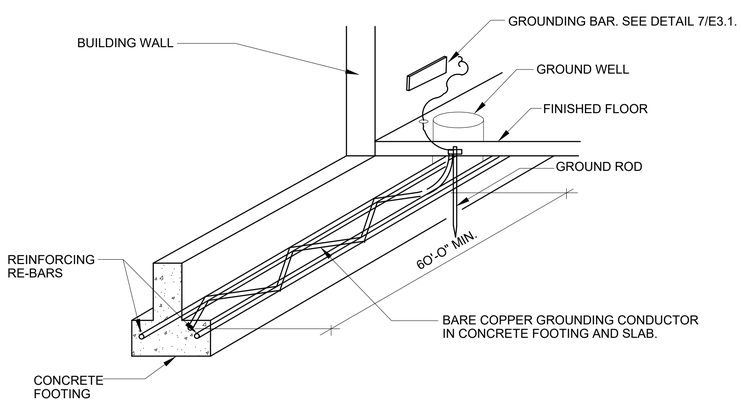
NO SCALE



NOTES: REFER TO ROOM PLANS FOR BUSBAR MOUNTING LOCATION.

5 TELECOM GROUND BUSBAR DETAIL

NO SCALE



6 UFER GROUND DETAIL

NO SCALE

ECOM ENGINEERING INC.
1455 RESPONSE ROAD, SUITE 140
SACRAMENTO, CA. 95815
916.641.5600
916.641.1640 FAX
WWW.ECOMENG.COM

JOB NO. 22-Q153.00 PM. BS
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REGISTERED PROFESSIONAL ENGINEER
BENJAMIN SCHLENKER
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120 W. MAIN STREET
WOODLAND, CA
ELECTRICAL DETAILS

REVISIONS:

	DATE:	DESCRIPTION:
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△		
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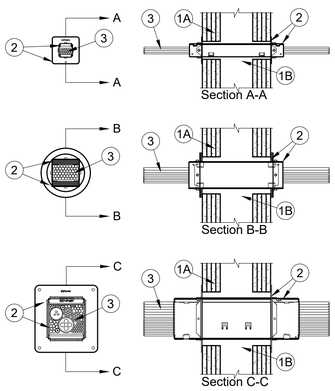
△		
△		

DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E6.2
OF - SHEETS

System No. W-L-3377
F Ratings - 1, 2, 3 and 4 Hr (See Item 1)
T Ratings - 0, 1/2, 3/4, 1, 1-1/2 and 2 Hr (See Item 3)
L Rating At Ambient - Less Than 1 to 7.4 (See Item 2)
L Rating At 400 F - Less Than 1 to 6.7 (See Item 2)



1. Wall Assembly - The 1, 2, 3 or 4 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, U400 or V400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:

   A. Studs - Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.

   B. Gypsum Board* - Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. See Table for opening sizes.

   The hourly F Rating of the firestop system is dependent upon the hourly rating of the wall in which it is installed.

2. Firestop Device* - Series 22 EZ Path device modules consist of a 1.4 by 1.4 by 10-1/2 in. (36 by 36 by 267 mm) long galv steel tube with an intumescent material lining. Series 33 EZ Path device modules consist of a 3 by 3 by 10-1/2 in. (76 by 76 by 267 mm) long galv steel tube with an intumescent material lining. Series 44 and Series 44+ EZ Path device modules consist of a 4 by 4-5/8 by 14 in. (102 by 118 by 356 mm) long galv steel tube with an intumescent material lining. Firestop device modules to be installed in accordance with the accompanying installation instructions. Firestop device modules secured in place by means of steel wall plates installed with gasketing material supplied with product. Steel wall plates installed on both sides of wall and secured to each device by means of steel screws provided with device. Firestop device module is to be installed with ends projecting an equal distance beyond each surface of the wall assembly. The annular space between the device and opening shall be min 0 in. (point contact) to max 1/8 in. (3 mm) for Series 22 device, max 1/2 in. (13 mm) for Series 33 device and max 1/4 in. (6 mm) for Series 44 device. The opening size and L Ratings for each device vary according to whether device module is blank (no cables) or loaded (with cables) and which cable type and size is used, as tabulated below:

Device	Cable Fill	Cable Sleeve	L-Rating (CFM)		Opening Size Diam or Dimensions, in. (mm)
			Ambient	400° F	
Series 22	0%	-	1.4	1.4	2 (51) or 1-3/4 x 1-3/4 (44 x 44)
Series 22	100%	3A	Less Than 1	Less Than 1	2 (51) or 1-3/4 x 1-3/4 (44 x 44)
Series 22	100%	3F	Less Than 1	Less Than 1	2 (51) or 1-3/4 x 1-3/4 (44 x 44)
Series 33	0%	-	Less Than 1	Less Than 1	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 33	100%	3A	4	3	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 33	100%	3F	1.3	Less Than 1	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 33	100%	3G, 3H	7	2	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 33	100%	3J	1.8	1.8	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 44	0%	-	2.5	2.5	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 44	100%	3A	7.4	5	6 (152) or 4-1/8 x 4-3/4 (120 x 120)
Series 44	100%	3F, 3G	6.2	4.5	6 (152) or 4-1/8 x 4-3/4 (120 x 120)
Series 44+	0%	-	Less Than 1	Less Than 1	4 (102) or 3-1/4 x 3-1/4 (82 x 82)
Series 44+	100%	3A	7.4	5	6 (152) or 4-1/8 x 4-3/4 (120 x 120)
Series 44+	100%	3F, 3G	6.7	6.7	6 (152) or 4-1/8 x 4-3/4 (120 x 120)

SPECIFIED TECHNOLOGIES ING EZ PATH Series 22, 33, 44 or 44+ Fire Rated Pathway

2A. Firestop Device* - Extension Module - (Optional, Not Shown) - Module attached to ends of Series 33, Series 44 or Series 44+ firestop device (Item 2) to increase its length to facilitate installation in thicker walls. Each module consists of a galv steel tube with an intumescent material lining. Extension module to be installed in accordance with the accompanying installation instructions. When module is used, firestop device (Item 2) and extension module(s) secured in place by means of steel wall plates installed with gasketing material supplied with product. Steel wall plates installed on both sides of wall and secured to each device or extension module(s) by means of steel set screws provided with wall plates. Firestop device and extension module(s) assembly to be installed with ends projecting an equal distance beyond each surface of the wall assembly.

SPECIFIED TECHNOLOGIES ING EZ PATH Series 33 or Series 44+ Extension

3. Cables - Within the loading area for the firestop device module, the loose or grouped cables may represent a 0 to 100 percent visual fill. Cables to be rigidly supported on both sides of the wall assembly. Any combination of the following types of cables may be used:

   A. Max 400 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) or plenum-rated jacketing and insulation.

   B. Max 750 kcmil single copper conductor power cable with XLPE jacket and insulation

   C. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.

   D. Max 3/C No. 2/0 AWG metal clad or armored cable with steel or aluminum jacket.

   E. Max 3/C No. 8 AWG NM cable (Romex) with PVC insulation and jacket.

   F. Max four pair No. 22 AWG (or smaller) copper conductor data cable with PVC or plenum rated jacketing and insulation.

   G. Coaxial cable with fluorinated ethylene or PVC insulation and jacketing having a max diam of 5/8 in. (16 mm).

   H. Optical fiber cable with PVC or polyethylene (PE) jacket and insulation and having a max diam of 5/8 in. (16 mm).

   I. Optical Fiber Raceway+ - Max 1-1/2 in. (38 mm) diam (or smaller) optical fiber raceway ("innerduct") formed of either PVC or polyvinylidene fluoride (PVDF) with optical fiber cable fill. Raceways installed in accordance with the National Electrical Code (NFPA 70).

   J. Max RG6/U coaxial cable with fluorinated ethylene, polyethylene (PE), PVC or plenum rated jacketing and insulation.

When Series 22 EZ Path device modules are used and when the hourly rating of the wall assembly is 1 hr, the T Rating is 3/4 hr except that for Items 3F, 3G and 3H, the T Rating is 1 hr. When the hourly fire rating of the wall assembly is 2 hr or greater, the T Rating is 3/4 hr when cables are installed. When no cables are installed within the device module, the T Rating is 1 hr in 1 hr walls and 1-1/2 hr for 2, 3 and 4 hr walls. When Item 3A, 3B, 3C, 3D or 3E is used, the maximum F Rating is 2 hr. When max 200 pair No. 24 AWG telecommunication cable and/or 350 kcmil power cable is used or when Item 3F, 3G, 3H or 3I is used, the maximum F Rating is 4 hr.

When Series 33 EZ Path device modules are used and when the hourly rating of the wall assembly is 1 hr, the T Rating is 3/4 hr. When the hourly fire rating of the wall assembly is greater than 1 hr, the T Rating is 3/4 hr when Item 3A, 3B, 3C, 3D or 3E is used. Otherwise the T Rating is 1 hr. When Item 3A, 3B, 3C, 3D or 3E is used, the maximum F Rating is 2 hr. When max 200 pair No. 24 AWG telecommunication cable is used or when Item 3F, 3G, 3H or 3I is used, the maximum F Rating is 4 hr.

When Series 44 EZ Path device modules are used and when Item 3A, 3B, 3C, 3D or 3E is used, the max F Rating is 3 hr. When Item 3F, 3G, 3H or 3I is used, the max F Rating is 4 hr. When cable fill within the device is min 0 percent (empty) to max 20 percent, the T Rating is 0 Hr. When cable fill within the device is greater than 20 percent, the T Rating is 1/2 Hr.

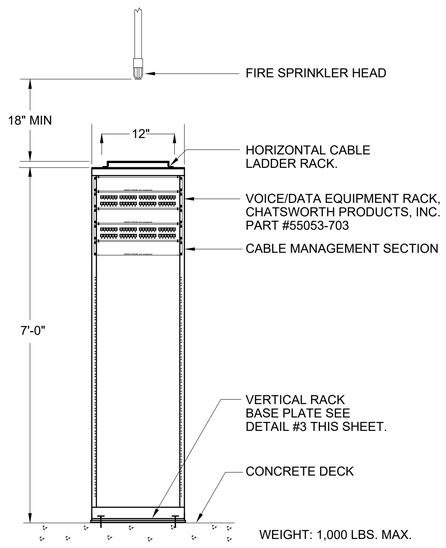
When Series 44 + EZ Path device modules are used and when Item 3A, 3B, 3C, 3D or 3E is used, the max F Rating is 3 hr and the T Rating is 1 hr. When Item 3F or 3G is used, the max F Rating is 4 hr and the T Rating is 1-1/2 hr. When Item 3H is used, the max F Rating is 4 hr and the T Rating is 2 hr. When Item 3I is used, the max F Rating is 4 hr and the T Rating is 3/4 hr. When device empty, the T Rating is 1-1/2 Hr.

+Bearing the UL Listing Mark

*Bearing the UL Classification Mark

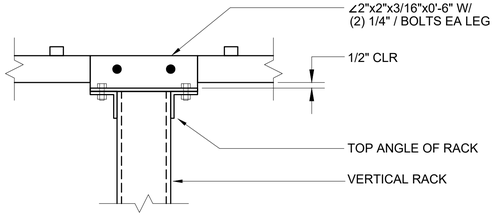
X EZ PATH SERIES 22, 33 AND 44 FIRE RATED PATHWAY - WL 3377

NO SCALE

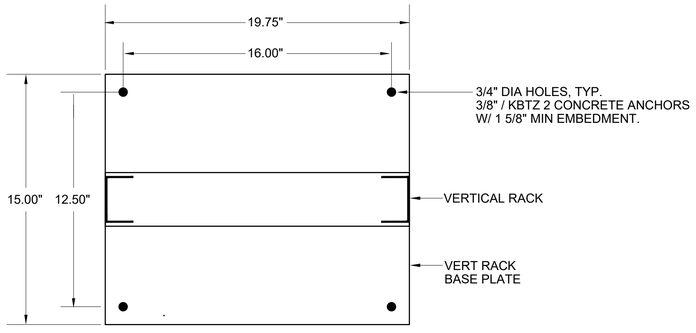


2 19 IN. EQUIPMENT RACK ELEVATION SEISMIC ZONE 4

NO SCALE



TOP SUPPORT

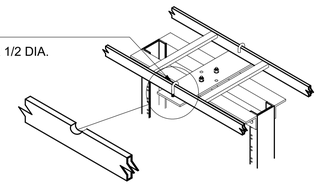


BASE ANCHORAGE

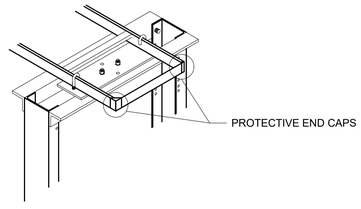
3 EQUIPMENT RACK BASE DIMENSIONS

NO SCALE

PARALLEL RACEWAY STRINGER



PERPENDICULAR RACEWAY STRINGER



4 EQUIPMENT RACK TO CALBE LADDER ATTACHMENT

NO SCALE

ECOM ENGINEERING
ECOM ENGINEERING INC.
1455 RESPONSE ROAD, SUITE 140
SACRAMENTO, CA, 95815
916.641.5600
916.641.1640 FAX
WWW.ECOMENG.COM

JOB NO. 22-Q153.00 PM. BS
DRAWN BY ECOM

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN SCHLENKER
No. E 021982
Exp. 9/30/25
ELECTRICAL
STATE OF CALIFORNIA

JOB TITLE:

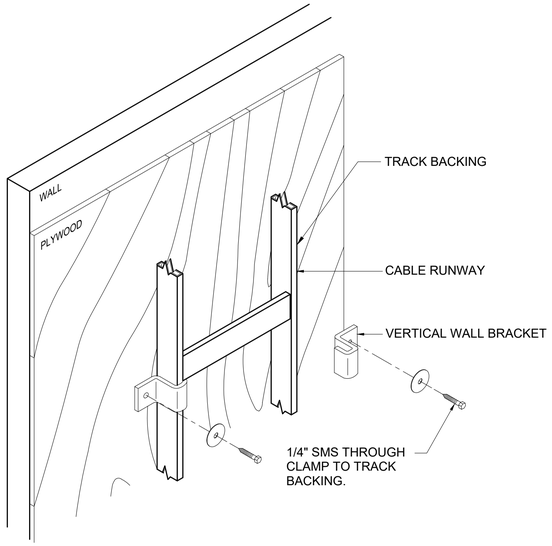
CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

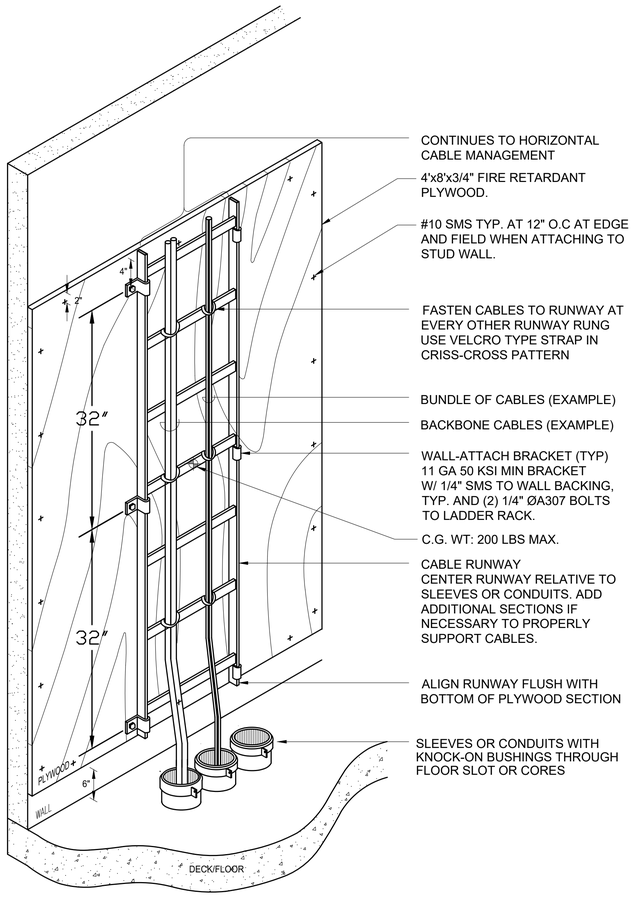
ELECTRICAL DETAILS

REVISIONS:

	DATE:	DESCRIPTION:
1		
2		
3		
4		
5		
6		

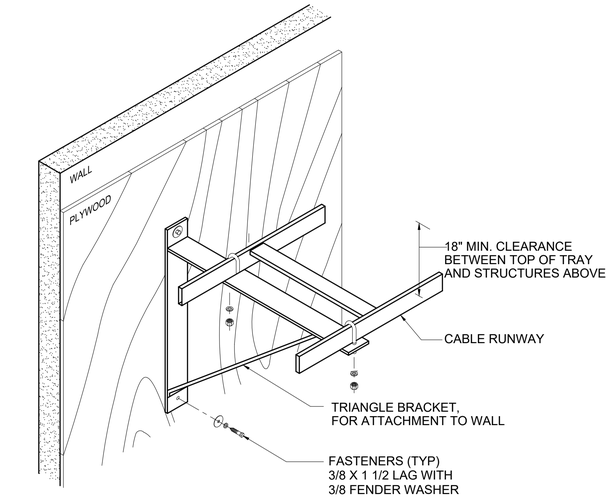
DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E6.3
OF - SHEETS

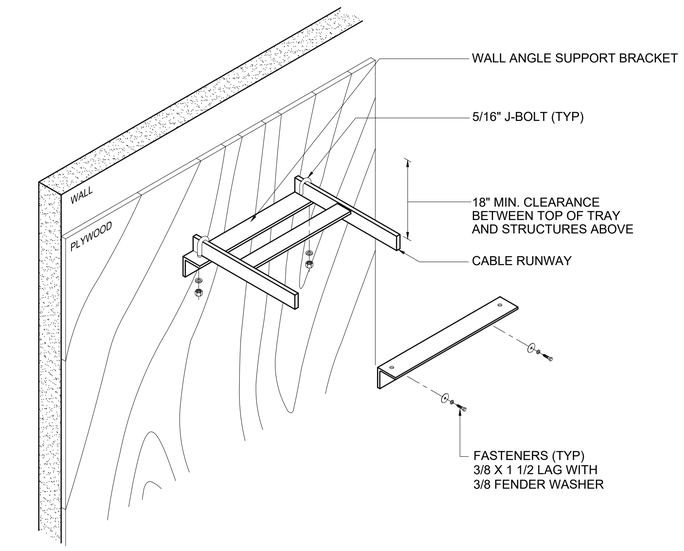




1 CABLE LADDER TO WALL BRACING - VERTICAL

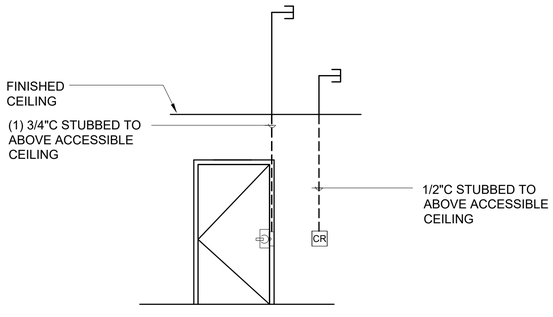
NO SCALE





2 CABLE LADDER TO WALL BRACING - HORIZONTAL

NO SCALE



NOTES:
1. EXIT IS ALWAYS FREE BY MEANS OF MECHANICAL HARDWARE.

3 DETAIL CARD READER WITH ELECTRIC STRIKE

NO SCALE

ECOM ENGINEERING
ECOM ENGINEERING INC.
1455 RESPONSE ROAD, SUITE 140
SACRAMENTO, CA. 95815
916.641.5600
916.641.1640 FAX
WWW.ECOMENG.COM
JOB NO. 22-Q153.00 PM. BS
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REGISTERED PROFESSIONAL ENGINEER
BENJAMIN SCHLENKER
No. E 021982
Exp. 9/30/25
ELECTRICAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA
ELECTRICAL DETAILS

REVISIONS:

	DATE:	DESCRIPTION:
1		
2		
3		
4		
5		
6		

DATE 12.09.22
DRAWN -
JOB NO. 21027
SHEET E6.4
OF - SHEETS

IMPROVEMENT PLANS
FOR
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING

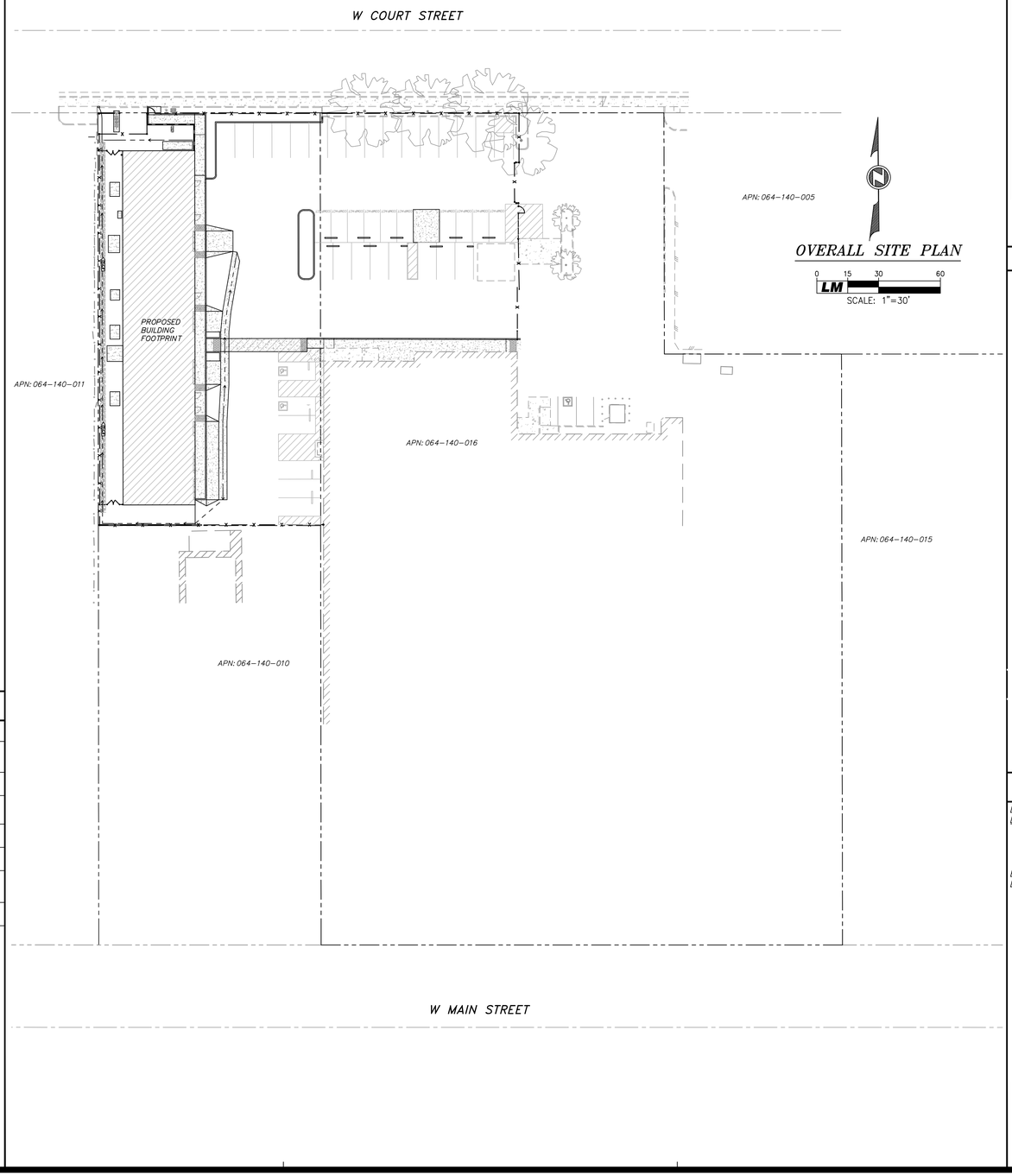
CITY OF WOODLAND — YOLO COUNTY, CA

LEGEND

PROPOSED	EXISTING	
12"SD	12"SD	STORM DRAIN AND MANHOLE
12"PSD		PERFORATED STORM DRAIN
6"SS	6"SS	SANITARY SEWER AND MANHOLE
8"SFM	8"SFM	SANITARY SEWER FORCE MAIN
P	P	SEWER PUMP STATION
		FIRE HYDRANT AND VALVE ASSEMBLY
10"W	10"W	WATER MAIN, VALVE, DOUBLE DETECTOR CHECK VALVE, METER & BLOWOFF VALVE
JT	JT	JOINT UTILITY TRENCH
GAS	GAS	GAS MAIN
(UG)E	(OH)E	ELECTRICAL LINE (UG–UNDERGROUND, OH–OVERHEAD)
(UG)T	(OH)T	TELEPHONE LINE (UG–UNDERGROUND, OH–OVERHEAD)
SL	SL	STREET LIGHT CONDUIT, WIRING & PULL BOX
SL E2	SL	STREET LIGHT SERVICE POINT AT UTILITY CO. BOX
		STREET LIGHT AND POLE
		UTILITY POLE WITH DOWN GUY & ANCHOR
PP, TP, JP	PP, TP, JP	POWER POLE, TELEPHONE POLE, JOINT POLE
x x x x	x x x x	FENCE
		VERTICAL CURB, GUTTER & SIDEWALK WITH DRIVEWAY
		CATCH BASIN OR DRAINAGE INLET
		FLOWLINE OF DITCH OR SWALE
		DIRECTION OF SURFACE DRAINAGE FLOW
		CUT OR FILL SLOPE
		RIGHT OF WAY OR PROPERTY LINE
		STREET CENTERLINE OR BASELINE
		SURVEY MONUMENT
		SIGN
		TREE
		TREE TO BE REMOVED
	12.34 × 12.34	EXISTING GROUND SURFACE ELEVATION
58.60 FG	58.60 FG	EDGE OF PAVEMENT AND ELEVATION
58.60 FL	58.60 FL	FLOW LINE GRADE
59.10 TC 58.60 AC 58.60 FC	59.10 TC 58.60 AC 58.60 FC	TOP OF CURB GRADE/ASPHALT GRADE
59.10 TG 58.60 FG 57.10 SG	59.10 TG 58.60 FG 57.10 SG	FINISHED CONCRETE GRADE
		TOP OF CURB/FINISHED GRADE/SUBGRADE ELEVATION
60.50± TC 60.00± FL 60.50± FC 60.50± AC 60.50± BEW		MATCH EXISTING GRADE (FIELD VERIFY)
		PUBLIC UTILITY EASEMENT
		ROLL CURB, GUTTER, & SIDEWALK
		GRADING RIDGE

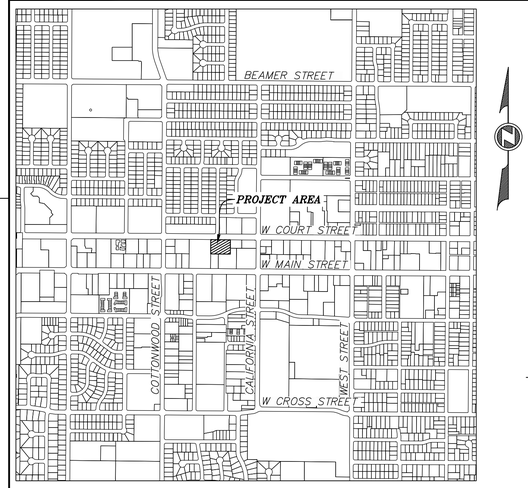
UTILITY REPRESENTATIVES

UTILITY	COMPANY	REPRESENTATIVE	PHONE NUMBER
GAS & ELECTRICITY	P.G.& E.	CRYSTALE ALESSIO–MEDRANO	(916) 760–2963
TELEPHONE	AT&T	LISA MARANO	(916) 484–2420
TELEPHONE	YOLO COUNTY TELECOMMUNICATIONS	TOM BATES	(530) 506–5012
CABLE TV	WAVE BROADBAND	FRANK BARGIEL	(916) 223–0123
USA			(916) 642–2444
WATER, SEWER & DRAINAGE	CITY OF WOODLAND	CRAIG LOCKE	(530) 661–5899
FIRE	CITY OF WOODLAND	FIRE MARSHALL	(530) 661–5533



OVERALL SITE PLAN
0 15 30 60
LM SCALE: 1"=30'

VICINITY MAP



SHEET INDEX

No.	DWG	TITLE
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2	C002	ABBREVIATIONS & GENERAL NOTES
3	C003	GENERAL NOTES
4	C101	TOPOGRAPHIC SURVEY & DEMOLITION PLAN
5	C201	CIVIL SITE PLAN
6	C301	GRADING & DRAINAGE PLAN
7	C302	GRADING & DRAINAGE PLAN
8	C401	UTILITIES PLAN
9	C501	STORMWATER CONTROL PLAN
10	C601	EROSION & SEDIMENTATION CONTROL PLAN
11	C701	DETAILS
12	C702	DETAILS
13	C801	CROSS SECTIONS

BENCH MARKS

DESIGNATION – LIBRARY
DESCRIPTION:

FD. 2–1/2" BRASS DISK IN MON. WELL STAMPED "YOLO COUNTY GPS SUBSIDENCE NETWORK LIBRARY 1999" 42' ± NE OF INTERSECTION OF COURT ST. & COLLEGE ST.

ELEVATION = 65.39
DATUM: NAVD88

REGISTERED PROFESSIONAL ENGINEER BRYAN P. BONINO No. 41804 CIVIL STATE OF CALIFORNIA

LM LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING
608 COURT STREET, WOODLAND, CALIFORNIA 95695 · PHONE: (530) 662–1755
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 · FAX: (530) 662–4602

BY BRYAN P. BONINO DATE 04/11/2024 P.E. 41804

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
TITLE SHEET
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
△		
△		
△		
△		
△		
△		

DATE	01.08.24
DRAWN	-
JOB NO.	464-81
SHEET	C001
	1 OF 13

X:\Land Projects\464-81\dwg\464-81_C001.dwg

ABBREVIATIONS

AB	AGGREGATE BASE	CO	CLEANOUT	EVC	END VERTICAL CURVE	LF	LINEAL FEET	PCC	PORTLAND CEMENT CONCRETE OR	RET	RETAINING	TEMP	TEMPORARY
AC	ASPHALT CONCRETE	CONC	CONCRETE	EX, EXIST	EXISTING	LOG	LIP OF GUTTER		POINT OF COMPOUND CURVATURE	RP	RADIUS POINT OR REFERENCE POINT	TFOC	TOP FACE OF CURB
ACP	ASBESTOS CEMENT PIPE	CONST	CONSTRUCT	EXP JT	EXPANSION JOINT	LT	LEFT OR LIGHT	PI	POINT OF INTERSECTION	RPBP	REDUCED PRESSURE BACKFLOW	TR	TOP OF ROCK
ARV	AIR RELEASE VALVE	COR	CORNER	FB	FLUSHER BRANCH	MAX	MAXIMUM	PL	PROPERTY LINE		PREVENTER	TRAF	TRAFFIC
ASB	AGGREGATE SUBBASE	CP	CONCRETE PIPE	FC	FINISHED CONCRETE	MH	MANHOLE	POC	POINT OF CONNECTION, POINT ON	RT	RIGHT	TRANS	TRANSITION
BC	BEGIN CURVE	CR	CURB RETURN	FDR	FULL DEPTH RECLAMATION	MIN	MINIMUM		CURVE	R/W	RIGHT-OF-WAY	TS	TOP OF SOIL
BW	BACK EDGE OF WALK	CSP	CORRUGATED STEEL PIPE	FEW	FRONT EDGE OF WALK	MOC	MIDDLE OF CURVE	PRC	POINT OF REVERSE CURVATURE	S	SOUTH OR SLOPE	TW	TOP OF WALL
BM	BENCH MARK	DC	DOUBLE CHECK	FF, FIN FLR	FINISHED FLOOR	MON	MONUMENT	PRVC	POINT OF REVERSE VERTICAL	SCH	SCHEDULE	TYP	TYPICAL
BOC	BACK OF CURB	DCA	DETECTOR CHECK ASSEMBLY	FG	FINISHED GRADE	MRC	MINIMUM RELATIVE COMPACTION		CURVATURE	SD	STORM DRAIN	UG	UNDERGROUND
BOV	BLOW-OFF VALVE	DI	DRAINAGE INLET	FH	FIRE HYDRANT	MTD	MOUNTED	PROJ	PROJECTED	SDFM	STORM DRAIN FORCE MAIN	UNO	UNLESS NOTED OTHERWISE
BR	BOTTOM OF ROCK	DIP	DUCTILE IRON PIPE	FL	FLOW LINE	MUTCD	MANUAL ON UNIFORM TRAFFIC	PROP	PROPERTY	SEC	SECTION	VAR	VARIES OR VARIABLE
BVC	BEGIN VERTICAL CURVE	DTL	DETAIL	FOC	FACE OF CURB OR CONCRETE		CONTROL DEVICES	PSE	PUBLIC SERVICE EASEMENT	SEP	SEPARATION	VCP	VITRIFIED CLAY PIPE
BW	BASE OF WALL	DW	DRIVEWAY	GB	GRADE BREAK	N	NORTH	PT	POINT	SIM	SIMILAR	VERT	VERTICAL
CATV	CABLE TELEVISION	DWG	DRAWING	INTX	INTERSECTION	NG	NATURAL GROUND	PUE	PUBLIC UTILITY EASEMENT	SL	STREET LIGHT	W	WEST
C&G	CURB AND GUTTER	E	EAST	INV	INVERT	NIC	NOT IN CONTRACT	PVCP	POLYVINYL CHLORIDE PIPE	SS	SEWER SERVICE, SANITARY SEWER	WM	WATER METER OR WATER MAIN
C,G,&SW	CURB, GUTTER AND SIDEWALK	EC	END CURVE	IOD	IRREVOCABLE OFFER OF DEDICATION	NTS	NOT TO SCALE	PVMT	PAVEMENT	STD	STANDARD	WQF	WATER QUALITY FLOW
CC	CENTER TO CENTER	ELEC	ELECTRIC(AL)	IRR	IRRIGATION	OA	OVERALL	PWD	PUBLIC WORKS DEPARTMENT	SW	SIDEWALK	WS	WATER SERVICE
CICP	CAST IN PLACE CONCRETE PIPE	EL, ELEV	ELEVATION	JB	JUNCTION BOX	OH	OVERHEAD	R	RADIUS, RADIAL OR RIGHT	SYM	SYMMETRICAL	XFMR	TRANSFORMER
CL	CENTERLINE, CONTROL LINE, CHAIN LINK OR CLASS	EP	EDGE OF PAVEMENT	JT	JOINT-USE TRENCH	PB	PULL BOX	RCP	REINFORCED CONCRETE PIPE	TC	TOP OF CURB OR CONCRETE	XING	CROSSING
		EQUIV	EQUIVALENT	L	LEFT	PCA	PORTLAND CEMENT ASSOCIATION	REQ'TS	REQUIREMENTS	TEL	TELEPHONE		

GENERAL NOTES:

1. STANDARDS AND PLANS

A. UNLESS SHOWN OR SPECIFIED OTHERWISE, ALL CONSTRUCTION AND MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF THE **CITY OF WOODLAND** STANDARD SPECIFICATIONS AND DETAILS, WITH THESE PLANS, THE PROJECT SPECIFICATIONS, AND WITH THE LATEST EDITIONS OF THE STATE "CALTRANS" STANDARD SPECIFICATIONS AND STANDARD PLANS, SIGN SPECIFICATION SHEETS AND TRAFFIC MANUAL AND THE LATEST EDITION OF THE CALIFORNIA MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES). THE CONTRACTOR SHALL OBTAIN AND USE ALL APPLICABLE ADDENDUMS.

B. IT IS INTENDED THAT THESE PLANS AND SPECIFICATIONS REQUIRE ALL LABOR AND MATERIALS NECESSARY AND PROPER FOR THE WORK CONTEMPLATED AND THAT THE WORK BE COMPLETED IN ACCORDANCE WITH THEIR TRUE INTENT AND PURPOSE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY REGARDING ANY DISCREPANCIES OR AMBIGUITIES WHICH MAY EXIST IN THE PLANS OR SPECIFICATIONS. THE ENGINEER'S INTERPRETATION OR CORRECTION THEREOF SHALL BE CONCLUSIVE.

C. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE ALL NECESSARY SITE INSPECTIONS AND DETERMINE ALL ITEMS OF WORK NOT SPECIFICALLY SHOWN AS BID ITEMS, OR OTHERWISE INDICATED, PRIOR TO BIDDING. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL ITEMS OF WORK NECESSARY TO PERFORM A COMPLETE AND ACCEPTABLE JOB.

D. WHERE THE PLANS OR SPECIFICATIONS DESCRIBE PORTIONS OF THE WORK IN GENERAL TERMS BUT NOT IN COMPLETE DETAIL, IT IS UNDERSTOOD THAT ONLY THE BEST GENERAL PRACTICE IS TO PREVAIL AND THAT ONLY MATERIALS AND WORKMANSHIP OF THE FIRST QUALITY ARE TO BE USED.

E. THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS AND THE **CITY**.

F. THE MAP SHOWN ON TITLE SHEET IS FOR GENERAL INFORMATION ONLY AND IS NOT INTENDED TO REPLACE THE DETAILED SHEETS ELSEWHERE IN THIS SET OF PLANS.

2. EXISTING UTILITIES AND COORDINATION OF WORK

A. THE TYPES, LOCATIONS, SIZES AND/OR DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE IMPROVEMENT PLANS WERE OBTAINED FROM SOURCES OF VARYING RELIABILITY. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE TYPES, EXTENT, SIZES, LOCATIONS AND DEPTHS OF SUCH UNDERGROUND UTILITIES. LAUGENOUR AND MEIKLE ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF ITS DELINEATION OF SUCH UNDERGROUND UTILITIES, NOR FOR THE EXISTENCE OF OTHER BURIED OBJECTS OR UTILITIES WHICH MAY BE ENCOUNTERED BUT WHICH ARE NOT SHOWN ON THESE DRAWINGS.

B. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE UTILITY COMPANIES INVOLVED AND REQUESTING A VISUAL VERIFICATION OF THE LOCATIONS OF THEIR UNDERGROUND FACILITIES. THE INSPECTOR AND THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR OF THE SCHEDULED TIME AND PLACE OF SUCH VISUAL VERIFICATION TO ENABLE THEM TO HAVE REPRESENTATIVES PRESENT. IF IN THE OPINION OF THE INSPECTOR A CONFLICT EXISTS, THEN THE ENGINEER SHALL: (1) MAKE ANY NEEDED GRADE AND/OR ALIGNMENT ADJUSTMENTS AND REVISE THE PLANS ACCORDINGLY; AND/OR (2) CONTACT THE UTILITY PARTY RESPONSIBLE FOR THE RELOCATION OF THE CONFLICTING FACILITY.

C. **CITY OF WOODLAND** IS A MEMBER OF THE UNDERGROUND SERVICE ALERT (U.S.A.) ONE-CALL PROGRAM. THE CONTRACTOR OR ANY SUBCONTRACTOR FOR THIS CONTRACT SHALL NOTIFY MEMBERS OF U.S.A. 48 HOURS IN ADVANCE OF PERFORMING EXCAVATION WORK BY CALLING THE TOLL-FREE NUMBER 1-800-642-2444. EXCAVATION IS DEFINED AS BEING MORE THAN 18 INCHES IN DEPTH BELOW THE EXISTING SURFACE.

D. UTILITY COMPANIES ARE PREPARING TO RELOCATE EXISTING FACILITIES AND/OR CONSTRUCT NEW FACILITIES WITHIN PORTIONS OF THE WORK AREA. THE CONTRACTOR SHALL COORDINATE ALL HIS WORK WITH PROJECT RELATED WORK TO BE PERFORMED BY UTILITY COMPANIES (INCLUDING GAS, ELECTRIC, TELEPHONE AND CABLE TV) AND BY OTHER PROJECT CONTRACTORS INCLUDING BUILDING, PLUMBING, LANDSCAPING, ELECTRIC AND FIRE PROTECTION. THE CONTRACTOR SHALL AFFORD THESE UTILITY COMPANIES AND CONTRACTORS REASONABLE OPPORTUNITY FOR THE EXECUTION OF THEIR WORK AND SHALL COORDINATE HIS WORK WITH THEIRS. IN THE EVENT OF DELAYS OR CHANGES IN THE WORK BEYOND THE CONTROL OF THE CONTRACTOR, TIME EXTENSIONS AND NECESSARY CHANGES SHALL BE MADE AS PROVIDED IN THE CONTRACT.

E. ANY EXISTING UNDERGROUND UTILITY (INCLUDING PIPELINES) WHICH IS TO BE EXTENDED, WHICH IS THE CONNECTION POINT FOR NEW UNDERGROUND UTILITIES, OR WHICH NEW FACILITIES CROSS, SHALL BE EXPOSED BY THE CONTRACTOR PRIOR TO CONSTRUCTION STAKING FOR PLACEMENT OF THE NEW UTILITIES. COST OF SUCH EXCAVATION AND SUBSEQUENT BACKFILL SHALL BE INCLUDED IN THE PRICES PAID FOR THE VARIOUS ITEMS OF WORK. THE ELEVATIONS AND LOCATIONS OF THE EXISTING UTILITIES WILL BE CHECKED FOR POSSIBLE CONFLICTS WITH PLANS BY THE PUBLIC WORKS INSPECTOR AND THE ENGINEER. IF IN THE OPINION OF THE INSPECTOR A CONFLICT EXISTS, THEN THE ENGINEER SHALL: (1) MAKE ANY NEEDED GRADE AND/OR ALIGNMENT ADJUSTMENTS AND REVISE THE PLANS ACCORDINGLY; AND/OR (2) CONTACT THE UTILITY PARTY RESPONSIBLE FOR THE RELOCATION OF THE CONFLICTING FACILITY.

3. CONSTRUCTION STAKING

A. CONSTRUCTION STAKING SHALL BE FURNISHED BY THE CONTRACTOR. THE CONTRACTOR WILL BE PROVIDED WITH AN AUTOCAD FILE THAT WILL CONTAIN CONTROL POINTS FROM THE ORIGINAL SURVEY THAT CAN BE UTILIZED TO ASSIST IN THE CONSTRUCTION STAKING OF THE IMPROVEMENTS. AFTER SIGNING A DISCLAIMER STATEMENT FROM THE ENGINEER, THE CONTRACTOR SHALL MAKE OR FURNISH ALL SURVEYS AND SET ALL CONSTRUCTION STAKES NECESSARY FOR THE COMPLETION OF THE WORK.

B. THESE IMPROVEMENT PLANS HAVE BEEN PREPARED WITH THE INTENT THAT LAUGENOUR AND MEIKLE WILL BE PERFORMING THE CONSTRUCTION STAKING FOR THE COMPLETE PROJECT. IF, HOWEVER, ANOTHER ENGINEER AND/OR SURVEY FIRM SHOULD BE EMPLOYED TO USE THESE PLANS FOR THE PURPOSE OF CONSTRUCTION STAKING, NOTICE IS HEREBY GIVEN THAT LAUGENOUR AND MEIKLE WILL NOT ASSUME ANY RESPONSIBILITY FOR ANY ERRORS OR OMISSIONS WHICH MIGHT OCCUR AND WHICH COULD HAVE BEEN AVOIDED, CORRECTED OR MITIGATED IF LAUGENOUR AND MEIKLE HAD PERFORMED THE CONSTRUCTION STAKING WORK.

4. FIELD VERIFICATION

WHERE NEW IMPROVEMENTS (CURB, GUTTER, SIDEWALK, PAVEMENT, ASPHALT, UTILITIES, ETC.) ARE DESIGNATED TO MATCH GRADE (±) AT EXISTING IMPROVEMENTS, THE CONTRACTOR'S SURVEYOR SHALL VERIFY THE MATCH POINT GRADES, REPORT ANY DISCREPANCIES AND ADJUST GRADES TO MATCH EXISTING.

5. CONFLICTS

THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO PERFORMING ANY CORRECTIVE ACTION REQUIRED DUE TO UNFORESEEN CONFLICTS IN THE IMPROVEMENT PLANS OR DUE TO POSSIBLE STAKING ERRORS. THE ENGINEER ASSUMES NO LIABILITY FOR THE COST OR DESIGN OF ANY MODIFICATION PERFORMED WITHOUT SUCH NOTIFICATION, AND ALSO ASSUMES NO LIABILITY FOR STAKING PROVIDED BY OTHERS.

6. CONTROL POINTS AND SURVEY MONUMENTS

A. CERTAIN CONTROL POINTS HAVE BEEN SET BY THE ENGINEER, OR ITS REPRESENTATIVE, WHICH ARE CRITICAL TO THE CONSTRUCTION STAKING OF THE PROJECT. THESE POINTS WILL BE DESIGNATED ON THE IMPROVEMENT PLANS. THE CONSTRUCTION SHALL NOT DISTURB THE CONTROL POINTS IN ANY MANNER. IF IT BECOMES NECESSARY TO REMOVE SAID CONTROL POINTS DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE LICENSED SURVEYOR RESPONSIBLE FOR CONSTRUCTION STAKING AND SHALL REMOVE AND REPLACE AS NOTED BELOW.

B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND REPLACEMENT OF ALL EXISTING SURVEY MONUMENTS OF RECORDS AND OTHER CONTROL MARKERS DURING CONSTRUCTION. ALL MONUMENTS OR MARKERS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. WHEN THE LOCATION OF AN EXISTING MONUMENT CONFLICTS WITH PROPOSED WORK, THE CONTRACTOR SHALL HAVE A LICENSED LAND SURVEYOR REFERENCE THE MONUMENT PRIOR TO REMOVAL. AFTER THE MONUMENT HAS BEEN REFERENCED THE CONTRACTOR MAY REMOVE THE MONUMENT AND LATER HAVE IT REPLACED BY A LICENSED LAND SURVEYOR WHO SHALL FILE A CORNER RECORD WITH THE COUNTY.

7. OBSTRUCTIONS

A. THE CONTRACTOR SHALL REMOVE ALL OBSTRUCTIONS, BOTH ABOVE GROUND AND UNDERGROUND, EXCEPT AS NOTED IN ITEM 2 ABOVE, AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS. WHEN FEASIBLE SUCH WORK SHALL BE COMPLETED PRIOR TO GRADING.

B. ALL UNSUITABLE AND SURPLUS MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UNLESS SPECIFIED OTHERWISE.

C. TREE AND STUMP REMOVAL SHALL INCLUDE REMOVAL OF THE MAJOR ROOT SYSTEM TO THE SATISFACTION OF THE **CITY** ENGINEER. SUCH REMOVAL SHALL BE PERFORMED WITHOUT DAMAGE TO ADJACENT TREES THAT ARE TO BE PRESERVED. STUMP REMOVAL WITHIN THE DRIP LINE OF A TREE TO BE PRESERVED SHALL BE BY GRINDING METHOD, TO A DEPTH OF 0.5 FEET BELOW ADJACENT GRADE.

D. ALL WATER WELLS AND SEPTIC TANK SYSTEMS FOUND ON THE SITE SHALL BE DESTROYED IN ACCORDANCE WITH COUNTY HEALTH DEPARTMENT STANDARDS AND PERMITS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL SUCH LOCATIONS PRIOR TO COMMENCING WORK IN THESE AREAS.

8. PUBLIC SAFETY AND TRAFFIC CONTROL

A. CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL CURRENTLY APPLICABLE SAFETY LAWS OF ALL JURISDICTIONAL BODIES. THE CONTRACTOR IS DIRECTED TO CONTACT THE STATE INDUSTRIAL RELATIONS DEPARTMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BARRICADES, SAFETY DEVICES, AND CONTROL OF TRAFFIC WITHIN AND AROUND THE CONSTRUCTION AREA. FOR ALL TRENCH EXCAVATIONS 5 FEET OR MORE IN DEPTH, THE CONTRACTOR SHALL OBTAIN A PERMIT FROM THE DIVISION OF INDUSTRIAL SAFETY PRIOR TO BEGINNING ANY EXCAVATION.

B. PUBLIC SAFETY AND TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH THE CALTRANS TRAFFIC MANUAL (SEE CHAPTER 5, MANUAL OF TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS) AND AS DIRECTED BY THE **CITY** ENGINEER. ANY LANE CLOSURES (VEHICLE OR BICYCLE) SHALL BE APPROVED BY THE **CITY** ENGINEER. SAFE VEHICULAR AND PEDESTRIAN ACCESS SHALL BE PROVIDED AT ALL TIMES DURING CONSTRUCTION.

C. THE CONTRACTOR SHALL MAINTAIN CONTINUOUS TEMPORARY CHANNELIZING DEVICES, AND FLAGGING OR FLASHING DEVICES AS NEEDED, SPACED AT INTERVALS NOT TO EXCEED 50 FEET, WHENEVER THE WORK AREA IS ADJACENT TO AN EXISTING TRAFFIC LANE AND THERE IS A PAVEMENT CUT, TRENCH OR DITCH WHICH IS OVER 2 INCHES IN DEPTH. IF THE CUT, TRENCH OR DITCH IS MORE THAN 10 FEET FROM A TRAFFIC LANE, THEN THE SPACING MAY BE GREATER, PROVIDED THAT IT DOES NOT EXCEED 200 FEET.

D. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICE, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.

E. IN THE EVENT THAT ANY STREET OR PORTION OF ANY STREET WILL BE CLOSED TO EMERGENCY TRAFFIC, THE CONTRACTOR SHALL NOTIFY **YOLO COUNTY COMMUNICATIONS DISPATCH AT (530)666-8900** IMMEDIATELY PRIOR TO CLOSURE AND IMMEDIATELY AFTER REOPENING OF SAID STREET OR STREET PORTION.

9. PERMITS, LICENSES AND REGULATIONS

A. PERMITS AND LICENSES OF A TEMPORARY NATURE AND NECESSARY FOR THE PROSECUTION OF THE WORK SHALL BE SECURED AND PAID FOR BY THE CONTRACTOR. PERMITS, LICENSES AND EASEMENTS FOR PERMANENT STRUCTURES OR PERMANENT CHANGES IN EXISTING FACILITIES SHALL BE SECURED AND PAID FOR BY THE OWNER UNLESS OTHERWISE SPECIFIED.

B. THE CONTRACTOR SHALL NOTIFY THE **CITY** AT LEAST 48 HOURS PRIOR TO THE INTENT TO COMMENCE WORK.

C. ALL WATER WELLS AND SEPTIC TANK SYSTEMS FOUND ON THE SITE SHALL BE DESTROYED IN ACCORDANCE WITH COUNTY HEALTH DEPARTMENT STANDARDS. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FROM THE COUNTY.

D. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES AND REGULATIONS BEARING ON THE CONDUCT OF THE WORK AS SHOWN ON THE PLANS AND DESCRIBED IN THE SPECIFICATIONS. HE SHALL PROMPTLY NOTIFY THE ENGINEER IN WRITING OF ANY SPECIFICATION AT VARIANCE THEREWITH AND ANY NECESSARY CHANGES SHALL BE ADJUSTED AS PROVIDED IN THE CONTRACT FOR CHANGES IN THE WORK. IF THE CONTRACTOR PERFORMS ANY WORK CONTRARY TO SUCH LAWS, ORDINANCES, RULES AND REGULATIONS HE SHALL BEAR ALL COSTS ARISING THEREFROM.

10. STATIONING AND DIMENSIONING

ALL STATIONS REFER TO DISTANCES ALONG STREET CENTER LINE UNLESS INDICATED OTHERWISE. ALL STATIONS OFF CENTER LINE ARE PERPENDICULAR TO OR RADIALLY OPPOSITE CENTER LINE STATIONS. STREET FRONTAGE PROPERTY LINES COINCIDE WITH BACK EDGE OF WALK ALIGNMENT UNLESS INDICATED OTHERWISE. UNLESS NOTED OTHERWISE, DIMENSIONS TO CURBS REFER TO TOP FACE OF CURB AND DIMENSIONS TO BUILDINGS REFER TO FACE OF EXTERIOR WALL.

11. EARTHWORK

A. ALL EARTHWORK ACTIVITIES, INCLUDING EXCAVATION, GRADING, SCARIFYING, MOISTURIZING, FILL PLACEMENT, COMPACTION, LIME TREATMENT, ETC., SHALL BE PERFORMED IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE PROJECT GEOTECHNICAL ENGINEERING REPORT (SEE TITLE SHEET) AND IN CONFORMANCE WITH THE **CITY** STANDARD SPECIFICATIONS AND WITH THE GRADING PLAN.

B. THE GEOTECHNICAL ENGINEER SHALL OBSERVE THE GRADING ACTIVITIES AND PERFORM COMPACTION TESTING FOR THIS PROJECT. THE CONTRACTOR SHALL PROVIDE AT LEAST 24 HOURS NOTICE TO THE GEOTECHNICAL ENGINEER OF THE NEED FOR OBSERVATION AND TESTING SERVICES. THE PROJECT OWNER WILL PAY FOR THE COST OF PROVIDING THESE SERVICES; HOWEVER, IF SAMPLES OF MATERIALS ARE SUBMITTED WHICH FAIL TO PASS THE SPECIFIED TESTS OR IF WORK IS PERFORMED WHICH FAILS TO MEET THESE SPECIFICATIONS, THE CONTRACTOR SHALL PAY FOR ALL SUBSEQUENT RE-TESTS AND RE-INSPECTIONS.

C. EARTHWORK SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO CONSTRUCT THE SITE TO THE GRADES SHOWN. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THE DISPOSAL OF EXCESS EXCAVATED MATERIAL OR FOR THE IMPORT OF MATERIAL. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN ADVANCE OF ANY CHANGES HE MAY DEEM NECESSARY TO OBTAIN BALANCED CUT-FILL GRADING. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS RELATED TO CHANGES PER THIS REQUEST. ENGINEER SHALL EVALUATE POSSIBLE CHANGES TO ACCOMMODATE THIS REQUEST, BUT MAY DENY REQUEST ALL TOGETHER DUE TO DESIGN CONSTRAINTS.

D. ALL CUT SLOPES SHALL BE ROUNDED AT THE "BREAK" SO THAT THEY BLEND WITH THE NATURAL GROUND CONTOUR.

E. THE CONTRACTOR SHALL APPLY EITHER WATER OR DUST PALLIATIVE, OR BOTH, FOR THE ALLEVIATION OR PREVENTION OF DUST NUISANCE AS DIRECTED BY THE ENGINEER.

F. EXCAVATION AND EMBANKMENT SIDE SLOPES SHOWN ON THE PLANS AS A RATIO, E.G. 4:1, REFER TO THE RATIO OF HORIZONTAL TO VERTICAL DISTANCES. "MINIMUM" SLOPE MEANS "NOT FLATTER THAN", AND "MAXIMUM" SLOPE MEANS "NOT STEEPER THAN". ALL EMBANKMENT AND EXCAVATION SLOPES SHALL BE 4:1 UNLESS NOTED OTHERWISE.

G. TO ACCOMMODATE TRENCH SPOIL, THE CONTRACTOR'S GRADING SHALL INCLUDE UNDERCUTTING OF STREETS AS APPROPRIATE, OR SOME OTHER METHOD APPROVED BY THE ENGINEER.

H. ALL SECTIONS AND DETAILS SHOWN IN THESE PLANS ARE SOLELY INTENDED TO BE REPRESENTATIVE OF THE GRADING AND DRAINAGE DESIGN FOR THE PROJECT. IN NO WAY ARE THEY INTENDED TO REFLECT THE ACTUAL CONSTRUCTION ELEMENTS OF THE FENCING, WALLS, TRASH ENCLOSURE, ETC., UNLESS SPECIFICALLY CALLED OUT AS "CONSTRUCT" OR "PLACE" IN THESE PLANS.

I. ALLOWABLE SUBGRADE GRADING TOLERANCE IS PLUS OR MINUS 0.04' OF THE ELEVATIONS SHOWN HEREON FOR BUILDING PAD, PAVING, OR CONCRETE AREAS. FINAL SURFACE TOLERANCE IS PLUS OR MINUS 0.02'. ADA PATH AREAS SHALL BE IN FULL COMPLIANCE AND SHALL NOT EXCEED MAXIMUM SLOPE REQUIREMENTS.

J. EROSION CONTROL MEASURES SHALL BE IMPLEMENTED DURING PROJECT CONSTRUCTION. COMPLY WITH EROSION AND SEDIMENTATION CONTROL PLAN, BMP AND **AGENCY** STANDARDS.

K. UNTREATED SUBGRADE PREPARATION FOR ALL PAVEMENT SECTIONS AND FOR CURB, GUTTER AND SIDEWALK SHALL INCLUDE COMPACTION IN AT LEAST THE TOP 8 INCHES TO AT LEAST 95% RELATIVE COMPACTION AT OR ABOVE OPTIMUM MOISTURE CONTENT.

L. ALL STREET ELEVATIONS SHOWN ARE FOR TOP OF CURB (TC) UNLESS OTHERWISE SPECIFIED.

M. THE TOP 8 INCHES (MINIMUM) OF ALL LANDSCAPED AREAS SHALL BE CLEAN SOIL.

N. CLEARING, GRUBBING AND PREPARING IMPROVEMENT AREAS:

i. ALL RUBBLE AND RUBBISH AND OTHER ITEMS ENCOUNTERED DURING SITE WORK AND DEEMED UNACCEPTABLE BY THE GEOTECHNICAL ENGINEER, SHALL BE REMOVED AND DISPOSED OF SO AS TO LEAVE THE DISTURBED AREAS WITH A NEAT AND FINISHED APPEARANCE, FREE FROM UNSIGHTLY DEBRIS. EXCAVATIONS AND DEPRESSIONS RESULTING FROM THE REMOVAL OF SUCH ITEMS, AS WELL AS EXISTING EXCAVATIONS OR LOOSE SOIL DEPOSITS, AS DETERMINED BY THE GEOTECHNICAL ENGINEER, SHALL BE CLEANED OUT TO FIRM, UNDISTURBED SOIL AND BACKFILLED WITH SUITABLE MATERIALS IN ACCORDANCE WITH THESE SPECIFICATIONS.

ii. THE SURFACES RECEIVING FILL SHALL BE STRIPPED OF VEGETATION OR THEY SHALL BE THOROUGHLY DISCED PROVIDED THAT A COMPACTABLE MIXTURE OF SOIL CONTAINING MINOR AMOUNTS OF VEGETATION CAN BE ATTAINED WHICH IS FREE OF CLUMPS, LAYERS OR POCKETS OF VEGETATION. IF PROPER COMPACTION OF THE DISTURBED SURFACE SOILS CANNOT BE ACHIEVED, THOSE MATERIALS SHALL BE EXCAVATED, TO A DEPTH SATISFACTORY TO THE GEOTECHNICAL ENGINEER, SO THAT A FIRM BASE FOR SUPPORT OF ENGINEERED FILL CAN BE ATTAINED.

iii. ALL LOOSE AND/OR SATURATED MATERIALS SHALL BE OVER-EXCAVATED TO FIRM SOIL, AS DETERMINED BY THE GEOTECHNICAL ENGINEER, AND THE RESULTING EXCAVATIONS SHALL BE BACKFILLED WITH SUITABLE MATERIALS IN ACCORDANCE WITH THESE SPECIFICATIONS.

iv. THE SURFACES UPON WHICH FILL IS TO BE PLACED SHALL BE PLOWED OR SCARIFIED TO A DEPTH OF AT LEAST 12 INCHES, UNTIL THE SURFACE IS FREE FROM RUTS, MOUNDS OR OTHER UNEVEN FEATURES WHICH WOULD TEND TO PREVENT UNIFORM COMPACTION BY THE SELECTED EQUIPMENT.

v. WHEN THE MOISTURE CONTENT OF THE SUBGRADE IS LESS THAN 2 PERCENT ABOVE THE OPTIMUM, AS DEFINED BY THE ASTM D1557-91 COMPACTION TEST, WATER SHALL BE ADDED UNTIL THE PROPER MOISTURE CONTENT IS ACHIEVED.

vi. WHEN THE MOISTURE CONTENT OF THE SUBGRADE IS TOO HIGH TO PERMIT THE SPECIFIED COMPACTION TO BE ACHIEVED, THE SUBGRADE SHALL BE AERATED BY BLADING OR OTHER METHODS UNTIL THE MOISTURE CONTENT IS SATISFACTORY FOR COMPACTION.

vii. AFTER THE FOUNDATIONS FOR FILL HAVE BEEN CLEARED, MOISTURE CONDITIONED, AND PLOWED OR SCARIFIED, THEY SHALL BE RECOMPACTED IN PLACE TO A DEPTH OF AT LEAST 12 INCHES TO A MINIMUM OF 90 PERCENT OF THE ASTM D1557-91 MAXIMUM DRY DENSITY.

viii. ANY UNSUITABLE MATERIAL ENCOUNTERED BELOW THE SUBGRADE SHALL BE BROUGHT TO THE ATTENTION OF AND REMOVED AT THE DIRECTION OF THE ENGINEER. UNSUITABLE MATERIAL IS DEFINED AS MATERIAL THE ENGINEER DETERMINES TO BE:

- OF SUCH UNSTABLE NATURE AS TO BE INCAPABLE OF BEING COMPACTED TO SPECIFIED DENSITY USING ORDINARY METHODS AT OPTIMUM MOISTURE CONTENT; OR
- TOO WET TO BE PROPERLY COMPACTED AND CIRCUMSTANCES PREVENT SUITABLE IN-PLACE DRYING PRIOR TO INCORPORATION INTO THE WORK; OR
- OTHERWISE UNSUITABLE FOR THE PLANNED USE.

ix. THE PRESENCE OF EXCESSIVE MOISTURE IN A MATERIAL IS NOT, BY ITSELF, SUFFICIENT CAUSE FOR DETERMINING THAT THE MATERIAL IS UNSUITABLE.

x. THE CONTRACTOR SHALL USE EXTRA CARE IN EXCAVATING UNSUITABLE MATERIAL SO AS NOT TO AGGRAVATE THE CONDITION. IF, IN THE OPINION OF THE GEOTECHNICAL ENGINEER, THE CONTRACTOR'S METHODS FOR EXCAVATING ARE INCREASING THE AMOUNT OF UNSUITABLE MATERIAL REQUIRED TO BE EXCAVATED, THE GEOTECHNICAL ENGINEER WILL REQUIRE THE CONTRACTOR TO TAKE THE NECESSARY STEPS TO CORRECT THE CONDITION.

xi. BACKFILL TO REPLACE THE REMOVED UNSUITABLE MATERIAL SHALL BE CL. II AB COMPACTED TO 90% MRC.

xii. REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL, INCLUDING THE ADDITIONAL EXCAVATION GREATER THAN THAT REQUIRED FOR PREPARATION OF SUBGRADE, AND SUBSEQUENT BACKFILLING SHALL BE AT THE CONTRACTORS EXPENSE.

O. CONSTRUCTION OF UNTREATED SUBGRADES:

i. THE SELECTED SOIL FILL MATERIAL SHALL BE PLACED IN LAYERS WHICH, WHEN COMPACTED, DO NOT EXCEED 6 INCHES IN THICKNESS. EACH LAYER SHALL BE SPREAD EVENLY AND SHALL BE THOROUGHLY MIXED DURING THE SPREADING TO PROMOTE UNIFORMITY OF MATERIAL IN EACH LAYER.

ii. WHEN THE MOISTURE CONTENT OF THE GRANULAR FILL MATERIAL IS LESS THAN OPTIMUM MOISTURE, OR WHEN THE MOISTURE CONTENT OF THE CLAY FILL MATERIAL IS LESS THAN TWO PERCENT ABOVE OPTIMUM PRESSURE AS DEFINED BY THE ASTM D1557-91 COMPACTION TEST, WATER SHALL BE ADDED UNTIL THE PROPER MOISTURE CONTENT IS ACHIEVED.

iii. WHEN THE MOISTURE CONTENT OF THE FILL MATERIAL IS TOO HIGH TO PERMIT THE SPECIFIED DEGREE OF COMPACTION TO BE ACHIEVED, THE FILL MATERIAL SHALL BE AERATED BY BLADING OR OTHER METHODS UNTIL THE MOISTURE CONTENT IS SATISFACTORY.

iv. AFTER

GENERAL NOTES:

12. CONCRETE CONSTRUCTION (CONTINUED)

I. THE GRADES SHOWN ON THE PLANS FOR SIDEWALKS OR ANY GRADES RELATING TO THE SIDEWALKS ARE INTENDED TO INDICATE THE FOLLOWING MAXIMUM SLOPES:

- CROSS-SLOPE PERPENDICULAR TO THE DIRECTION OF TRAVEL: 2.00% (50:1)
- SLOPE PARALLEL TO THE DIRECTION OF TRAVEL: 5.00% (20:1)
- THE GRADES SHOWN ON PLANS ARE INTENDED TO BE USED AS A GUIDE ONLY.

i. PRIOR TO SETTING FORMS, THE CONTRACTOR SHALL CONFIRM THAT THE GRADES INDICATED WILL RESULT IN SLOPES CONSISTENT WITH THE ABOVE CRITERIA. SHOULD ANY DISCREPANCY APPEAR TO EXIST, THE CONTRACTOR SHALL ADJUST THE GRADES TO CONFORM TO THE ABOVE CRITERIA AND SHALL INFORM THE ENGINEER OF SUCH CHANGES.

ii. PRIOR TO PLACING CONCRETE THE CONTRACTOR SHALL CHECK THE LEVEL OF THE FORMS TO CONFIRM THAT THE AS-BUILT CONCRETE SLOPES WILL CONFORM TO THE ABOVE CRITERIA AND HE SHALL PLACE THE CONCRETE ACCORDINGLY. IT IS RECOMMENDED THAT CONSTRUCTION TOLERANCES USED BY THE CONTRACTOR RESULT IN SLOPES SLIGHTLY FLATTER THAN THE ABOVE CRITERIA, NOT STEEPER; YET THE CONCRETE SURFACES MUST PROPERLY DRAIN. THE ABOVE CRITERIA AND THE SLOPES SUGGESTED BY THE GRADES INDICATED ON THE PLANS ARE INTENDED TO REPRESENT MAXIMUM SLOPES.

J. SIDEWALKS ARE TO BE SET FLUSH WITH THE TOP OF ABUTTING CURBS UNLESS NOTED OTHERWISE.

K. ALL CURB, GUTTER AND SIDEWALK SHALL BE PLACED MONOLITHICALLY UNLESS NOTED OTHERWISE.

L. PCC PAVING SHALL BE CONSTRUCTED IN CONFORMANCE WITH CALTRANS STANDARD SPECIFICATIONS SECTION 73 AND SECTION 90. REGULATE WATER CONTENT OF MIX SO THAT MAXIMUM PENETRATION DOES NOT EXCEED 1.5 INCHES. PAVEMENT SLABS TO BE DOWELED AT ALL JOINTS. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL SUBMIT FOR OWNER'S APPROVAL A COPY OF THE JOINT PLAN, DETAILING THE TYPES AND LOCATIONS OF CONSTRUCTION, CONTROL AND EXPANSION JOINTS.

M. SITE CONCRETE

i. CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACI-318.

ii. POPORTLAND CEMENT SHALL COMPLY WITH ASTM C150 TYPE II (25% OF PORTLAND CEMENT SHALL BE REPLACED WITH COAL FLY ASH COMPLYING WITH ASTM C618).

iii. CONCRETE FOR EXTERIOR FLAT WORK ON GRADE SHALL HAVE MINIMUM STRENGTH = 3,500 PSI @ 28 DAYS AND MAXIMUM WATER-CEMENT RATIO = 0.50.

iv. MAXIMUM AGGREGATE SIZE SHALL BE 1".

v. CONCRETE MIX SHALL CONTAIN A MINIMUM OF 5 SACKS PER YARD.

vi. 7-DAY MINIMUM WET CURING TIME.

vii. A MECHANICAL VIBRATOR SHALL BE USED TO VIBRATE CONCRETE INTO PLACE.

viii. FORM REMOVAL AT 2 DAYS MINIMUM.

ix. REINFORCEMENT REQUIREMENTS:

- ALL DEFORMED BARS SHALL BE A-615 GRADE 60.
- LAP SPLICES SHALL BE 45 BAR DIAMETERS.

x. MINIMUM CONCRETE COVER OF REINFORCING SHALL BE 3" FOR CONCRETE CAST AGAINST EARTH, 2" FOR CONCRETE EXPOSED TO WEATHER.

y. CONTRACTOR SHALL SUBMIT MIX DESIGN FOR REVIEW.

13. PAVING

A. ALL ASPHALT CONCRETE SHALL CONFORM TO CALTRANS PERFORMANCE GRADED (PG) SYSTEM MEETING PG 64-10 FOR INLAND VALLEY AREAS. ASPHALTIC CONCRETE SHALL BE PLACED IN 3" MAXIMUM LIFTS. USE 3/4 INCH MAXIMUM, MEDIUM AGGREGATE. ALL PAVING WITHIN CITY R/W SHALL CONFORM TO CITY STANDARDS. ALL AGGREGATE BASE SHALL BE CALTRANS CLASS 2, 3/4 INCH MAXIMUM; OMIT PENETRATION TREATMENT. AGGREGATE SUBBASE SHALL BE CALTRANS CLASS 2. RELATIVE COMPACTION OF BASE AND SUBBASE MATERIALS SHALL NOT BE LESS THAN 95%.

B. ALL EXISTING PAVEMENT TO BE JOINED TO NEW PAVEMENT SHALL BE SAW CUT TO A NEAT, STRAIGHT LINE A MINIMUM OF ONE (1) FOOT FROM THE EXISTING EDGE OF PAVEMENT OR FIRM STABLE SURFACE AS DEFINED WITH FIELD INSPECTION. THE EXPOSED EDGE SHALL BE TACKED WITH ASPHALTIC EMULSION PRIOR TO PAVING. THE EXISTING BASE ROCK AND PAVEMENT SHALL BE REMOVED TO THE FULL DEPTH OF THE NEW SECTION.

A TACK COAT SHALL BE APPLIED TO ALL VERTICAL SURFACES OF EXISTING PAVEMENT, CURBS, GUTTERS AND CONSTRUCTION JOINTS IN THE SURFACING AGAINST WHICH ADDITIONAL MATERIAL IS TO BE PLACED, TO A PAVEMENT TO BE SURFACED, AND TO OTHER SURFACES DESIGNATED BY THE ENGINEER.

C. NO PAVEMENT WORK SHALL OCCUR WITHIN THE STREET RIGHT-OF-WAY PRIOR TO COMPLETION OF UTILITY POLE RELOCATION OR REMOVAL. THE CONTRACTOR SHALL COORDINATE WITH ALL OTHER WORK TO ENSURE THAT ALL UNDERGROUND UTILITIES ARE INSTALLED PRIOR TO PAVING.

D. PAVEMENT REINFORCING FABRIC INSTALLATION SHALL COMPLY WITH CALTRANS STANDARD SPECIFICATIONS SECTION 39-4.03, USING GRADE AR-4000 PAVING ASPHALT AS THE BINDER. BEFORE APPLYING BINDER, ALL VEGETATION SHALL BE REMOVED FROM THE EDGE OF PAVEMENT. CRACKS LARGER THAN 3/16 INCH MUST BE CLEANED WITH COMPRESSED AIR AND FILLED WITH SS1 ASPHALTIC EMULSION AND COVERED WITH SAND. ALL EXISTING THERMOPLASTIC LIMIT LINES, CROSSWALKS, AND LEGENDS APPLIED TO THE ROAD SURFACE SHALL BE SCARIFIED PRIOR TO PLACING THE OVERLAY. SCARIFICATION SHALL BE PERFORMED BY GRINDING SUCH THAT NO LESS THAN 20% OF THE UNDERLYING PAVEMENT IS EXPOSED. ALL MATERIAL RESULTING FROM THE GRINDING OPERATIONS OF TRAFFIC MARKINGS BECOMES THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED AND DISPOSED OF. LARGE CRACKS, SPALLS AND CHUCKHOLES IN EXISTING PAVEMENT SHALL BE REPAIRED. THE ENTIRE OVERLAY PAVING SURFACE SHALL BE FREE OF WATER AND SHALL BE SWEPT CLEAN IMMEDIATELY PRIOR TO BINDER APPLICATION.

PAVEMENT REINFORCING FABRIC SHALL BE PHILLIPS PETROMAT, AMOCO AMOPAVE, OR AN ENGINEER APPROVED EQUIVALENT. REQUESTS FOR FABRIC SUBSTITUTIONS WILL NOT BE ACCEPTED AFTER THE BID OPENING.

E. NO SAND SEAL IS REQUIRED.

F. ASPHALT PLANING SHALL BE PERFORMED BY A GRINDING-PROCESS, COLD PLANING MACHINE WHICH SHALL HAVE A MINIMUM CUTTING WIDTH OF 72-INCHES AND SHALL BE OPERATED SO AS NOT TO PRODUCE FUMES OR SMOKE. THE COLD PLANING MACHINE SHALL BE CAPABLE OF PLANING THE PAVEMENT WITHOUT REQUIRING THE USE OF A HEATING DEVICE TO SOFTEN THE PAVEMENT DURING OR PRIOR TO THE PLANING OPERATION. THE CONTRACTOR SHALL MAINTAIN ALL CUTTING TEETH TO INSURE A UNIFORM AND CLEAN CUT.

IN ALL CASES, THE CROSS-SECTIONAL PLANED SURFACE SHALL NOT VARY BY MORE THAN 1/4-INCH WHEN COMPARED TO A STRAIGHT EDGE. THE OUTSIDE LINES OF THE PLANED AREA SHALL BE NEAT AND UNIFORM AND THE REMAINING ROAD SURFACE SHALL NOT BE DAMAGED IN ANY WAY. WHERE THE COLD PLANING MACHINE LEAVES A "SLIVER" OF UNGROUNDED PAVEMENT AT THE LIP OF GUTTER, THAT "SLIVER" SHALL BE REMOVED BY HAND PRIOR TO PLACEMENT OF THE NEW ASPHALT CONCRETE.

STREETS TO BE OVERLAID SHALL BE COLD PLANED TO THE DEPTH BELOW THE EXISTING LIP OF GUTTER SPECIFIED ON THE PLANS AND TAPERED TO ZERO AT 6 FEET FROM THE LIP OF GUTTER. BOTH ENDS OF THE STREETS TO BE OVERLAID AND SIDE STREETS SHALL ALSO BE COLD PLANED AS SHOWN ON THE PLANS (CONFORM PLANING). THE CONFORM PLANING SHALL BE MADE IN A STRAIGHT-ACROSS PERPENDICULAR TO THE CENTER LINE OF THE STREET. ALL EXISTING ASPHALT ON CONCRETE GUTTERS ADJACENT TO PLANING SHALL ALSO BE REMOVED.

PAVEMENT FAILURE REPAIR WORK SHALL CONSIST OF GRINDING OUT EXISTING ASPHALT CONCRETE PAVEMENT AND REPLACING THE ASPHALT CONCRETE AS INDICATED ON THE PLANS. PAVEMENT REPAIRS WILL HAVE DIMENSIONS IN 6-FOOT INCREMENTS OF WIDTH TO ACCOMMODATE USE OF COLD PLANING MACHINE.

THE CONTRACTOR SHALL IMMEDIATELY REMOVE ALL PLANED MATERIAL FROM THE WORK SITE AND DISPOSE OF THE MATERIAL. THE REMOVAL CREW SHALL REMOVE ALL PLANED MATERIAL AND SWEEP CLEAN ALL PLANED AND ADJACENT SURFACES WHILE REMAINING WITHIN 100 FEET OF THE PLANER.

WHERE TRANSVERSE JOINTS ARE PLANED IN THE PAVEMENT AT CONFORM LINES, NO DROP-OFF SHALL REMAIN BETWEEN THE EXISTING PAVEMENT AND THE PLANED AREA WHEN THE PAVEMENT IS OPENED TO PUBLIC TRAFFIC. IF NEW ASPHALT CONCRETE HAS NOT BEEN PLACED TO THE LEVEL OF EXISTING PAVEMENT BEFORE THE PAVEMENT IS TO BE OPENED TO THE PUBLIC, A TEMPORARY PAVING RAMP SHALL BE PLACED TO THE LEVEL OF THE EXISTING PAVEMENT AND TAPERED ON A SLOPE OF 18:1 OR FLATTER TO THE LEVEL OF THE PLANED AREA. TEMPORARY RAMPS SHALL REMAIN IN PLACE NO LONGER THAN 7 DAYS.

ASPHALT CONCRETE FOR RAMPS SHALL BE COMMERCIAL QUALITY AND MAY BE SPREAD AND COMPACTED BY ANY METHOD THAT WILL PRODUCE A SMOOTH TRANSITION IN THE RIDING SURFACE. ASPHALT CONCRETE RAMPS SHALL BE COMPLETELY REMOVED, INCLUDING REMOVING ALL LOOSE MATERIAL FROM THE UNDERLYING SURFACE, BEFORE PLACING THE PERMANENT SURFACING. KRAFT PAPER, OR OTHER APPROVED BOND BREAKER, MAY BE PLACED UNDER THE TEMPORARY RAMPS TO FACILITATE THE REMOVAL OF THE RAMPS.

G. AC LIFT THICKNESS PER SECTION 39, CALTRANS STANDARD SPECIFICATIONS.

H. WHENEVER PAVEMENT IS BROKEN OR CUT IN THE INSTALLATION OF THE WORK COVERED BY THESE PLANS, THE PAVEMENT SHALL BE REPLACED, AFTER PROPER BACKFILLING, WITH PAVEMENT MATERIALS EQUAL TO OR BETTER THAN THE MATERIALS USED IN THE ORIGINAL PAVING. THE FINISHED PAVEMENT SHALL BE SUBJECT TO THE APPROVAL OF THE CITY ENGINEER OR CALTRANS, WHERE APPLICABLE.

I. ALL TRAFFIC DETECTOR LOOPS SHALL BE INSTALLED PRIOR TO PLACEMENT OF THE TOP LIFT OF AC PAVING. THERE SHALL BE NO CUTS IN THE TOP LIFT OF AC.

J. REFER TO GEOTECHNICAL REPORT FOR USE OF PULVERIZED CONCRETE AND ASPHALT PAVEMENT AS SUBBASE MATERIAL.

K. THE CONTRACTOR SHALL COORDINATE WITH ALL OTHER WORK TO ENSURE THAT ALL UNDERGROUND UTILITIES ARE INSTALLED PRIOR TO PAVING.

L. BETWEEN THE PLAN SPECIFIED GRADE CONTROL POINTS AND LINES, THE FINISHED PAVING SURFACE SHALL HAVE A UNIFORM SLOPE FROM SURFACE DRAINAGE HIGH POINTS AND RIDGE LINES TO GUTTERS AND DRAINAGE INLETS.

M. REFER TO "EARTHWORK" NOTES FOR SUBGRADE PREPARATION REQUIREMENTS.

N. WHEN NEW PAVING IS COMPLETED, IT SHALL BE SUBJECTED TO A FLOOD TEST SHOWING THE SURFACE FREE OF STANDING WATER OR PUDDLES. SHOULD ANY PUDDLING OCCUR, REPAVE IN SUCH A MANNER AS TO CORRECT THE PROBLEM. METHOD OF REPAVING SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL.

14. LANDSCAPING

A. FINISHED GRADE SHOWN ON CIVIL PLANS IS TOP OF FINISHED LANDSCAPE MATERIAL. ALL LANDSCAPE AREAS SHALL BE GRADED TO ACCOMMODATE THICKNESS OF LANDSCAPE MATERIALS SUCH THAT TOP OF LANDSCAPE MATERIALS DOES NOT BLOCK DRAINAGE.

B. AREAS WHERE LANDSCAPE IS ADJACENT TO HARDSCAPE, FINISHED GRADE OF LANDSCAPE MATERIAL SHALL BE DEPRESSED A MINIMUM OF 1" OR AS SHOWN ON PLANS.

C. ENGINEER SHALL VERIFY GRADING PRIOR TO PLACEMENT OF LANDSCAPE MATERIALS.

15. PIPELINES

A. ALL GRAVITY FLOW PIPELINES TO BE LAID UPGRADE FROM THE LOWEST POINT STARTING AT THE END OF EXISTING IMPROVEMENTS.

B. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 24 HOURS PRIOR TO BACKFILLING OF ANY PIPE WHICH STUBS TO A FUTURE PHASE OF CONSTRUCTION FOR INVERT VERIFICATION. TOLERANCE SHALL BE IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS.

C. UNLESS NOTED OTHERWISE, SITE PIPELINE LIMIT OF WORK AT BUILDING UTILITY POINT OF CONNECTION SHALL BE 5-FEET OUTSIDE THE BUILDING EXTERIOR WALL.

16. ADJUSTING EXISTING UTILITIES

A. THE CONTRACTOR SHALL ADJUST AND/OR RECONSTRUCT TO GRADE ALL EXISTING UTILITY STRUCTURES, INCLUDING VAULTS, BOXES AND MANHOLE FRAME AND COVER SETS, VALVE BOXES AND MONUMENT BOXES, WITHIN THE WORK AREA UNLESS NOTED OTHERWISE.

B. ALL MANHOLE FRAME AND COVER SETS, WATER VALVE BOXES AND MONUMENT BOXES WITHIN THE WORK AREA THAT DO NOT MEET CURRENT CITY REQUIREMENTS SHALL BE REMOVED AND REPLACED TO CONFORM TO CITY STANDARDS. THE CONTRACTOR SHALL COORDINATE THIS WORK WITH THE CITY INSPECTOR AND WITH THE ENGINEER.

17. SANITARY SEWER SYSTEM

A. UNLESS SPECIFIED OTHERWISE, ALL SEWER SERVICES SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY STANDARDS.

B. ALL SEWER SERVICES SHALL BE MARKED WITH A 2" X 2" STAKE AT THE END OF EACH SERVICE AND A 2 INCH HIGH "S" STAMPED IN THE TOP OF THE CURB.

C. ALL SEWER MAINS AND SERVICES SHALL BE AIR TESTED TO THE SATISFACTION OF THE ENGINEER AFTER AGGREGATE BASE PLACEMENT IS COMPLETED. SEWER PLUGS TO BE WING NUT TYPE, E-Z TEST OR APPROVED EQUIVALENT. MAINS SHALL BE BALLED AND FLUSHED PER CITY STANDARDS. PRIOR TO STARTING THE CLEANING OPERATION, A FINE MESH WIRE SCREEN SHALL BE PLACED AT THE EXTREME DOWNSTREAM MANHOLE TO PREVENT DEBRIS FROM ENTERING THE EXISTING CITY SEWER SYSTEM.

D. TV INSPECTION OF SEWERS, INCLUDING VIDEO RECORDINGS, SHALL BE PROVIDED BY THE CONTRACTOR. TV INSPECTION SHALL INCLUDE MAINS, SERVICES AND CLEANOUTS.

E. EACH STUB END PIPE SHALL BE PLUGGED WITH A PREFABRICATED, WATERTIGHT PLUG. PLUG SHALL BE GLADDING-MCBEAN SPEEDENSEAL CLAY STOPPER OR MISSION CLAY PRODUCTS STD. BAND-SEAL COUPLING WITH PLASTIC SHEAR RING AND ABS STOPPER. "POLYCAP" AND "SPEED-CAP" STOPPERS ARE NOT ACCEPTABLE.

F. BUILDING SEWER CLEANOUTS SHALL BE LOCATED AND INSTALLED IN ACCORD WITH THE UNIFORM PLUMBING CODE AND SHALL BE EXTENDED TO GRADE.

G. ALL GRAVITY SEWER PIPE WITHIN PUBLIC RIGHT OF WAY SHALL CONFORM WITH CITY STANDARDS.

H. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL SEWER LATERAL LOCATIONS WITH THE DESIGN ENGINEER PRIOR TO CONSTRUCTION.

18. STORM DRAIN SYSTEM

A. THE CONTRACTOR SHALL MAINTAIN ALL EXISTING DRAINAGE FACILITIES WITHIN THE CONSTRUCTION AREA UNTIL THE DRAINAGE IMPROVEMENTS ARE IN PLACE AND FUNCTIONING AND ACCEPTED BY THE CITY.

B. UNLESS NOTED OTHERWISE, ALL STORM DRAIN PIPE SHALL BE PRECAST REINFORCED CONCRETE PIPE, CAST-IN-PLACE CONCRETE PIPE (CIPP), PVC, OR HIGH DENSITY POLYETHYLENE PIPE (HDPE). ALL STORM DRAIN WITHIN PUBLIC RIGHT OF WAY SHALL CONFORM WITH CITY STANDARDS.

C. EACH STUB END PIPE SHALL BE PLUGGED WITH A PREFABRICATED, WATERTIGHT PLUG.

D. THE WALLS OF D.I.'S AND OF MANHOLES FUNCTIONING AS D.I.'S SHALL BE PERFORATED WITH 4 - 2 INCH DIAMETER HOLES PER WALL AT THE LEVEL OF THE BOTTOM OF THE AB UNDER THE ADJOINING PAVEMENT TO ALLOW FOR THE ESCAPE OF ANY WATER THAT MAY BUILD UP AROUND THE INLET.

E. CONTRACTOR SHALL MARK ALL NEW AND EXISTING STORM DRAIN INLETS WITH APPROVED POLLUTION PREVENTION MESSAGES. SPECIFIC PLACEMENT OF MARKERS WILL BE AS DIRECTED BY THE CITY INSPECTOR.

F. STORM DRAIN MANHOLES SHALL BE CONSTRUCTED PER CITY OF WOODLAND STANDARD DETAILS FOR PIPES SMALLER THAN 30" IN DIAMETER, AND PER CITY OF WOODLAND STANDARD DETAILS FOR PIPE 30" IN DIAMETER AND GREATER.

19. WATER SYSTEM

A. UNLESS SPECIFIED OTHERWISE, ALL WATER SERVICES SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY STANDARDS.

B. WATER LINE INSTALLATION SHALL ACCOMMODATE GRAVITY FLOW PIPELINES INCLUDING SEWER SERVICES AND SHALL MAINTAIN A MINIMUM COVER OF 4 FEET FROM FINISHED GRADE WITHIN THE PUBLIC RIGHT OF WAY AND 3 FEET IN ALL OTHER AREAS.

C. FIRE HYDRANT INSTALLATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY STANDARDS.

D. REDUCED PRESSURE BACK FLOW PREVENTION DEVICES FOR EACH LANDSCAPE IRRIGATION WATER SERVICE WILL BE INSTALLED BY THE LANDSCAPE IRRIGATION CONTRACTOR.

E. THE WATER DISTRIBUTION SYSTEM SHALL CONFORM TO THE CITY OF WOODLAND SPECIFIC PROVISIONS. PVC WATER MAIN FOR FIRE SYSTEM SHALL BE C900, CL 235. ALL T-BOLTS ON MECHANICAL JOINT FITTINGS AND MACHINE BOLTS ON FLANGE FITTINGS SHALL BE COATED WITH MASTIC AND WRAPPED IN 8 MIL PLASTIC. T-BOLTS, MACHINE BOLTS AND ALL THREAD RODS UNDER BUILDING SLABS SHALL BE STAINLESS STEEL WITH THE FITTING WRAPPED IN 8 MIL PLASTIC.

F. PROVIDE EXTERIOR CONTROL VALVES FOR EACH SPRINKLER SYSTEM (WALL MOUNTED P.I.V OR STANDARD P.I.V. PER FIRE PROTECTION PLANS.)

G. ALL ON-SITE FIRE MAINS SHALL BE PVC CLASS 235 C-900.

20. EXISTING SIGNS

A. THE PROTECTION AND MAINTENANCE OF EXISTING SIGNS AND THE REMOVAL, PROTECTION, STORAGE AND RESETTING OF CITY TRAFFIC SIGNS THAT ARE AFFECTED BY THE WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AS DIRECTED BY THE CITY ENGINEER. PRIVATE SIGNS, TRAFFIC SIGNS, AND TRAFFIC CONTROL FACILITIES EXISTING WITHIN THE LIMITS OF THE PROJECT SHALL NOT BE MOVED EXCEPT AS NECESSARY TO PREVENT THEM FROM BEING DAMAGED BY CONSTRUCTION OPERATIONS. WHEN A SIGN NEEDS TO BE REMOVED BECAUSE IT INTERFERES WITH THE CONTRACTOR'S WORK, IT SHALL BE DONE IN ONE OF THE FOLLOWING DESCRIBED MANNERS:

STOP SIGNS SHALL BE MAINTAINED IN THEIR EXISTING POSITIONS. ANY STOP SIGN WHICH MUST BE MOVED FROM ITS EXISTING POSITION AND REINSTALLED IN A NEW POSITION, MUST BE APPROVED BY THE CITY ENGINEER BEFORE SAID STOP SIGN IS MOVED

TRAFFIC SIGNS AND TRAFFIC CONTROL FACILITIES, OTHER THAN STOP SIGNS, NECESSARY FOR THE CONTROL OF TRAFFIC DURING THE PROJECT SHALL BE MAINTAINED IN PLACE IN AN UPRIGHT POSITION AND LOCATED SO AS TO PROPERLY CONTROL TRAFFIC. WHENEVER IT IS NECESSARY TO REMOVE THEM FROM THEIR PERMANENT LOCATION DUE TO CONSTRUCTION WORK, THEY SHALL BE REINSTALLED IN THEIR PERMANENT LOCATION AT THE EARLIEST POSSIBLE TIME. CONTROL OF TRAFFIC DURING THE TIME WHICH THE SIGNS ARE TEMPORARILY REMOVED SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

B. WHENEVER IT IS NECESSARY TO REMOVE A PRIVATELY OWNED SIGN OR A PUBLIC INFORMATION SIGN, ITS TEMPORARY RELOCATION AND ITS FINAL POSITIONING SHALL BE COORDINATED WITH THE SIGN OWNER AND, IF LOCATED WITHIN THE PUBLIC RIGHT-OF-WAY, WITH THE CITY ENGINEER.

21. MAILBOXES

MAILBOXES AND NEWSPAPER, IF ANY, TUBES WHICH ARE AFFECTED BY THE CONSTRUCTION SHALL BE REMOVED, TEMPORARILY RELOCATED AND FINALLY RESET. ALL MAILBOXES SHALL BE MAINTAINED IN AN UPRIGHT POSITION ADJACENT TO THE CONSTRUCTION AREA BETWEEN THE TIME THE MAILBOX IS REMOVED AND RESET IN ITS FINAL LOCATION. MAILBOXES SHALL BE RESET IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE LOCAL POSTMASTER; SUCH WORK SHALL BE COORDINATED WITH MAILBOX OWNERS.

22. PRESERVATION OF PROPERTY

TREES AND SHRUBBERY THAT ARE NOT TO BE REMOVED, AND POLE LINES, FENCES, SIGNS, SURVEY MARKERS AND MONUMENTS, BUILDINGS AND STRUCTURES, CONDUITS, PIPELINES, ALL STREET FACILITIES, AND ANY OTHER IMPROVEMENTS OR FACILITIES WITHIN OR ADJACENT TO THE STREET OR CONSTRUCTION AREA SHALL BE PROTECTED FROM INJURY OR DAMAGE, AND UPON ORDER BY THE CITY ENGINEER, THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN SAFEGUARDS SUCH AS PROTECTIVE FENCING OR OTHER SUITABLE BARRIERS APPROVED BY THE CITY ENGINEER TO PROTECT SUCH OBJECTS FROM INJURY OR DAMAGE. IF SUCH OBJECTS ARE INJURED OR DAMAGED BY REASON OF THE CONTRACTOR'S OPERATIONS, THEY SHALL BE REPLACED OR RESTORED AT THE CONTRACTOR'S EXPENSE. THE FACILITIES SHALL BE REPLACED OR RESTORED TO A CONDITION AS GOOD AS WHEN THE CONTRACTOR ENTERED UPON THE WORK, OR AS GOOD AS REQUIRED BY THE SPECIFICATION ACCOMPANYING THE CONTRACT, IF ANY SUCH OBJECTS ARE A PART OF THE WORK BEING PERFORMED UNDER CONTRACT. THE CITY ENGINEER MAY MAKE OR CAUSE TO BE MADE SUCH TEMPORARY REPAIRS AS ARE NECESSARY TO RESTORE TO SERVICE ANY DAMAGED FACILITY. THE COST OF SUCH REPAIRS SHALL BE BORNE BY THE CONTRACTOR.

23. RECORD DRAWINGS

A. "RECORD DRAWINGS" IS DEFINED AS BEING THOSE DRAWINGS MAINTAINED BY THE CONTRACTOR TO SHOW THE CONSTRUCTION OF A PARTICULAR STRUCTURE OR WORK AS ACTUALLY COMPLETED UNDER THE CONTRACT. "RECORD DRAWINGS" SHALL BE SYNONYMOUS WITH "AS-BUILT DRAWINGS", AS REQUIRED BY THE ENGINEER, THE CONTRACTOR SHALL PROVIDE THE ENGINEER ACCURATE INFORMATION TO BE USED IN THE PREPARATION OF PERMANENT RECORD DRAWINGS. FOR THIS PURPOSE, THE CONTRACTOR SHALL RECORD ON ONE SET OF CONTRACT DRAWING PRINTS ALL CHANGES FROM INSTALLATIONS ORIGINALLY INDICATED, AND RECORD FINAL LOCATIONS OF UNDERGROUND LINES BY DEPTH FROM FINISH GRADE AND BY ACCURATE HORIZONTAL OFFSET DISTANCES TO PERMANENT SURFACE IMPROVEMENTS SUCH AS BUILDINGS, CURBS OR EDGES OF WALKS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL AS-BUILT INFORMATION PREPARED BY SUBCONTRACTORS IS INCLUDED IN HIS RECORD DRAWINGS.

B. THE CONTRACTOR SHALL MAINTAIN AT LEAST ONE COMPLETE SET OF UPDATED "RECORD DRAWING" IMPROVEMENT PLAN PRINTS. THESE PRINTS SHALL BE READILY AVAILABLE TO THE CITY AND TO THE ENGINEER. UPON COMPLETION OF THE PROJECT, AND PRIOR TO FINAL PAYMENT, THESE RECORD DRAWING PRINTS SHALL BE SUBMITTED TO THE ENGINEER.

24. INSURANCE

CONTRACTOR SHALL MAINTAIN SUCH INSURANCE AS WILL PROTECT IT FROM CLAIMS UNDER WORKERS' COMPENSATION ACTS AND FROM CLAIMS FOR DAMAGES BECAUSE OF BODILY INJURY, INCLUDING DEATH, OR INJURY TO PROPERTY WHICH MAY ARISE FROM AND DURING THE OPERATION OF THIS CONTRACT. INSURANCE COVERAGE SHALL INCLUDE PROVISION OR ENDORSEMENT NAMING THE OWNER, THE ENGINEER AND HIS CONSULTANTS, AND EACH OF THEIR OFFICERS, EMPLOYEES AND AGENTS. EACH AS ADDITIONAL INSURED IN REGARDS TO LIABILITY ARISING OUT OF THE PERFORMANCE OF ANY WORK UNDER THE CONTRACT. A CERTIFICATE OF SUCH INSURANCE SHALL BE FURNISHED TO THE OWNER PRIOR TO COMMENCEMENT OF ANY WORK.

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REGISTERED PROFESSIONAL ENGINEER · BRYAN P. BONINO · No. 41804 · CIVIL · STATE OF CALIFORNIA

BY BRYAN P. BONINO
DATE 04/11/2024 P.E. 41804

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
GENERAL NOTES
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

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SHEET	C003

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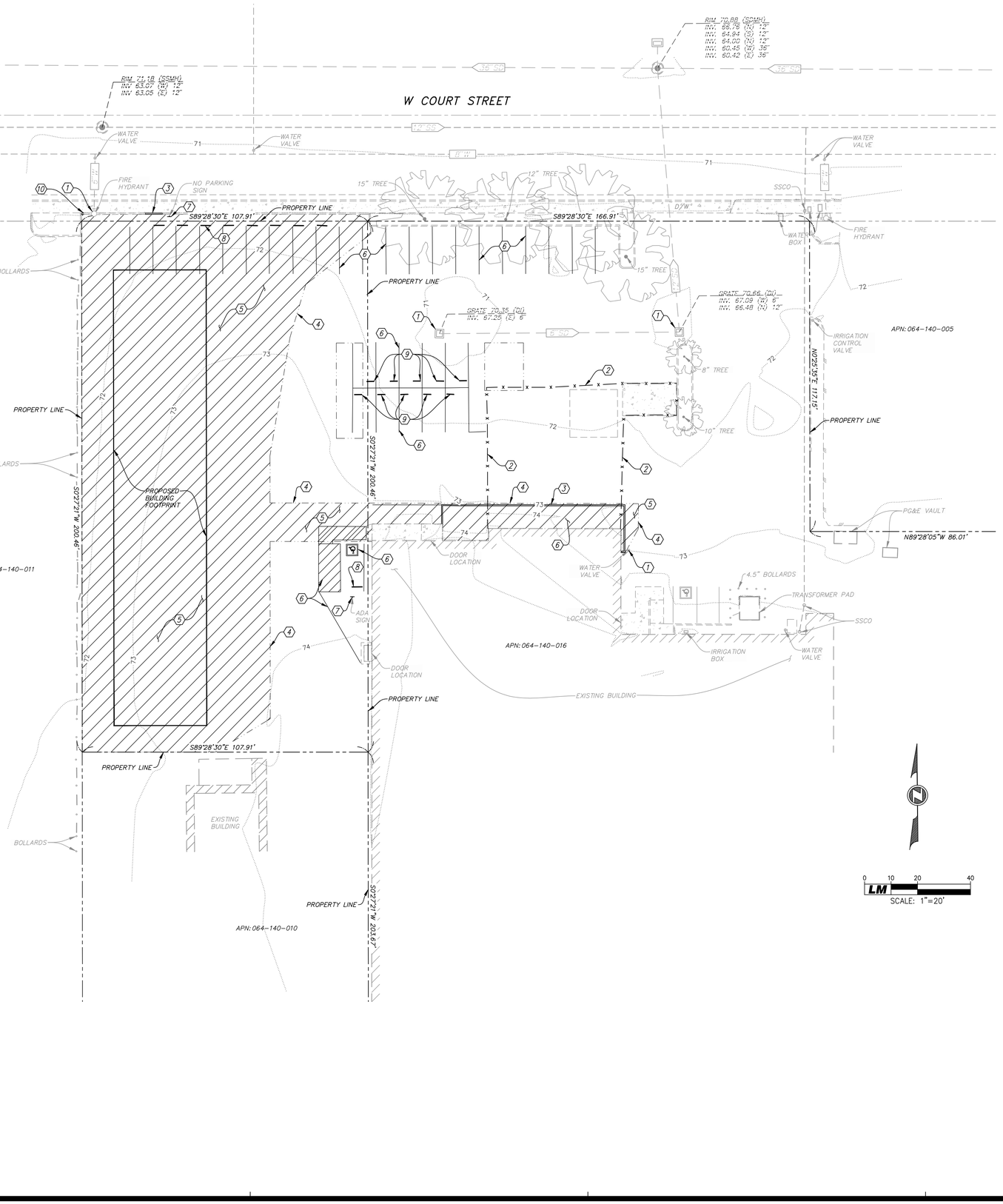

GENERAL NOTES:

A. CONTRACTOR SHALL POTHOLE AND VERIFY DEPTHS AND LOCATIONS OF EXISTING UTILITIES AS FIRST ITEM OF WORK, AND NOTIFY ENGINEER OF ANY CONFLICTS.

B. CONTRACTOR SHALL COORDINATE UTILITY SHUTOFFS AND TERMINATIONS WITH UTILITY COMPANIES. CONTRACTOR SHALL PROVIDE PROOF OF SHUTOFFS PRIOR TO BEGINNING WORK.

C. THE CONTRACTOR SHALL REMOVE ALL OBSTRUCTIONS, BOTH ABOVE AND BELOW GROUND AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS. WHEN FEASIBLE SUCH WORK SHALL BE COMPLETED PRIOR TO GRADING.

D. ALL UNSUITABLE AND SURPLUS MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UNLESS SPECIFIED OTHERWISE.

E. WHERE EXISTING LANDSCAPE AREAS ARE DISTURBED, REPLACE IN KIND OR EXTEND AS REQUIRED TO MATCH EXISTING.

F. THE CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLES, VAULTS, AND VALVE BOXES WITHIN THE WORK AREA TO GRADE, EVEN THOSE THAT MAY NOT SPECIFICALLY BE NOTED. ALL DAMAGED BOXES SHALL BE REPLACED WITH NEW BOXES.

G. PROTECT DRAINAGE SYSTEM WITH STORM WATER BMP's PER CASQA CALIFORNIA STORMWATER BMP HANDBOOK FOR CONSTRUCTION ACTIVITIES.

CONSTRUCTION NOTES:

1. PROTECT EXISTING UTILITY DURING CONSTRUCTION OR ADJUST TO GRADE AS DETERMINED IN FIELD.
2. EXISTING FENCE TO BE REMOVED. LIMITS TO BE VERIFIED WITH ARCHITECT.
3. EXISTING CURB TO BE REMOVED AND REPLACED. SEE SHEET C201 FOR IMPROVEMENT PLAN.
4. PAVEMENT REMOVAL LINE, SAWCUT (— · — · — · — · — · —).
5. HATCHING DENOTES EXISTING AC, AB, AND DIRT MATERIAL TO BE REMOVED TO FULL SECTION DEPTH. CLEAN AB AND GROUND AC MAY BE USED FOR FILL MATERIAL UNDER PROPOSED BUILDING IF APPROVED BY GEOTECHNICAL ENGINEER.
6. EXISTING STRIPING IN CONFLICT WITH NEW PARKING LAYOUT TO BE REMOVED. SEE ARCHITECTURAL PLAN FOR PROPOSED STRIPING PLAN.
7. EXISTING SIGN TO BE REMOVED.
8. EXISTING WHEEL STOP TO BE REMOVED (TYPICAL).
9. EXISTING WHEEL STOP TO REMAIN AND BE PROTECTED DURING CONSTRUCTION.
10. SAWCUT AND REMOVE 1-FOOT WIDE GAP AT EXISTING CURB AT BACK EDGE OF SIDEWALK FOR OVERLAND RELEASE.

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BY BRYAN P. BONINO DATE 04/11/2024 P.E. 41804

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
TOPOGRAPHIC SURVEY & DEMOLITION PLAN
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

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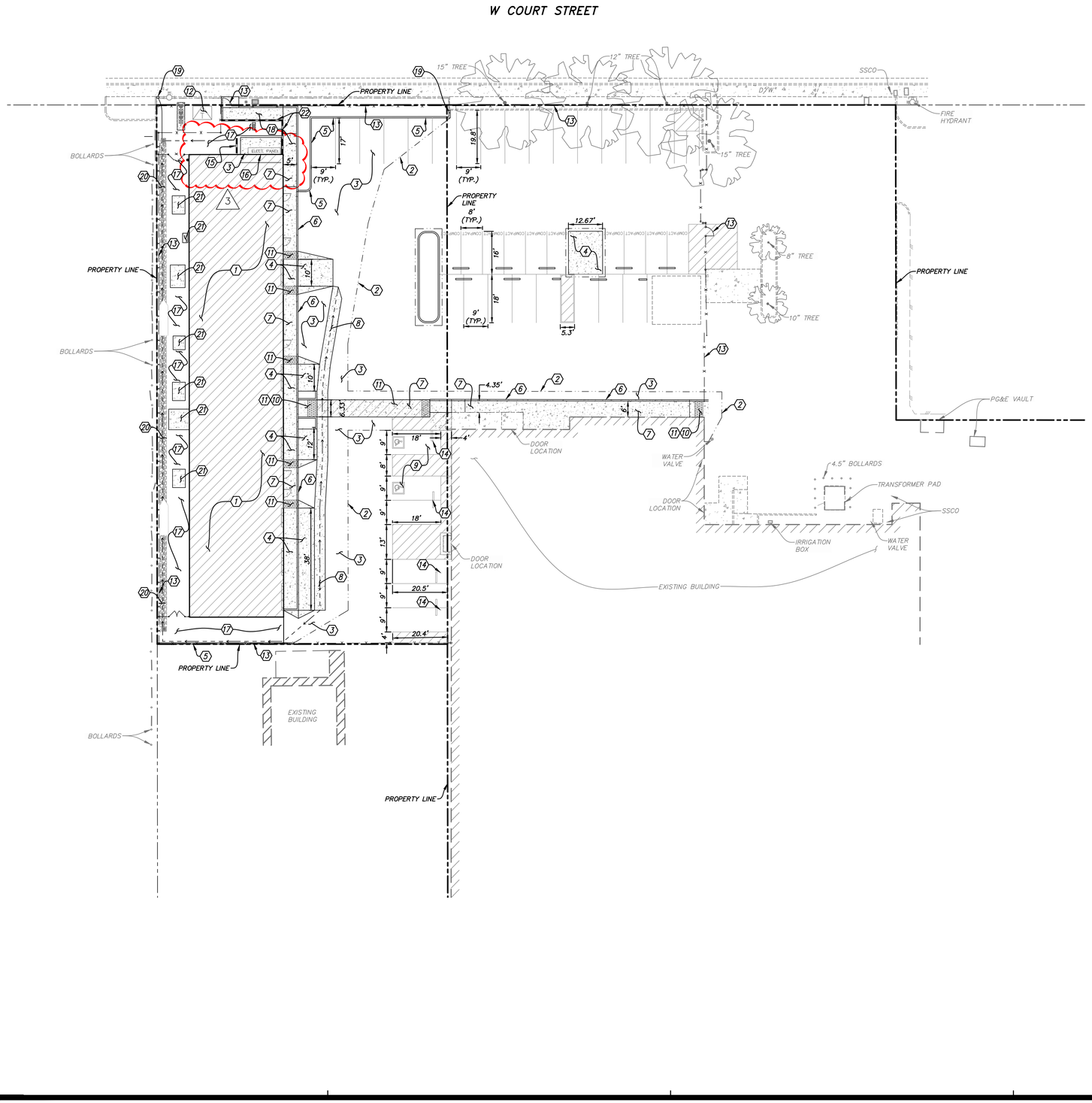

GENERAL NOTES:

A. SEE ARCHITECTURAL PLANS FOR PARKING DETAILS AND COUNTS.

B. 4" WIDE WHITE STANDARD PAINTED PARKING STALL STRIPES (TYPICAL). VERIFY WITH ARCHITECTURAL SITE PLAN.

C. SEE ARCHITECTURAL PLAN FOR FIRE LANE MARKINGS. FIELD VERIFY FIRE LANES WITH FIRE MARSHALL PRIOR TO SIGNING AND STRIPING.

D. SEE ARCHITECTURAL PLANS FOR ACCESSIBLE PARKING STALL AND SIGNAGE DETAILS.

E. PCC SLABS SHOULD BE CONSTRUCTED WITH THICKENED EDGES PER DETAILS ON SHEET C701.

CONSTRUCTION NOTES:

1. BUILDING PAD PER ARCHITECTUAL AND STRUCTURAL PLANS. VERIFY OVER BUILD, FOOTING EXCAVATION & COMPACTION REQUIREMENTS WITH STRUCTURAL PLANS. VERIFY PAD SECTION PRIOR TO STAKING/GRADING.
2. PAVEMENT REMOVAL LINE, SAWCUT (— · — · — · —).
3. PAVEMENT WITHIN SAWCUT TO BE REMOVED TO FULL DEPTH AND REPLACED WITH SECTION MATCHING EXISTING PARKING LOT SECTION OR 4" A.C. OVER 12" A.B., WHICHEVER IS GREATER. SEE SHEET C301 FOR DESIGN GRADES.
4. INSTALL 6" P.C.C. AND 6" A.B. OVER COMPACTED SUBGRADE IN SHOP ACCESS RAMP AREA AND TRASH ENLOSURE AREA. SEE AMERICAN CONCRETE INSTITUTE STANDARDS FOR COMPACTION, CONCRETE REINFORCEMENTS, AND CONTROL JOINT REQUIREMENTS.
5. INSTALL VERTICAL CURB PER DETAIL 1, SHEET C702.
6. INSTALL 4" MONOLITHIC CURB AND SIDEWALK PER DETAIL 2, SHEET C702.
7. INSTALL CONCRETE SIDEWALK PER DETAIL 3, SHEET C702.
8. INSTALL 4' VALLEY GUTTER PER DETAIL 4, SHEET C702.
9. SEE SHEET C702, CALTRANS STANDARD PLAN A90A, FOR ACCESSIBLE PARKING AND SIGNAGE DETAILS IN ADA PARKING AREA.
10. SEE CALTRANS STANDARD PLAN A88A FOR CASE F CURB RAMP INSTALLATION ON SHEET C702.
11. INSTALL TRUNCATED DOMES PER CALTRANS STANDARD PLAN A88A (ARMOR TILE OR APPROVED EQUIVALENT). SEE SHEET C702.
12. INSTALL TRANSFORMER PER ARCHITECTURAL AND ELECTRICAL PLANS.
13. INSTALL FENCE AND GATES PER ARCHITECTURAL PLANS.
14. INSTALL WHEEL STOP PER ARCHITECTURAL PLANS.
15. INSTALL SCREEN WALL PER ARCHITECTURAL PLANS. (3)
16. ELECTRICAL PANEL INSTALLED BY OTHERS.
17. INSTALL 6" THICK, 3/4" CRUSHED ROCK SECTION FOR NON-VEHICLE ACCESS AREAS OVER 6" COMPACTED SUBGRADE AT 82-90% M.R.C.
18. INSTALL RAMP WITH RAILS AND CURBS/WALLS PER ARCHITECTURAL PLAN. SEE SHEET C301 FOR DESIGN GRADES.
19. 12" GAP FOR OVERLAND RELEASE.
20. INSTALL INFILTRATION TRENCH PER DETAIL 1, SHEET C501.
21. UTILITY PAD PER ELECTRICAL/MECHANICAL/PLUMBING PLANS.
22. DEEPENED CURB OR WALL TO EXTEND 18" BELOW LOWEST GRADE (- - - - - - - - -).

0 10 20 40
SCALE: 1"=20'

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JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
CIVIL SITE PLAN
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

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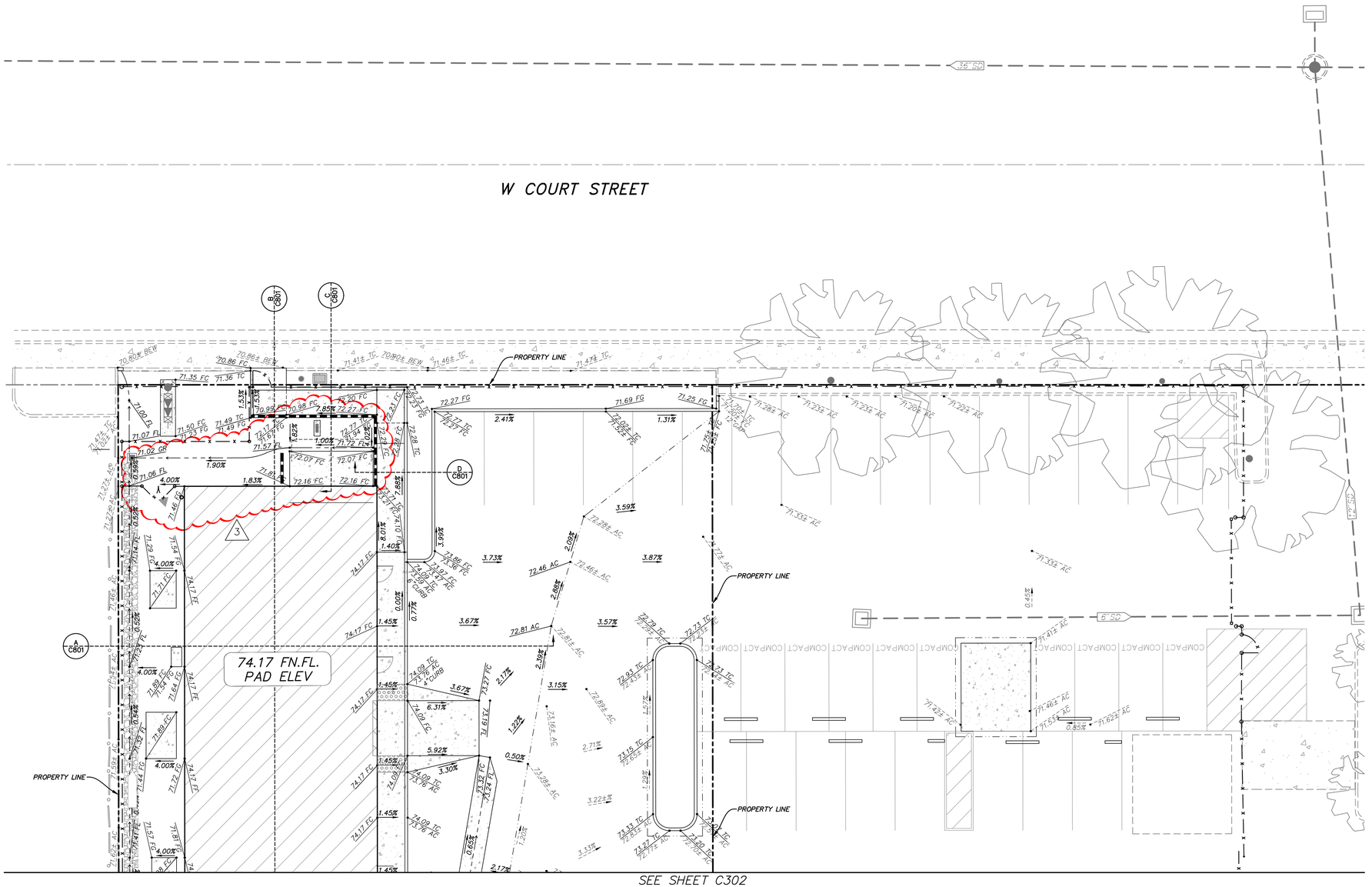

GENERAL GRADING NOTES:

A. ALL EARTHWORK ACTIVITIES, INCLUDING EXCAVATION, GRADING, SCARIFYING, MOISTURIZING, FILL PLACEMENT, COMPACTION, ETC., SHALL BE PERFORMED IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE PROJECT GEOTECHNICAL ENGINEERING REPORT AND IN CONFORMANCE WITH THE COUNTY STANDARD SPECIFICATIONS, AND WITH THE GRADING PLAN.

B. THE GEOTECHNICAL ENGINEER SHALL OBSERVE THE GRADING ACTIVITIES AND PERFORM COMPACTION TESTING FOR THIS PROJECT. THE CONTRACTOR SHALL PROVIDE AT LEAST 24 HOURS NOTICE TO THE GEOTECHNICAL ENGINEER OF THE NEED FOR OBSERVATION AND TESTING SERVICES. THE PROJECT OWNER WILL PAY FOR THE COST OF PROVIDING THESE SERVICES; HOWEVER, IF SAMPLES OF MATERIALS ARE SUBMITTED WHICH FAIL TO PASS THE SPECIFIED TESTS OR IF WORK IS PERFORMED WHICH FAILS TO MEET THESE SPECIFICATIONS, THE CONTRACTOR SHALL PAY FOR ALL SUBSEQUENT RE-TESTS AND RE-INSPECTIONS.

C. EARTHWORK SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO CONSTRUCT THE SITE TO THE GRADES SHOWN. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THE DISPOSAL OF EXCESS EXCAVATION OR FOR THE IMPORT OF MATERIAL.

D. TO ACCOMMODATE TRENCH AND FOUNDATION SPOILS, THE CONTRACTOR'S GRADING SHALL INCLUDE UNDERCUTTING OF PAVED AREAS AS APPROPRIATE, OR SOME OTHER METHOD APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THE DISPOSAL OF EXCESS EXCAVATION OR FOR THE IMPORT OF MATERIAL.

E. ALL CUT SLOPES SHALL BE ROUNDED AT THE "BREAK" SO THAT THEY BLEND WITH THE NATURAL GROUND CONTOUR.

F. WHERE NEW IMPROVEMENTS (CURB, GUTTER, SIDEWALK, PAVEMENT, ASPHALT, ETC.) ARE DESIGNATED TO MATCH GRADE (±) AT EXISTING IMPROVEMENTS, THE CONTRACTOR SHALL VERIFY THE MATCH POINT GRADES, REPORT ANY DISCREPANCIES AND ADJUST GRADES TO MATCH EXISTING.

REGISTERED PROFESSIONAL ENGINEER BRYAN P. BONINO No. 41804 CIVIL STATE OF CALIFORNIA

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BY BRYAN P. BONINO
DATE 04/11/2024 P.E. 41804

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
GRADING & DRAINAGE PLAN
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:		
	DATE:	DESCRIPTION:
2	07-29-2024	ALL ELECTRIC
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DATE	01.08.24
DRAWN	-
JOB NO.	464-81
SHEET	C301
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GENERAL GRADING NOTES:

A. ALL EARTHWORK ACTIVITIES, INCLUDING EXCAVATION, GRADING, SCARIFYING, MOISTURIZING, FILL PLACEMENT, COMPACTION, ETC., SHALL BE PERFORMED IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE PROJECT GEOTECHNICAL ENGINEERING REPORT AND IN CONFORMANCE WITH THE COUNTY STANDARD SPECIFICATIONS, AND WITH THE GRADING PLAN.

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BY BRYAN P. BONINO

DATE 04/11/2024 P.E. 41804

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
GRADING & DRAINAGE PLAN
120 W. MAIN STREET
WOODLAND, CA

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GENERAL NOTES:

A. CONTRACTOR SHALL POTHOLE AND VERIFY DEPTHS AND LOCATIONS OF EXISTING UTILITIES ALONG THE PROPOSED UTILITY ALIGNMENTS AS FIRST ITEM OF WORK, AND NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.

B. ALL UNSUITABLE AND SURPLUS MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UNLESS SPECIFIED OTHERWISE. VERIFY WITH OWNER POTENTIAL ONSITE DISPOSAL AREAS.

C. PROTECT DRAINAGE SYSTEM WITH STORM WATER BMP's PER CASQA CALIFORNIA STORMWATER BMP HANDBOOK FOR CONSTRUCTION ACTIVITIES.

D. INSTALL THRUST BLOCKS OR RESTRAINED JOINTS AT ALL WATER FITTINGS PER CITY OF WOODLAND STANDARD DETAILS 0750, 0753, 0754 AND 0755. (▽ – TYPICAL)

CONSTRUCTION NOTES:

1. INSTALL 6" FIRE MAIN PER DETAIL 8, SHEET C701. FIRE SERVICE SHALL BE POLYVINYL CHLORIDE (PVC), MANUFACTURED IN ACCORDANCE WITH AWWA C900, PRESSURE CLASS 235, DR–18, (4–INCH THROUGH 12–INCH FOR ALL UNDERGROUND FIRE SYSTEMS).
2. REFER TO OFFSITE IMPROVEMENT PLANS FOR CONTINUATION AND CONNECTION TO DOUBLE CHECK DETECTOR ASSEMBLY AND FIRE DEPARTEMENT CONNECTION.
3. REFER TO OFFISTE IMPROVEMENT PLANS FOR CONTINUATION AND CONNECTION TO SEWER CLEANOUT.
4. REFER TO OFFSITE IMPROVEMENT PLANS FOR CONTINUATION AND CONNECTION TO BACKFLOW PREVENTER & METER.
5. INSTALL 15 LF OF 6" SEWER AT 2.00% MIN. SLOPE.

△3 6. BLANK

7. INSTALL 180 LF OF 8" PERFORATED STORM DRAIN IN INFILTRATION TRENCH. INSTALL INFILTRATION TRENCH PER DETAIL 1, SHEET C501.
8. INSTALL CENTRAL PRECAST CP1212 DRAINAGE INLET OR APPROVED EQUIVALENT WITH STANDARD H–20 GRATE OR LID AS NOTED ON THE PLANS.

0 10 20 40
SCALE: 1"=20'

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JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
UTILITIES PLAN
120 W. MAIN STREET
WOODLAND, CA

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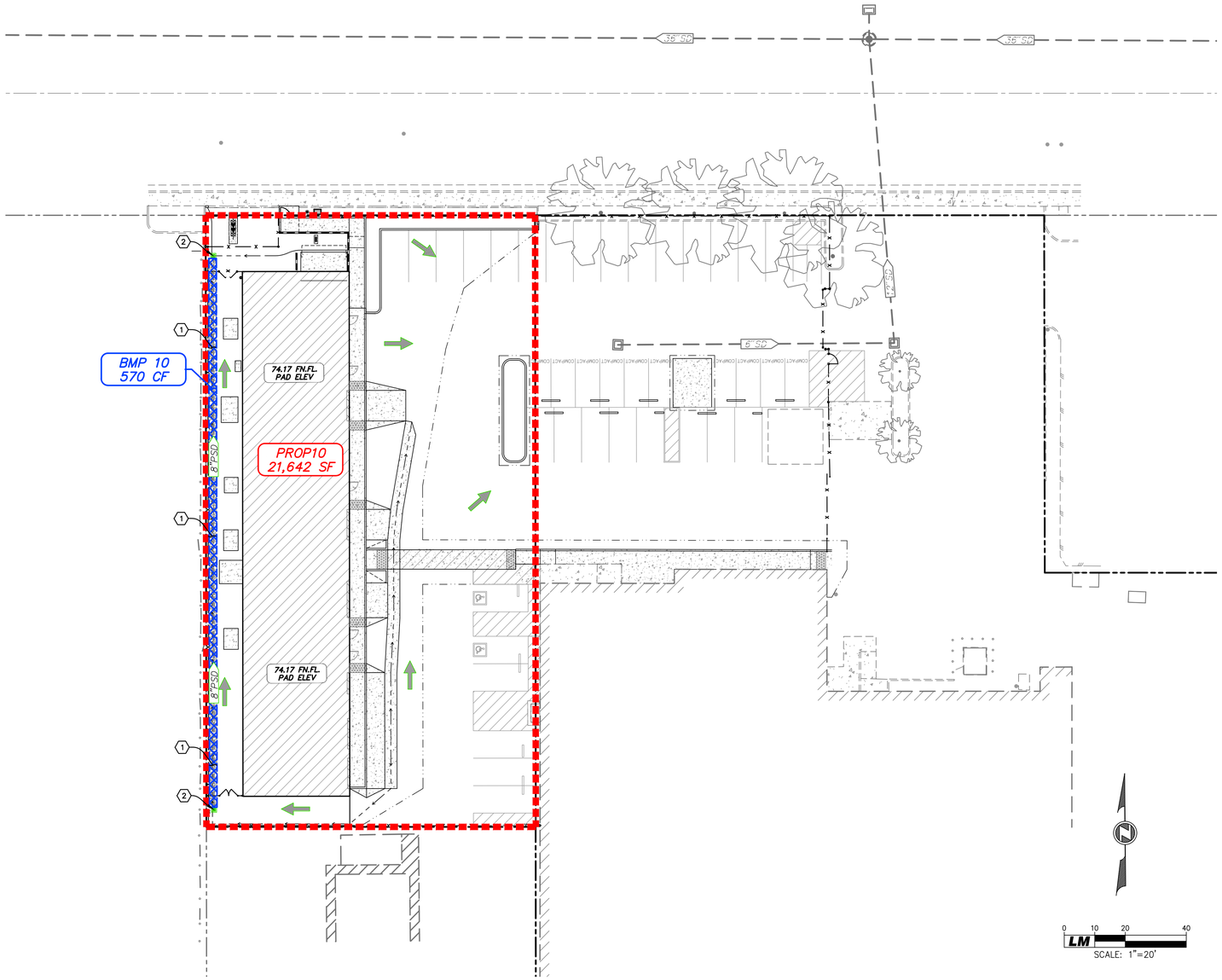


GENERAL NOTES:

A. SOILS ARE GROUP B, PER USDA SOIL MAP VIEWER REPORT.

B. SITE DRAINS TO CITY STORM DRAIN SYSTEM.

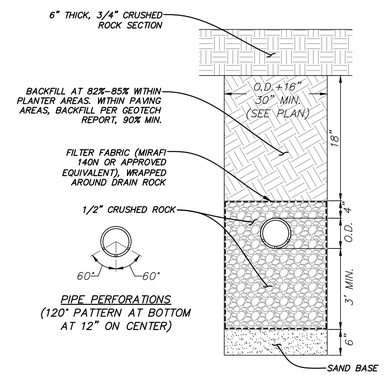
C. SITE IS NOT IN A FEMA SPECIAL FLOOD HAZARD ZONE.

TREATMENT CONTROL MEASURES ⬡ :

1. INSTALL INFILTRATION TRENCH FACILITY PER DETAIL 1 ON THIS SHEET. SEE GRADING PLAN, SITE PLAN, UTILITY PLAN, AND LANDSCAPING PLAN FOR MORE DETAIL.
2. INSTALL ADS FLEXSTORM PURE FULL TRASH CAPTURE INSERTS OR APPROVED EQUIVALENT THAT IS CERTIFIED AS FULL TRASH CAPTURE SYSTEM BY THE STATE WATER RESOURCES CONTROL BOARDS.

LEGEND

DMA	DRAINAGE MANAGEMENT AREA
BMP	BEST MANAGEMENT PRACTICE
DMA 1 1,000 SF	WATER QUALITY AREA NAME AND SQUARE FOOTAGE
	WATER QUALITY AREA BOUNDARY
BMP 1 1,000 CF	BEST MANAGEMENT PRACTICE AREA NAME AND STORAGE VOLUME
	INFILTRATION TRENCH
	DIRECTION OF FLOW



PIPE PERFORATIONS
(120° PATTERN AT BOTTOM AT 12" ON CENTER)

TYPICAL TRENCH SECTION

NOTES:

1. SOIL MOISTURE LOW ENOUGH DURING CONSTRUCTION TO PREVENT SMEARING OF TRENCH SIDES AND BOTTOM. IF SMEARING OCCURS CONTRACTOR SHALL SCORE TRENCH TO PROMOTE INFILTRATION TO THE SATISFACTION OF THE ENGINEER.
2. TRENCH BOTTOM TO BE LEVEL PLUS OR MINUS THREE INCHES ALONG THE ENTIRE LENGTH OF PERFORATE PIPE.
3. SIDE WALLS TO BE SCORED TO PREVENT SEALING.

1 INFILTRATION TRENCH
NTS

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BY BRYAN P. BONINO DATE 04/11/2024 P.E. 41804

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
STORMWATER CONTROL PLAN
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

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SHEET	C501

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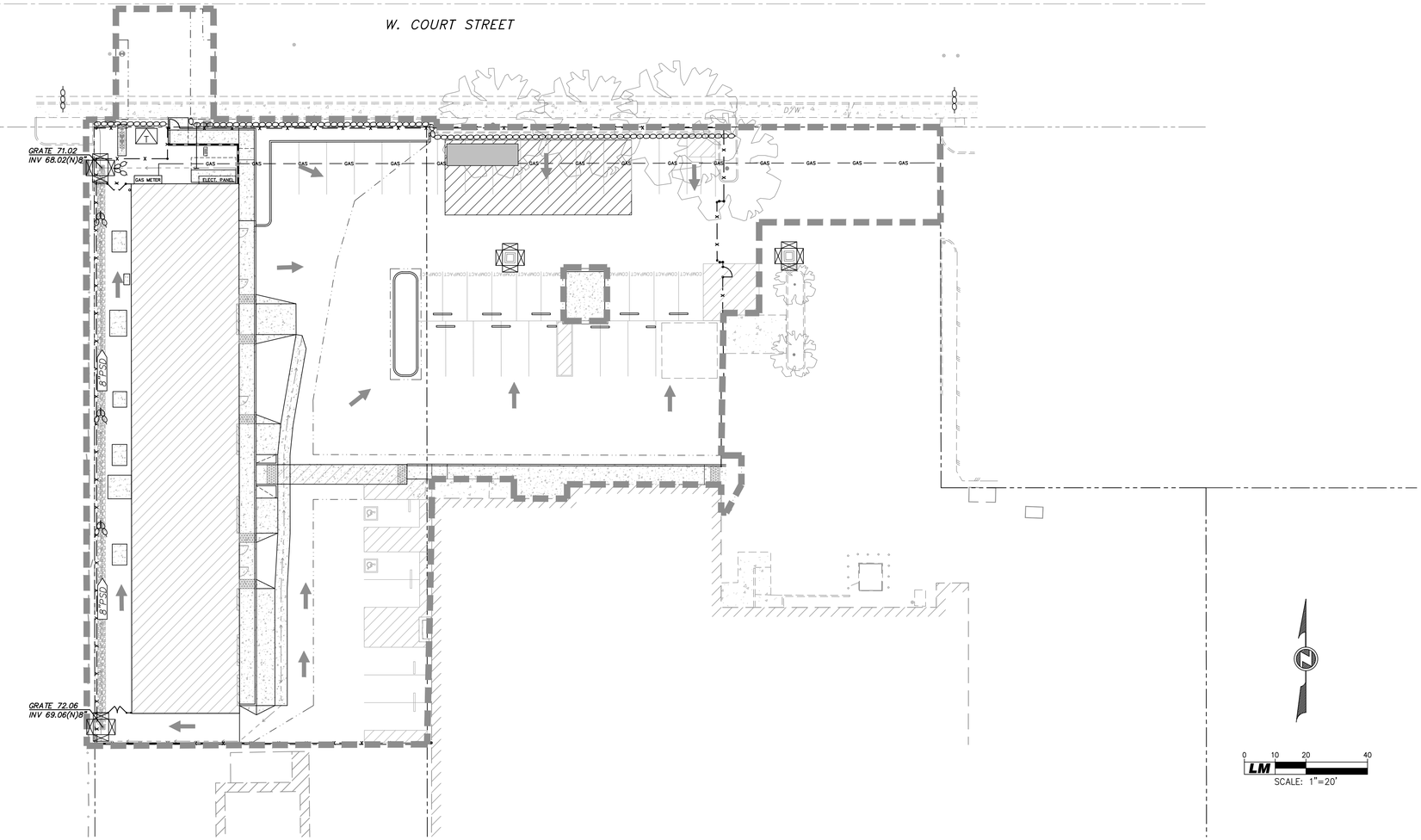

SITE BMP's

CASQA FACT SHEET	BMP NAME	REQUIRED
EC-1	SCHEDULING	✓
EC-2	PRESERVATION OF EXISTING VEGETATION	✓
EC-3	HYDRAULIC MULCH	
EC-4	HYDROSEEDING	✓
EC-5	SOIL BINDERS	
EC-6	STRAW MULCH	
EC-7	GEOTEXTILES AND MATS	
EC-8	WOOD MULCHING	
EC-9	EARTH DIKES AND DRAINAGE SWALES	
EC-10	VELOCITY DISSIPATION DEVICES	
EC-11	SLOPE DRAINS	
EC-12	STREAMBANK STABILIZATION	
EC-14	COMPOST BLANKET	
EC-15	SOIL PREPARATION/ROUGHENING	✓
EC-16	NON-VEGETATIVE STABILIZATION	
WE-1	WIND EROSION CONTROL	✓
SE-1	SILT FENCE	
SE-2	SEDIMENT BASIN	
SE-3	SEDIMENT TRAP	
SE-4	CHECK DAMS	
SE-5	FIBER ROLLS	✓
SE-6	GRAVEL BAG BERM	✓
SE-7	STREET SWEEPING AND VACUUMING	✓
SE-8	SANDBAG BARRIER	
SE-9	STRAW BALE BARRIER	
SE-10	STORM DRAIN INLET PROTECTION	✓
SE-11	ACTIVE TREATMENT SYSTEM (ATS)	
SE-12	TEMPORARY SILT DIKE	
SE-13	COMPOST SOCKS AND BERMS	
SE-14	BIOFILTER BAGS	
TC-1	STABILIZED CONSTRUCTION ENTRANCE/EXIT	
TC-2	STABILIZED CONSTRUCTION ROADWAY	
TC-3	ENTRANCE/OUTLET TIRE WASH	
NS-1	WATER CONSERVATION PRACTICES	✓
NS-2	DEWATERING OPERATIONS	
NS-3	PAVING AND GRINDING OPERATIONS	✓
NS-4	TEMPORARY STREAM CROSSING	
NS-5	CLEAR WATER DIVERSION	
NS-6	ILLICIT CONNECTION/DISCHARGE	✓
NS-7	POTABLE WATER/IRRIGATION	
NS-8	VEHICLE AND EQUIPMENT CLEANING	
NS-9	VEHICLE AND EQUIPMENT FUELING	✓
NS-10	VEHICLE & EQUIPMENT MAINTENANCE	✓
NS-11	PILE DRIVING OPERATIONS	
NS-12	CONCRETE CURING	✓
NS-13	CONCRETE FINISHING	✓
NS-14	MATERIAL OVER WATER	
NS-15	DEMOLITION ADJACENT TO WATER	
NS-16	TEMPORARY BATCH PLANTS	
WM-1	MATERIAL DELIVERY AND STORAGE	✓
WM-2	MATERIAL USE	✓
WM-3	STOCKPILE MANAGEMENT	✓
WM-4	SPILL PREVENTION AND CONTROL	✓
WM-5	SOLID WASTE MANAGEMENT	✓
WM-6	HAZARDOUS WASTE MANAGEMENT	✓
WM-7	CONTAMINATED SOIL MANAGEMENT	
WM-8	CONCRETE WASTE MANAGEMENT	✓
WM-9	SANITARY/SEPTIC WASTE MANAGEMENT	✓
WM-10	LIQUID WASTE MANAGEMENT	

LEGEND:

- STORM DRAIN INLET PROTECTION PER CASQA SE-10
- LIMIT OF CLEARING AND GRADING
- DRAINAGE FLOW
- STABILIZED CONSTRUCTION ENTRANCE PER CASQA TC-1
- CONCRETE WASHOUT PIT MATERIAL PER CASQA WM-8 WITH POSTED SIGNS
- FIBER ROLL PER CASQA SE-5
- PLANNED STAGING, MATERIAL AND WASTE STORAGE AREA AND SOLID WASTE STORAGE AREA PER CASQA WM-1 TO WM-5
- TP-1 — SAMPLING TEST POINT
- SSD # — SITE STORMWATER DISCHARGE LOCATION

EROSION CONTROL NOTES:

1. ALL WORK SHALL CONFORM TO THE CURRENT CITY OF WOODLAND STANDARD SPECIFICATIONS AND ALL APPLICABLE ADDENDA.
2. CONTRACTOR MUST ENSURE THAT THE CONSTRUCTION SITE IS PREPARED PRIOR TO THE ONSET OF ANY STORM. CONTRACTOR SHALL HAVE ALL EROSION AND SEDIMENT CONTROL MEASURES IN PLACE PRIOR TO ANY CONSTRUCTION ACTIVITIES.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL DISTURBED AREAS ARE STABILIZED. CHANGES TO THIS EROSION AND SEDIMENT CONTROL PLAN SHALL BE MADE TO MEET FIELD CONDITIONS ONLY WITH THE APPROVAL OF OR AT THE DIRECTION OF A REPRESENTATIVE OF THE DEPARTMENT OF UTILITIES.
4. THIS PLAN MAY NOT COVER ALL THE SITUATIONS THAT ARISE DURING CONSTRUCTION DUE TO UNANTICIPATED FIELD CONDITIONS. VARIATIONS MAY BE MADE TO THE PLAN IN THE FIELD SUBJECT TO THE APPROVAL OF OR AT THE DIRECTION OF A REPRESENTATIVE OF THE DEPARTMENT OF UTILITIES.
5. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED BEFORE AND AFTER ALL STORMS TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
6. CONTRACTOR SHALL MAINTAIN A LOG AT THE SITE OF ALL INSPECTIONS OR MAINTENANCE OF BMP'S, AS WELL AS, ANY CORRECTIVE CHANGES TO THE BMP'S OR EROSION AND SEDIMENT CONTROL PLAN.
7. IN AREAS WHERE SOIL IS EXPOSED, PROMPT REPLANTING WITH NATIVE COMPATIBLE, DROUGHT-RESISTANT VEGETATION SHALL BE PERFORMED. NO AREAS WILL BE LEFT EXPOSED OVER THE WINTER SEASON.
8. THE CONTRACTOR SHALL INSTALL THE STABILIZED CONSTRUCTION ENTRANCE PRIOR TO COMMENCEMENT OF GRADING. LOCATION OF THE ENTRANCE MAY BE ADJUSTED BY THE CONTRACTOR TO FACILITATE GRADING OPERATIONS. ALL CONSTRUCTION TRAFFIC ENTERING THE PAVED ROAD MUST CROSS THE STABILIZED CONSTRUCTION ENTRANCE. THE STABILIZED CONSTRUCTION ENTRANCE SHALL REMAIN IN PLACE UNTIL THE ROAD BASE ROCK COURSE IS COMPLETED.
9. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE SWEPT AT THE END OF EACH WORKING DAY OR AS NECESSARY.
10. CONTRACTOR SHALL PLACE INLET FILTER BAGS AROUND ALL NEW DRAINAGE STRUCTURE OPENINGS IMMEDIATELY AFTER THE STRUCTURE OPENING IS CONSTRUCTED. THESE INLET FILTER BAGS SHALL BE MAINTAINED AND REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED. STRAW BALES OR GRAVEL BAGS SHALL BE PLACED AROUND ALL EXISTING DRAINAGE INLETS IN THE VICINITY OF PROJECT SITE.
11. CONTRACTOR SHALL PLACE SILT FENCING OR FILTER ROLL ALONG THE PERIMETER OF PROJECT SITE.
12. GRADING SHALL NOT OCCUR WHEN WIND SPEEDS EXCEED 20 MPH OVER A ONE (1) HOUR PERIOD.
13. CONTRACTOR SHALL IMPLEMENT HOUSEKEEPING PRACTICES AS FOLLOWS:

A. SOLID WASTE MANAGEMENT:
PROVIDE DESIGNATED WASTE COLLECTION AREAS AND CONTAINERS. ARRANGE FOR REGULAR REMOVAL AND DISPOSAL. CLEAR SITE OF TRASH INCLUDING ORGANIC DEBRIS, PACKAGING MATERIALS, SCRAP OR SURPLUS BUILDING MATERIALS AND DOMESTIC WASTE DAILY.

B. MATERIAL DELIVERY AND STORAGE:
PROVIDE A DESIGNATED MATERIAL STORAGE AREA WITH SECONDARY CONTAINMENT SUCH AS BERMING. STORE MATERIAL ON PALLETS AND PROVIDE COVERING FOR SOLUBLE MATERIALS. RELOCATE STORAGE AREA INTO BUILDING SHELL WHEN POSSIBLE. INSPECT AREA WEEKLY.

C. CONCRETE WASTE:
PROVIDE A DESIGNATED AREA FOR A TEMPORARY PIT TO BE USED FOR CONCRETE TRUCK WASH-OUT. DISPOSE OF HARDENED CONCRETE OFFSITE. AT NO TIME SHALL A CONCRETE TRUCK DUMP ITS WASTE AND CLEAN ITS TRUCK INTO THE CITY STORM DRAINS VIA CURB AND GUTTER. INSPECT DAILY TO CONTROL RUNOFF, AND WEEKLY FOR REMOVAL OF HARDENED CONCRETE.

D. PAINT AND PAINTING SUPPLIES:
PROVIDE INSTRUCTION TO EMPLOYEES AND SUBCONTRACTORS REGARDING REDUCTION OF POLLUTANTS INCLUDING MATERIAL STORAGE, USE, AND CLEAN UP. INSPECT SITE WEEKLY FOR EVIDENCE OF IMPROPER DISPOSAL.

E. VEHICLE FUELING, MAINTENANCE AND CLEANING:
PROVIDE A DESIGNATED FUELING AREA WITH SECONDARY CONTAINMENT SUCH AS BERMING. DO NOT ALLOW MOBILE FUELING OF EQUIPMENT. PROVIDE EQUIPMENT WITH DRIP PANS. RESTRICT ONSITE MAINTENANCE AND CLEANING OF EQUIPMENT TO A MINIMUM. INSPECT AREA WEEKLY.

F. HAZARDOUS WASTE MANAGEMENT:
PREVENT THE DISCHARGE OF POLLUTANTS FROM HAZARDOUS WASTES TO THE DRAINAGE SYSTEM THROUGH PROPER MATERIAL USE, WASTE DISPOSAL AND TRAINING OF EMPLOYEES. HAZARDOUS WASTE PRODUCTS COMMONLY FOUND ON-SITE INCLUDE BUT ARE NOT LIMITED TO PAINTS & SOLVENTS, PETROLEUM PRODUCTS, FERTILIZERS, HERBICIDES & PESTICIDES, SOIL STABILIZATION PRODUCTS, ASPHALT PRODUCTS AND CONCRETE CURING PRODUCTS.

TOTAL DISTURBED AREA: 0.86 ACRES

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BY BRYAN P. BONINO DATE 04/11/2024 P.E. 41804

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
EROSION & SEDIMENTATION CONTROL PLAN
120 W. MAIN STREET
WOODLAND, CA

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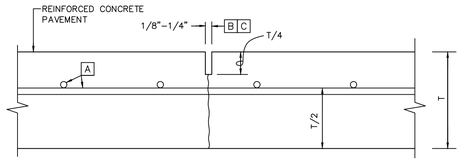


NOTES

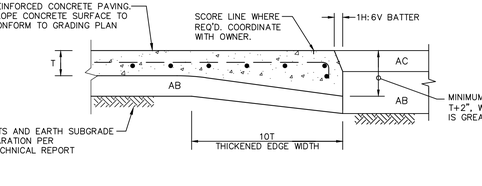
A DISTRIBUTED STEEL REINFORCEMENT PER PLAN.

B TOOLED GROOVE WITH 1/4" RADIUS OR SAW CUT.

C 12' MAX. JOINT SPACING IN EACH DIRECTION. PRIOR TO CONCRETE CONSTRUCTION THE CONTRACTOR SHALL SUBMIT FOR OWNER APPROVAL A COPY OF THE JOINTING PLAN, DETAILING THE TYPES AND LOCATIONS OF PROPOSED CONSTRUCTION, EXPANSION, CONTRACTION AND ISOLATION JOINTS.

D WHERE PAVING WILL BE SUBJECTED TO HARD WHEEL EQUIPMENT USE, IT IS RECOMMENDED TO FILL ALL JOINTS WITH AN EPOXY JOINT FILLER-COORDINATE WITH THE OWNER.

1 PCC PAVING CONTRACTION (CRACK CONTROL) JOINT
NTS



NOTES

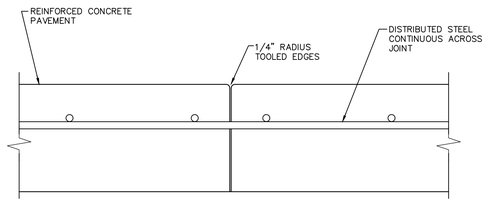
A DISTRIBUTED STEEL REINFORCEMENT PER PLAN.

B 0.75" MIN. DIAMETER FOR 5" ≤ T ≤ 6.5" AND 1" MINIMUM DIAMETER FOR T > 6.5", 16" MINIMUM LENGTH, EPOXY-COATED, SMOOTH (FREE OF BURRS AND DEFORMATIONS), ROUND STEEL BAR (ASTM A615) DOWELS AT 12" MAX. SPACING, PROPERLY SUPPORTED AT MID-SLAB DEPTH TO PREVENT DISLOCATION BY CONCRETE PLACEMENT OPERATIONS. AT LEAST HALF OF EACH DOWEL SHALL BE COATED WITH A BOND BREAKING SUBSTANCE (5 MIL MAX. THICKNESS). PLASTIC DOWEL SLEEVES MAY BE USED INSTEAD OF A COATING. DOWELS SHALL BE SECURELY AND ACCURATELY ALIGNED PARALLEL TO THE SLAB SURFACE AND TO THE CENTERLINE OF THE SLAB. MAX. TOLERANCE IS 1/4" PER DOWEL LENGTH IN THE HORIZONTAL, VERTICAL OR COMBINED ALIGNMENT.

C WHEN JOINING EXISTING CONCRETE, DRILL AND BOND DOWEL INTO EXISTING CONCRETE WITH GROUT. THE DRILLED HOLE SHALL BE 1/8" TO 3/16" LARGER THAN THE DOWEL DIAMETER. ROUNDING THE CORNER OF THE EXISTING CONCRETE EDGE IS NOT REQUIRED.

D PRIOR TO CONCRETE CONSTRUCTION THE CONTRACTOR SHALL SUBMIT FOR OWNER APPROVAL A COPY OF THE JOINTING PLAN, DETAILING THE TYPES AND LOCATIONS OF PROPOSED CONSTRUCTION, CONTRACTION AND ISOLATION JOINTS.

2 PCC PAVING CONSTRUCTION JOINT
NTS

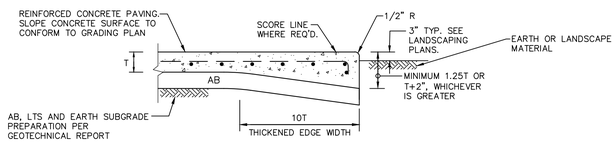


3 PCC PAVING CONSTRUCTION COLD JOINT
NTS

NOTE

PCC PAVEMENTS SHALL HAVE THICKENED EDGES AT ALL FREE PAVEMENT EDGES. A FREE PAVEMENT EDGE IS DEFINED AS ANY PCC PAVEMENT JOINT OR EDGE WHERE LOAD TRANSFER TO ADJACENT AREAS IS NOT PROVIDED, SUCH AS ADJACENT TO LANDSCAPING, AT DRIVE-THROUGH DOORWAYS, OR AT TRANSITIONS BETWEEN PCC AND AC PAVING.

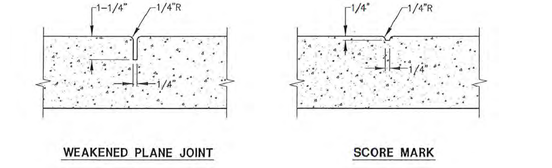
4 PCC PAVING THICKENED EDGE ADJOINING AC PAVING
NTS



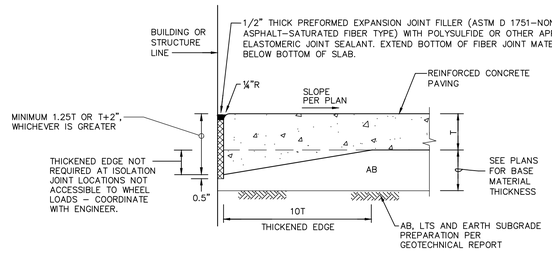
NOTE

PCC PAVEMENTS SHALL HAVE THICKENED EDGES AT ALL FREE PAVEMENT EDGES. A FREE PAVEMENT EDGE IS DEFINED AS ANY PCC PAVEMENT JOINT OR EDGE WHERE LOAD TRANSFER TO ADJACENT AREAS IS NOT PROVIDED, SUCH AS ADJACENT TO LANDSCAPING, AT DRIVE-THROUGH DOORWAYS, OR AT TRANSITIONS BETWEEN PCC AND AC PAVING.

5 PCC PAVING THICKENED EDGE ADJOINING LANDSCAPING
NTS



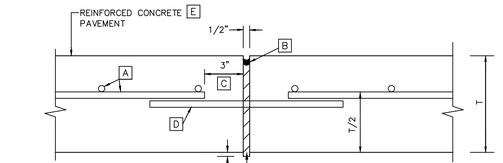
6 CONCRETE WALK JOINT DETAILS
NTS



NOTES

1. PLACE ISOLATION JOINTS AT BUILDINGS, UTILITY STRUCTURES AND OTHER MISCELLANEOUS STRUCTURES.
2. FOR JOINTS AROUND COLUMNS, POSTS, ETC. USE TYPICAL DIAMOND-SHAPED JOINT CONFIGURATION AND COORDINATE WITH CONTRACTOR-PREPARED AND OWNER-APPROVED PAVEMENT JOINTING PLAN.

7 PCC PAVING ISOLATION JOINT
NTS



NOTES

A DISTRIBUTED STEEL REINFORCEMENT PER PLAN.

B INSTALL JOINT SEALANT PER MANUFACTURER'S RECOMMENDATIONS FOR THE JOINT WIDTH AND SEALANT INSTALLATION. SEALANT SHALL BE COLD-POUR, SINGLE COMPONENT, SELF-LEVELING SILICONE OR POLYSULFIDE, WITH COLOR TO MATCH PAVEMENT. COORDINATE WITH OWNER.

C DISCONTINUE DISTRIBUTED STEEL REINFORCEMENT AT EXPANSION JOINTS.

D 0.75" MIN. DIAMETER FOR 5" ≤ T ≤ 6.5" AND 1" MINIMUM DIAMETER FOR T > 6.5", 16" MINIMUM LENGTH, EPOXY-COATED, SMOOTH (FREE OF BURRS AND DEFORMATIONS), ROUND STEEL BAR (ASTM A615) DOWELS AT 12" MAX. SPACING, PROPERLY SUPPORTED AT MID-SLAB DEPTH TO PREVENT DISLOCATION BY CONCRETE PLACEMENT OPERATIONS. AT LEAST HALF OF EACH DOWEL SHALL BE COATED WITH A BOND BREAKING SUBSTANCE (5 MIL MAX. THICKNESS). PLASTIC DOWEL SLEEVES MAY BE USED INSTEAD OF A COATING. DOWELS SHALL BE SECURELY AND ACCURATELY ALIGNED PARALLEL TO THE SLAB SURFACE AND TO THE CENTERLINE OF THE SLAB. MAX. TOLERANCE IS 1/4" PER DOWEL LENGTH IN THE HORIZONTAL, VERTICAL OR COMBINED ALIGNMENT.

E 60' MAX. JOINT SPACING IN EACH DIRECTION. INSTALL JOINTS AT POINTS OF TANGENCY, AT ENDS OF DRIVEWAYS, ETC. PRIOR TO CONCRETE CONSTRUCTION THE CONTRACTOR SHALL SUBMIT FOR OWNER APPROVAL A COPY OF THE JOINTING PLAN, DETAILING THE TYPES AND LOCATIONS OF PROPOSED EXPANSION, CONSTRUCTION, CONTRACTION AND ISOLATION JOINTS, AND JOINT SEALANT.

F 1/2" THICK PREFORMED EXPANSION JOINT FILLER (ASTM D 1751-NONEXTRUDING, ASPHALT-SATURATED FIBER TYPE) WITH APPROVED JOINT SEALANT.

8 PCC PAVING EXPANSION JOINT
NTS

LM LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING
608 COURT STREET, WOODLAND, CALIFORNIA 95695 - PHONE: (530) 662-1755
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 - FAX: (530) 662-4602
BY BRYAN P. BONINO DATE 04/11/2024 P.E. 41804
REGISTERED PROFESSIONAL ENGINEER BRYAN P. BONINO No. 41804 CIVIL STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
DETAILS
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
1		
2		
3		
4		
5		
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DATE 01.08.24
DRAWN -
JOB NO. 464-81
SHEET C701
11 OF 13

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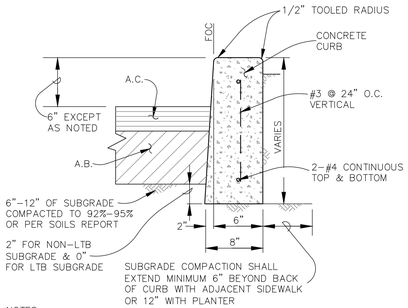
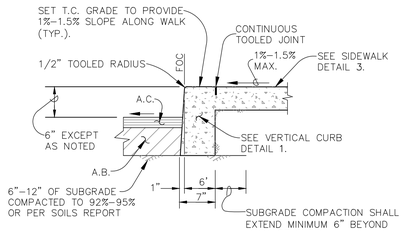


NOTES:

1. INSTALL 1/2" PRE-MOLDED EXPANSION JOINT AT 60' O.C. MAXIMUM AND AT EACH END OF RADIUS SECTIONS.
2. CONTRACTOR SHALL VERIFY WITH ENGINEER AND ARCHITECT PLAN INTENT FOR CURB HEIGHT DEPRESSIONS FOR RAMPS, TRANSITIONS, ETC. PRIOR TO CONSTRUCTION.
3. INSTALL 1/4" EXPANSION JOINTS @ ALL E.C., B.C., ANGLE POINTS AND COLD JOINTS. INSTALL DEEP TOOLED JOINTS @ 10' O.C. MAXIMUM.

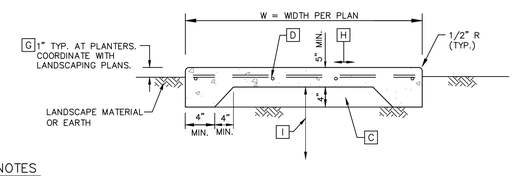
1 6" VERTICAL CURB
NTS



NOTES:

1. INSTALL 1/2" PRE-MOLDED EXPANSION JOINT WITH DOWELS @ 60' ON CENTER MAXIMUM AND AT EACH END OF RADIUS SECTION.
2. CONTRACTOR SHALL VERIFY WITH ENGINEER AND ARCHITECT PLAN INTENT FOR CURB HEIGHT DEPRESSIONS FOR ADA RAMPS, TRANSITIONS, ETC. PRIOR TO CONSTRUCTION.
3. INSTALL 1/2" EXPANSION JOINTS @ ALL E.C., B.C., ANGLE POINTS AND COLD JOINTS. INSTALL DEEP TOOLED CONTROL JOINTS AT 10' ON CENTER MAXIMUM.

2 MONOLITHIC CURB AND SIDEWALK
NTS



NOTES

A ALL WORK AND MATERIALS SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT. CONCRETE SHALL BE CLASS "B-2", 5-SACK MIX WITH 3" MAX. SLUMP, AND UNLESS NOTED OTHERWISE IN THESE PLANS.

B SEE DETAIL 2, SHEET C702 FOR WEAKENED PLANE (CRACK CONTROL), EXPANSION AND CONTACT JOINTS AND SCORE LINES. MAXIMUM EXPANSION JOINT SPACING IS 60'. FOR W=4' SPACE WEAKENED PLANE JOINTS AT 12', WITH SCORE LINES IN BETWEEN AT 4' SPACING. FOR W=5' OR 6' WEAKENED PLANE JOINTS AT 10', WITH SCORE LINES IN BETWEEN AT 5' SPACING. CONTRACTOR TO PREPARE AND SUBMIT JOINTING PLAN FOR OWNER APPROVAL.

C 4" MIN. THICKNESS OF 3/4" CL. 2 AB AT 95% MRC.

D IF WIDTH IS GREATER THAN 5', PCC WALK SHALL BE REINFORCED WITH #3 BARS EACH WAY, AT 24" MAX. SPACING, CENTERED IN SLAB, AND SECURELY SUPPORTED ON PRECAST CONC. BLOCKS (DOBIES).

E APPLY MEDIUM BROOM FINISH TRANSVERSE TO DIRECTION OF TRAVEL.

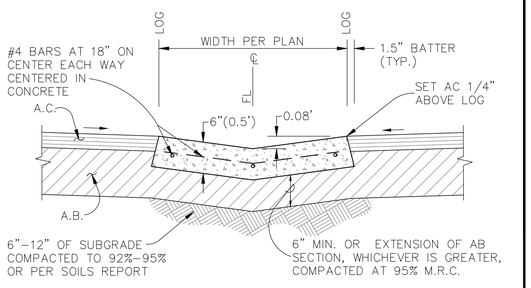
F ALL EXPOSED EDGES SHALL HAVE 1/2" RADIUS.

G COORDINATE WITH PROJECT LANDSCAPE PLANS.

H SEE PLANS FOR WALK SURFACE SLOPE. 1% MIN. AND 2% MAX. UNIFORM SLOPES, UNLESS NOTED OTHERWISE.

I AB AND SUBGRADE PREPARATION PER GEOTECHNICAL ENGINEERING REPORT. COMPACTED SUBGRADE TO EXTEND 1' (MIN.) BEYOND EDGE OF WALK.

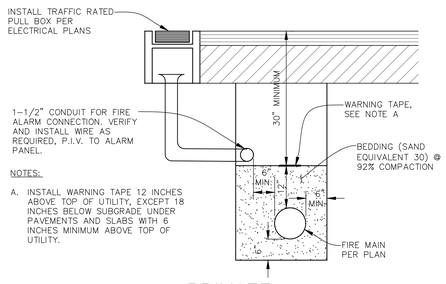
3 TYPICAL PCC WALK
NTS



NOTES:

1. INSTALL 1/2" PRE-MOLDED EXPANSION JOINT WITH DOWELS @ 60' ON CENTER MAXIMUM, COLD JOINTS AND AT EACH END OF RADIUS SECTION.
2. INSTALL 1/2" EXPANSION JOINTS @ ALL E.C., B.C., ANGLE POINTS AND COLD JOINTS. INSTALL DEEP TOOLED CONTROL JOINTS AT 10' ON CENTER MAXIMUM.
3. ALL EXPOSED EDGES SHALL HAVE 1/2" RADIUS.
4. APPLY MEDIUM BROOM FINISH TO SURFACE OF GUTTER PARALLEL WITH FLOWLINE.

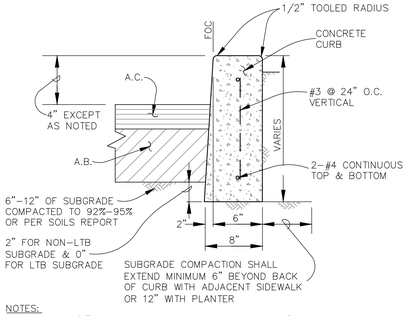
4 CONCRETE VALLEY GUTTER
NTS



NOTES:

A. INSTALL WARNING TAPE 12 INCHES ABOVE TOP OF UTILITY, EXCEPT 18 INCHES BELOW SUBGRADE UNDER PAVEMENTS AND SLABS WITH 6 INCHES MINIMUM ABOVE TOP OF UTILITY.

5 PRIVATE FIRE SERVICE TRENCH
NTS



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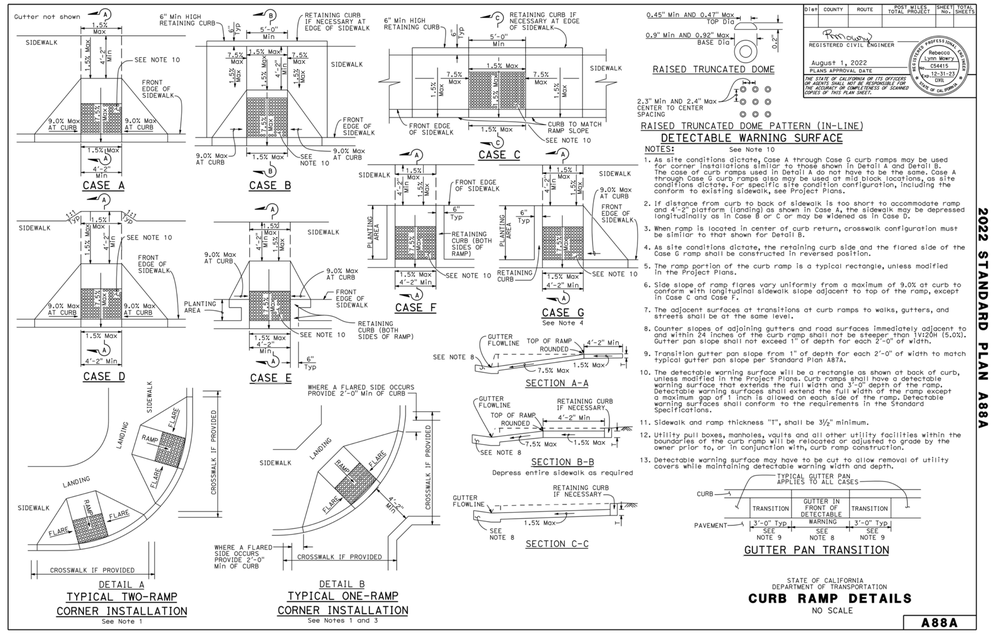
3. INSTALL 1/4" EXPANSION JOINTS @ ALL E.C., B.C., ANGLE POINTS AND COLD JOINTS. INSTALL DEEP TOOLED JOINTS @ 10' O.C. MAXIMUM.

6 4" VERTICAL CURB
NTS

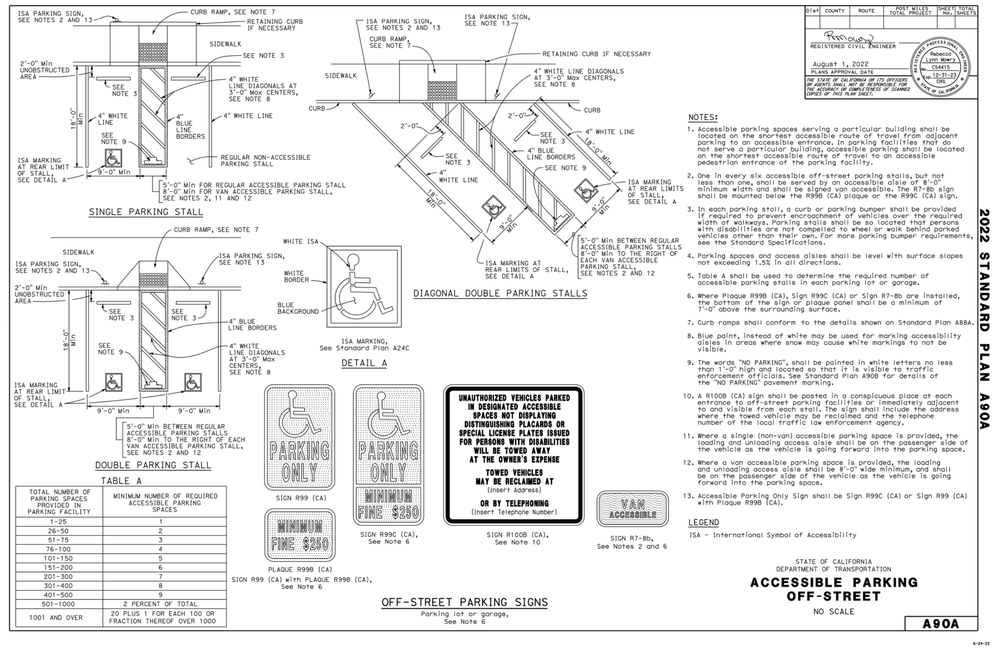
157



NOTES:
1. ADA RAMPS AND ACCESSIBLE STALLS CONFORM TO THESE PLANS AND 2019 CBC11B.

CALTRANS STANDARD PLAN A88A
NTS

159



NOTES:
1. ADA RAMPS AND ACCESSIBLE STALLS CONFORM TO THESE PLANS AND 2019 CBC11B.

CALTRANS STANDARD PLAN A90A
NTS

2022 STANDARD PLAN A88A

2022 STANDARD PLAN A90A

DIST	COUNTY	ROUTE	POST MILES / TOTAL PROJECT	SHEET TOTAL / No. SHEETS

REGISTERED CIVIL ENGINEER
August 1, 2022
PLANS APPROVAL DATE
Rebecca Lynn Moretz, No. C56415, 12-31-23, CIVIL, STATE OF CALIFORNIA
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

LM LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING
608 COURT STREET, WOODLAND, CALIFORNIA 95695 · PHONE: (530) 662-1755
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 · FAX: (530) 662-4602
BY BRYAN P. BONINO
DATE 04/11/2024 P.E. 41804

REGISTERED PROFESSIONAL ENGINEER · BRYAN P. BONINO · No. 41804 · CIVIL · STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
DETAILS
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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DATE 01.08.24
DRAWN -
JOB NO. 464-81
SHEET C702
12 OF 13

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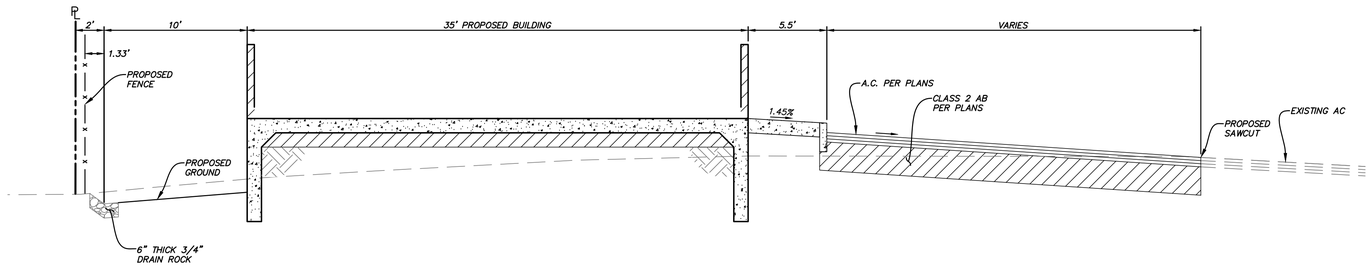
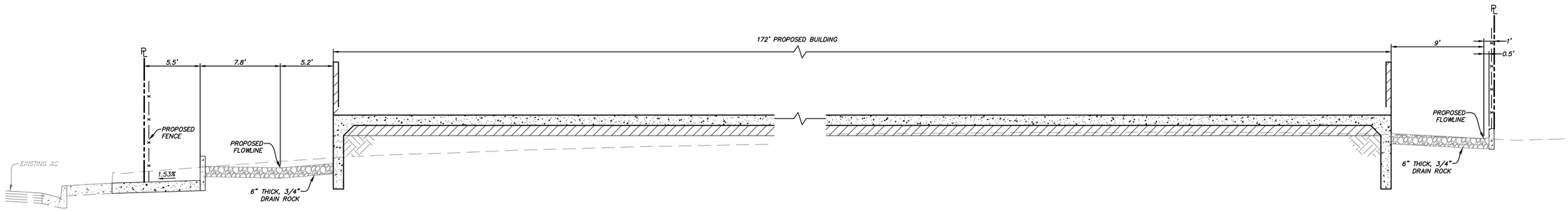
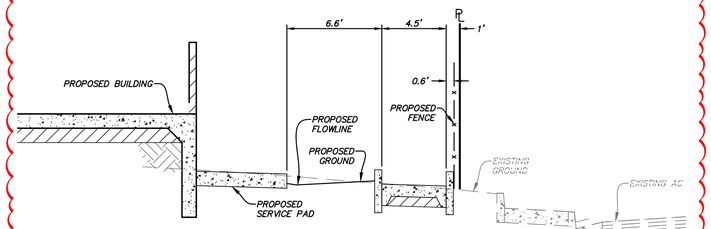


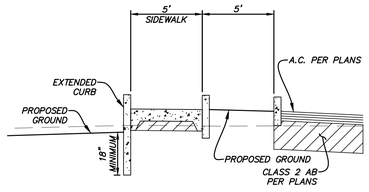
A PROPOSED SHOP & IMPROVEMENTS
NTS



B PROPOSED SHOP & IMPROVEMENTS
NTS



PROPOSED SHOP AT NORTH PROPERTY LINE
C NTS



PROPOSED NORTH SIDEWALK RAMP ADJACENT TO EV PARKING STALLS
D NTS

LM LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING
608 COURT STREET, WOODLAND, CALIFORNIA 95695 · PHONE: (530) 662-1755
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 · FAX: (530) 662-4602

REGISTERED PROFESSIONAL ENGINEER · BRYAN P. BONINO · No. 41804 · CIVIL · STATE OF CALIFORNIA

BY BRYAN P. BONINO
DATE 04/11/2024 P.E. 41804

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
CROSS SECTIONS
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
3	07-29-2024	ALL ELECTRIC

DATE	01.08.24
DRAWN	-
JOB NO.	464-81
SHEET	C801
	13 OF 13

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PRESCRIPTIVE COMPLIANCE WATER EFFICIENT LANDSCAPE PROJECT INFORMATION

PROJECT NAME: YOLO COUNTY AG DEPT. SHOPS BUILDING
PROJECT LOCATION: 120 WEST MAIN STREET
TOTAL LANDSCAPE AREA: 1390 SQUARE FEET
PROJECT TYPE: INSTITUTIONAL
WATER SUPPLY: POTABLE

INCLUDED IN THIS PROJECT SUBMITTAL PACKAGE ARE:

- X 1.PROJECT INFORMATION (THIS SHEET)
- ~~2. WATER EFFICIENT LANDSCAPE WORKSHEET (THIS SHEET)~~
- ~~3. SOIL MANAGEMENT REPORT (SHEET ____ & OTHER)~~
- X 4.LANDSCAPE DESIGN PLAN (SHEET L2)
- X 5.IRRIGATION DESIGN PLAN (SHEET L1)
- X 6.GRADING DESIGN PLAN (SEE CIVIL GRADING PLANS)

OWNER:

APPLICANT: GARTH RUFFNER (CA. LANDSCAPE ARCHITECT #2808)
GARTH RUFFNER LANDSCAPE ARCHITECT
4120 DOUGLAS BLVD. #306-301
ROSEVILLE, CA 95746
(916) 797-2576

I AGREE TO COMPLY WITH THE REQUIREMENTS OF THE WATER EFFICIENT LANDSCAPE ORDINANCE AND SUBMIT A COMPLETE LANDSCAPE DOCUMENTATION PACKAGE. I HAVE COMPLIED WITH THE CRITERIA OF THE ORDINANCE AND APPLIED THEM ACCORDINGLY FOR THE EFFICIENT USE OF WATER IN THE IRRIGATION DESIGN PLAN.

SIGNATURE 12/12/23 DATE

IRRIGATION LEGEND

SYMBOL	DESCRIPTION:	MANUFACTURER & MODEL NUMBER	RADIUS	GALLONS PER MINUTE	"/HR.	DETAIL
	PRESSURE COMP. DRIPLINE (SUBSURFACE)	RAINBIRD XFS-CV-09-18	0'	1.02 GPM/ 100'	.7	F & G, SHT. L3
	PRESSURE COMP. DRIPLINE (ON-GRADE)	RAINBIRD XF-CV-09-18	0'	1.02 GPM/ 100'	.7	F & G, SHT. L3
	DRIP FLEX RISERS (QTY. PER PLAN) LOCATE RISERS PER DETAIL	PARKER MANUFACTURING 1/2" COBRA CONNECTOR #CCO (LENGTH AS REQUIRED)				G, SHT. L3
	MANUAL FLUSH VALVE	SEE DETAIL (1/2" SIZE)				H, SHT. L4
	QUICK COUPLING VALVE	RAINBIRD #33DRC				E, SHT. L3
	R.C. VALVE, FILTER & REGULATOR	RAINBIRD XCZ-075-PRF CONTROL ZONE KIT				D, SHT. L3
M	1" PRIVATE SUBMETER	ZENNER PMN01 (5/8"x1/2") OR APPROVED EQUAL (INSTALL IN BOX PER MFR.'S DETAILS & SPEC.'S)				
	BRONZE GATE VALVE	NIBCO #T-113 (1" SIZE)				C, SHT. L3
	REDUCED PRESSURE BACKFLOW DEVICE	WILKINS 975XL2 (3/4" SIZE) IN PLACER WATERWORKS E-1A ENCLOSURE				B, SHT. L3
C	IRRIGATION CONTROLLER	IRRITROL SYSTEMS MC-4E				A, SHT. L3
W	WEATHER SENSOR	IRRITROL CL-100-WIRELESS (INSTALL PER MFR.'S SPEC.'S AT LOCATION APPROVED BY OWNER)				
	CLASS 200 PVC LATERAL LINE (3/4" SIZE)					
	EXISTING P.V.C. LATERAL (FIELD VERIFY LOCATION & CONDITION)					
	SCHEDULE 40 PVC MAINLINE (1" SIZE)					
	SCHEDULE 40 PVC MAINLINE SLEEVE (SIZE AND QUANTITY AS REQUIRED) LATERAL SLEEVES ARE NOT SHOWN					
1" 3 C 1	VALVE SIZE CONTROLLER AND STATION NUMBER GALLONS PER MINUTE					

IRRIGATION SCHEDULE

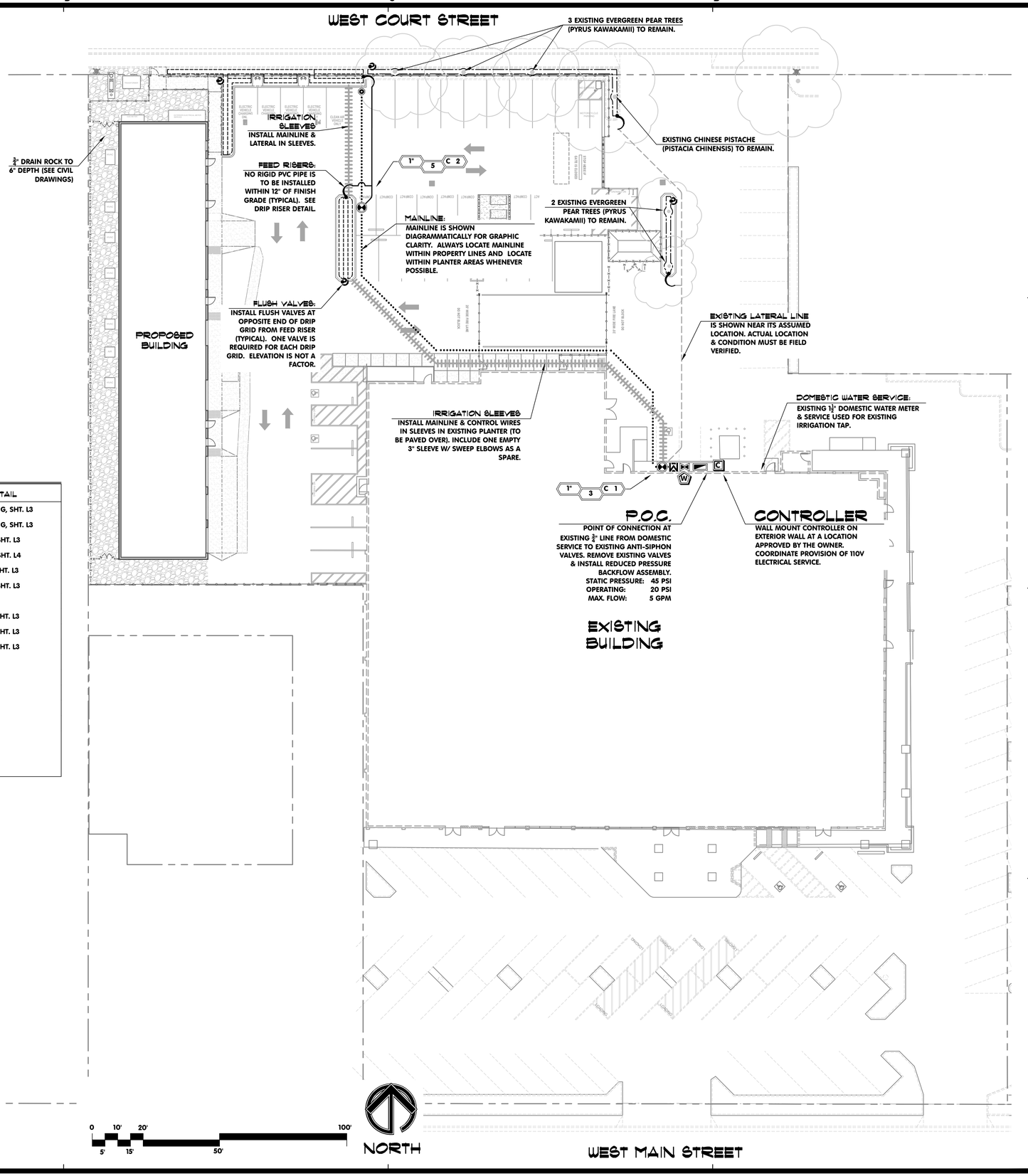
STATION	DAYS/ WEEK	STARTS/ DAY	MINUTES/ START
C1	2	3	22
C2	2	3	9

WATER BUDGET

MATURE PLANTING			
MONTH	PERCENT	MONTH	PERCENT
JULY	100%	JANUARY	12%
AUGUST	88%	FEBRUARY	22%
SEPTEMBER	66%	MARCH	39%
OCTOBER	45%	APRIL	57%
NOVEMBER	21%	MAY	74%
DECEMBER	12%	JUNE	94%
ESTABLISHMENT PERIOD			
MONTH	PERCENT	MONTH	PERCENT
JULY	150%	JANUARY	18%
AUGUST	132%	FEBRUARY	33%
SEPTEMBER	99%	MARCH	59%
OCTOBER	68%	APRIL	86%
NOVEMBER	31%	MAY	112%
DECEMBER	18%	JUNE	141%

IRRIGATION NOTES

1. SEE DETAILS & SPECIFICATIONS FOR MATERIALS & PROCEDURES.
2. THE SYSTEM IS DESIGNED TO OPERATE AT A MINIMUM STATIC PRESSURE OF 40 PSI AND A MAXIMUM FLOW OF 5 GPM. VERIFY PRESSURE AND FLOW RATE PRIOR TO BEGINNING ANY IRRIGATION WORK AND IMMEDIATELY NOTIFY THE LANDSCAPE ARCHITECT OF THE RESULTS.
3. MAINLINE IS SHOWN DIAGRAMMATICALLY AND SHALL BE PLACED IN PLANTER AREAS WHENEVER POSSIBLE.
4. IRRIGATION VALVES SHALL NEVER BE PLACED IN PAVED AREAS OR OUTSIDE PROPERTY LINES. LOCATE ALL VALVES IN CLOSE PROXIMITY TO THE LOCATION SHOWN ON THE PLAN IN A PLANTED AREA.
5. RUN EXTRA CONTROL WIRE (YELLOW) FROM CONTROLLER TO VALVE BOX C2 & COIL 2' IN THE BOX.
6. DRIPLINE SHALL BE PLACED IN A CONTINUOUS LOOP AROUND THE ENTIRE PERIMETER OF THE IRRIGATED AREA, 5-7" FROM PAVEMENT. THE INTERNAL DRIPLINE TUBING GRID SHALL BE INSTALLED AT 21 INCHES ON CENTER IN ACCORD WITH THE QUANTITY SHOWN ON THE PLAN, WITH EVERY TUBE CONNECTED TO THE PERIMETER LOOP AT BOTH ENDS.
7. PVC LATERALS AND FLEX RISERS FOR DRIP IRRIGATION ARE SHOWN DIAGRAMMATICALLY AND SHOULD ALWAYS BE LOCATED IN A PLANTER AREA WHENEVER POSSIBLE.
8. PROVIDE WATER EFFICIENT LANDSCAPE ORDINANCE COMPLETION SERVICES IN ACCORD WITH APPLICABLE AGENCY REQUIREMENTS & SPECIFICATION SECTION 32 8400.



Garth Ruffner Landscape Architect (916) 797-2576
4120 Douglas Blvd., Suite 306, #301, Roseville, CA 95746-9595
GarthRuffner.com California PLA #2808

IRRIGATION PLAN

LICENSED LANDSCAPE ARCHITECT GARTH RUFFNER LA #2808 12/12/23 SIGNATURE 5/31/24 RENEWAL STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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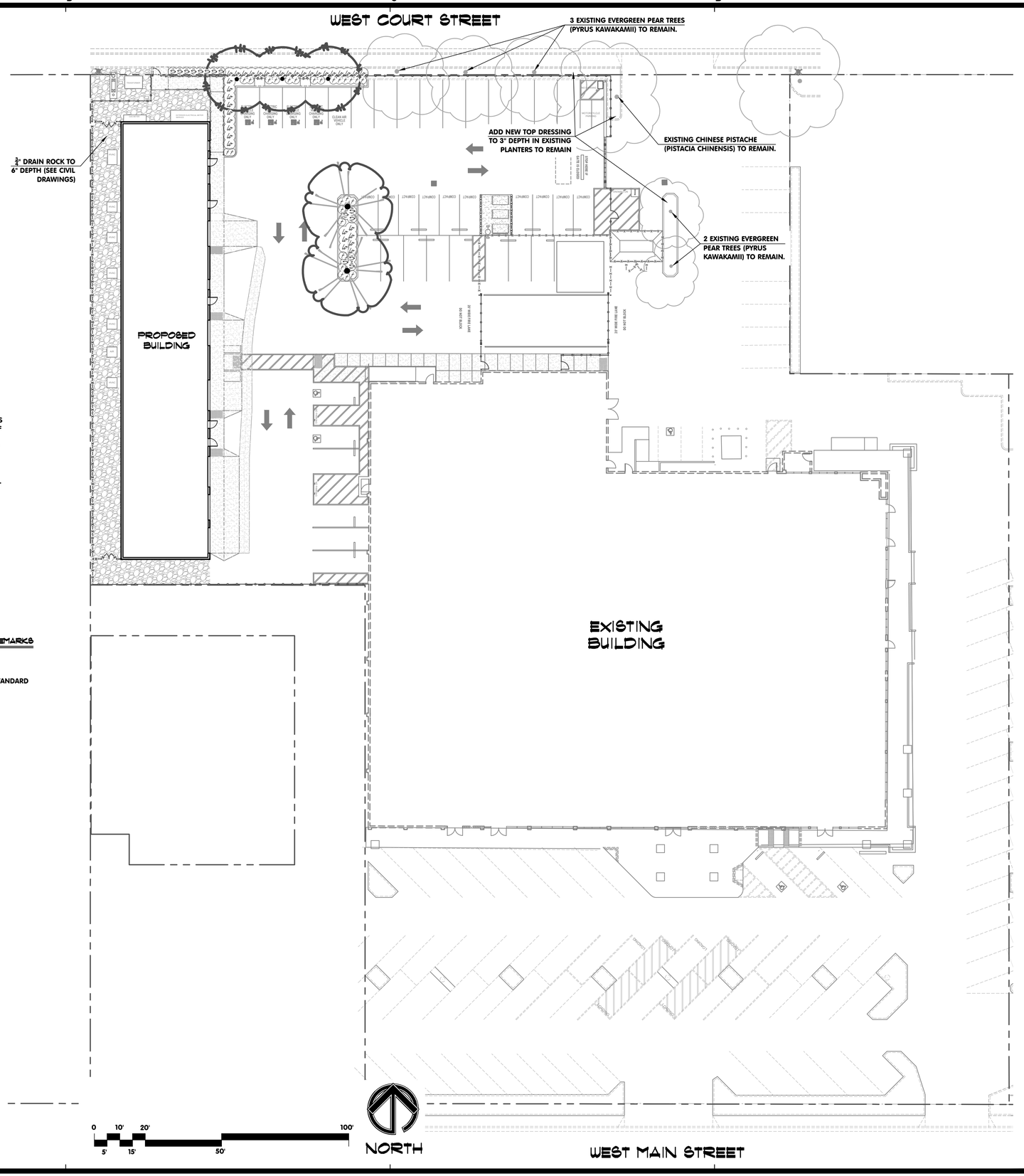
DATE	12.12.23
DRAWN	GR
JOB NO.	21027 (43062)
SHEET	L1
OF	5 SHEETS



PLANTING NOTES

1. SEE DETAILS AND SPECIFICATIONS FOR MATERIALS AND PROCEDURES. NOTE DATES FOR SUBMITTALS AND REQUIREMENTS REGARDING PLANT ORDERS.
2. FIELD SHRUB LAYOUTS SHALL CONFORM PRECISELY TO THE LAYOUT SHOWN ON THE PLANS UNLESS FIELD CHANGES FORCE VARIATIONS. NOTE THAT THE SPACING SHOWN BETWEEN SHRUBS OF LIKE SPECIES IS CONSTANT. CONFORM TO PLAN SPACINGS SHOWN BETWEEN SHRUBS OF DIFFERENT SPECIES AS WELL AS BETWEEN SHRUBS AND PLANTER EDGES. THE LANDSCAPE ARCHITECT MAY REQUIRE REPLANTING, AT THE CONTRACTOR'S EXPENSE, OF ALL SHRUBS AND TREES NOT LOCATED IN CONFORMANCE TO THE PLAN.
3. THE QUANTITIES SHOWN ON THE PLANT LIST SUPERCEDE PLANT COUNTS TAKEN FROM THE DRAWINGS UNLESS MORE PLANTS ARE INDICATED ON THE DRAWINGS. IF ALL PLANT LOCATIONS CANNOT BE DETERMINED, CONTACT THE LANDSCAPE ARCHITECT (AFTER AWARD OF THE CONTRACT) FOR ADDITIONAL INFORMATION.
4. PROTECT EXISTING PLANT MATERIALS NOTED AS "TO REMAIN". DO NOT SEVER ROOTS IN EXCESS OF 2 INCHES IN DIAMETER. NOTIFY THE OWNER'S REPRESENTATIVE OF EXISTING PLANTS WHICH ARE NOT SHOWN ON THE PLANS AND REMOVE THE PLANTS IF INSTRUCTED TO DO SO.
5. REMOVE ALL BASE ROCK, COMPACTED SOILS AND/OR CONTAMINATED SOILS FROM PLANTING AREAS TO A DEPTH OF 24 INCHES. CONTAMINATION INCLUDES, BUT IS NOT LIMITED TO, LIME TREATMENT AND SOIL STERILANTS. BACKFILL PLANTERS WITH APPROVED TOPSOIL.
6. APPLY "MEDIUM FIR BARK" TOP DRESSING (SEE SPEC.'S) TO ALL PROPOSED & EXISTING (NORTH OF THE BUILDING ONLY) PLANTING AREAS TO A DEPTH OF 3 INCHES.

PLANT LIST & LEGEND

SYMBOL		BOTANIC NAME/COMMON NAME	SIZE	QUANTITY	REMARKS
		OLEA EUROPEA 'MAJESTIC BEAUTY/FRUITLESS OLIVE	15 GALLON	3	STANDARD
		PISTACIA CHINENSIS/CHINESE PISTACHE	15 GALLON	2	
DNL		DIANELLA REVOLUTA 'ALLYN-CITATION'/COOLVISTA FLAX LILY	1 GALLON	14	
LMB		LOMANDRA LONGIFOLIA 'LOMLON'/LIME TUFF MAT RUSH	1 GALLON	35	
TCC		TEUCRIUM CHAMAEDRYS/DWARF GERMANDER	1 GALLON	26	

Garth Ruffner Landscape Architect (916) 797-2576
4120 Douglas Blvd., Suite 306, #251, Roseville, CA 95746-6936
GarthRuffner.com California R.L.A. #2808

PLANTING PLAN

LICENSED LANDSCAPE ARCHITECT
GARTH RUFFNER LA #2808
12/12/23
SIGNATURE
5/31/24
RENEWAL
STATE OF CALIFORNIA

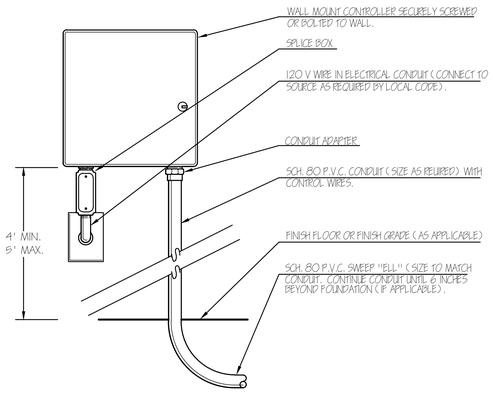
JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

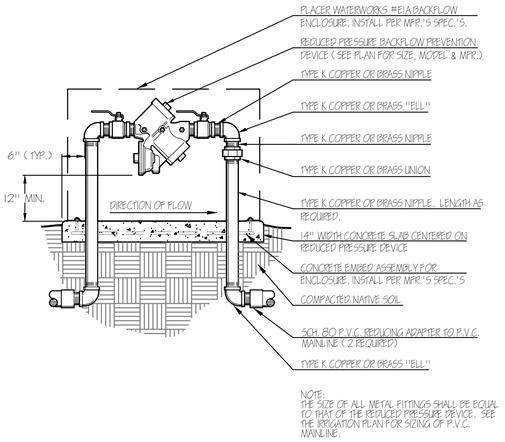
REVISIONS:

	DATE:	DESCRIPTION:
1		
2		
3		
4		
5		
6		

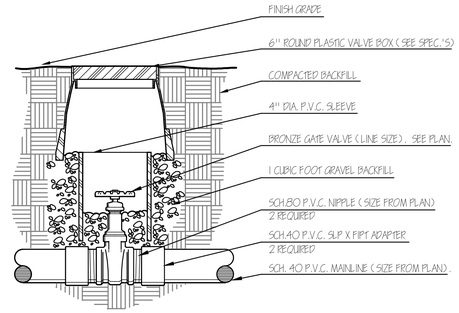
DATE 12.12.23
DRAWN GR
JOB NO. 21027 (43062)
SHEET L2
OF 5 SHEETS



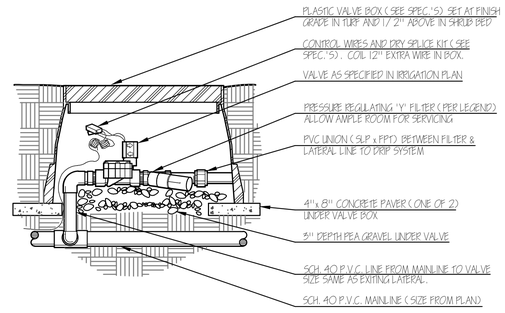
WALL MOUNTED CONTROLLER
DETAIL A



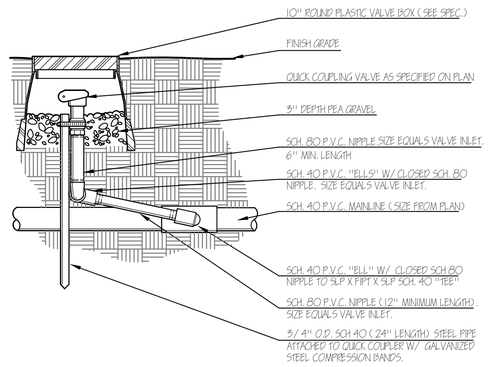
R. P. BACKFLOW DEVICE
DETAIL B



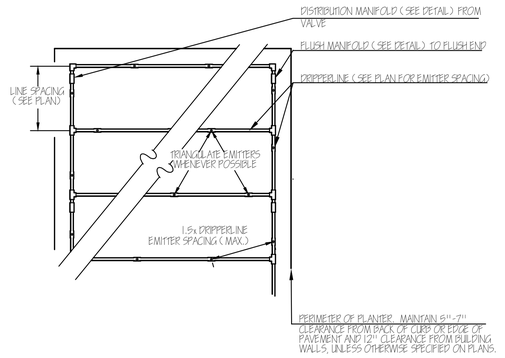
GATE VALVE
DETAIL C



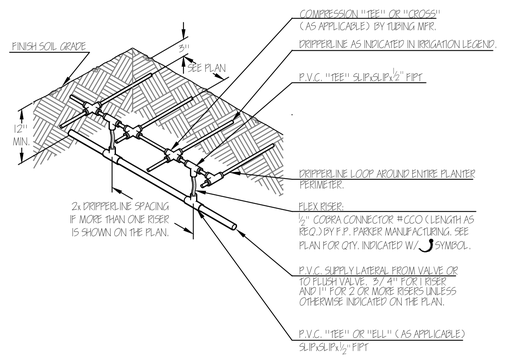
R.C. VALVE W/ PRESSURE REGULATING FILTER
DETAIL D



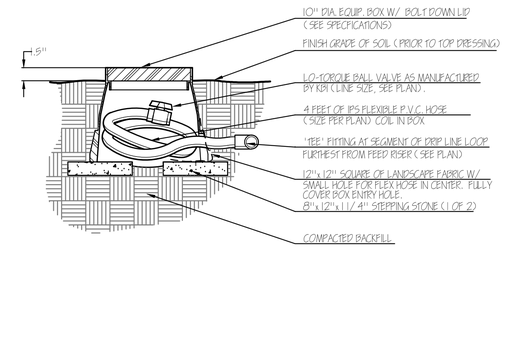
QUICK COUPLING VALVE IN BOX
DETAIL E



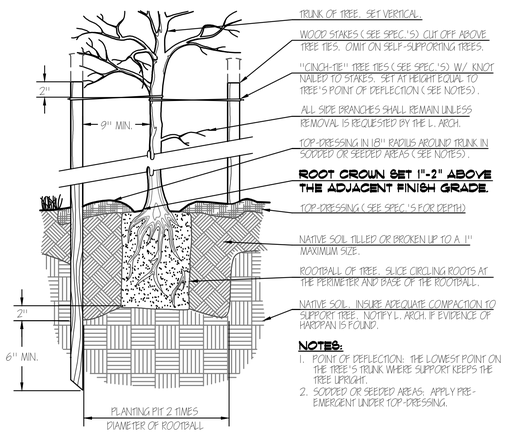
DRIP GRID EMITTER PATTERN
DETAIL F



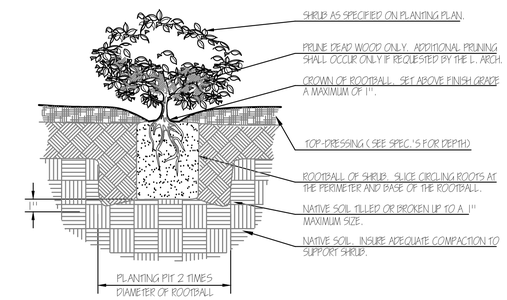
DRIP GRID RISER ISOMETRIC
DETAIL G



LINE END FLUSH VALVE
DETAIL H



TREE PLANTING
DETAIL K



SHRUB PLANTING
DETAIL L

Garth Ruffner Landscape Architect (916) 797-2576
4120 Douglas Blvd., Suite 306, #251, Roseville, CA 95746-8536
GarthRuffner.com California R.L.A. #2808

LANDSCAPE DETAILS

LICENSED LANDSCAPE ARCHITECT
GARTH RUFFNER LA #2808
12/12/23
SIGNATURE
5/31/24
RENEWAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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△		
△		

DATE	12.12.23
DRAWN	GR
JOB NO.	21027 (43062)
SHEET	L3
OF	5 SHEETS

SECTION 32 84 00 - PLANTING IRRIGATION

PART 1 - GENERAL

Drawings and general provisions of Contract, including General and Supplementary Conditions and Section 1 Specifications, apply to work of section.

1.1 SUMMARY

A. Includes but is not limited to:
1. General landscape requirements
2. Furnishing and installing the landscape irrigation system.

B. Related Sections:
1. Section 32 91 00 - Planting Preparation
2. Section 32 93 00 - Plants
3. Section 32 93 50 - Maintenance of Landscaping

1.2 DEFINITIONS

A. Owner's Representative: the person appointed by the Owner to monitor the work performed under this Section.

B. Significant Deviations:
1. Substitutions or omissions of products or procedures specified in the Contract Documents.
2. Relocations of system components (other than minor changes in pipe or valve locations to accommodate field conditions).
3. Increases in the spacing of drip emitters.

1.3 SUBMITTALS

A. Requests for significant deviations from the Contract Documents shall be made to the Owner's Representative in writing accompanied by applicable product information. Written permission from the Landscape Architect is required for any significant deviations.

B. Samples:
1. Submit samples to the Owner's Representative upon request and as indicated by Division 1 Specifications Sections.
2. Do not deliver submitted materials prior to approval of samples.

C. Supply the following to the Owner:
1. Tools
a. Two keys for the automatic controller.
b. Two quick coupler keys with attached hose swivels.
c. One dozen of each type of dripline fittings: 'tees,' elbows and couplings.
d. Forty linear feet of dripline tubing, coiled and bound.
2. As-Built Irrigation Plans on transparency paper.
3. One 3-ring binder including one set each of the following:
a. Operating instructions and parts lists, as printed by each manufacturer of each type of equipment installed.
b. A list of equipment with names and addresses of local manufacturer's representatives.
c. The written guarantee form, which follows this Section, completed and signed.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials shall be in full accordance with the latest rules and regulations and other applicable state or local laws. Nothing in the Contract Documents is to be construed to permit non-conformance to these codes.

1.5 JOB CONDITIONS

A. Documents:
1. Bring discrepancies, omissions or conflicts in the Contract Documents, or doubt as to the meaning thereof, to the attention of the Landscape Architect immediately.
2. In the event of conflicts between the drawings and specifications, the drawings shall govern.
3. Written dimensions supersede all dimensions scaled from plans.
4. Utility locations shown on the plans are approximate.

B. Field Conditions:
1. Thoroughly examine all existing conditions prior to bidding.
2. Install work in such a manner that it will conform to field conditions.

C. Arrange for all permits, licenses and inspections necessary for the installation.

D. Coordinate work with other trades. Immediately notify the Owner's Representative, in writing, of any conflicts.

E. Utilities:
1. Protect all existing utilities within the construction area and repair any damage that might occur to the satisfaction of the Governing Agency.
2. Notify U.S.A. at (800) 642-2444 to locate existing utilities prior to excavation. The Contractor is responsible for determination of utility depths.

1.6 PRODUCT STORAGE & HANDLING

A. Storage: Protect materials from damage.

B. Handling: Keep interiors of pipes, fittings and accessories clean at all times.

1.7 MAINTENANCE

A. Provide maintenance for the irrigation system as specified in Section 32 93 50 (Maintenance of Landscaping) until Final Acceptance by the Owner.

1.8 WARRANTY

A. Warrant the installed irrigation system to be free from defects in materials and/or workmanship as well as from significant deviations from the Contract Documents for a period of one year after Final Acceptance.

B. Perform corrective work as indicated on the 'Guarantee of Irrigation System' form at the end of this Section.

PART 2 - PRODUCTS

2.1 BACKFLOW PREVENTION ASSEMBLY

A. Backflow Prevention Device: As specified on the drawings unless otherwise required by local code.

B. Nipples and fittings: As specified on the drawings unless otherwise required by local code.

2.2 VALVES

A. As specified on the drawings.

B. Valve Boxes:
1. Rainbird VB series or Carson-Brooks plastic grade level enclosures (with 'T-cover' lids) unless otherwise noted in the drawings.
2. Size as required.
3. Green color.

C. Tags for Remote Control Valves: Pre-printed plastic I.D. tags as manufactured by T. Christy Products.

2.3 AUTOMATIC IRRIGATION CONTROL

A. Controller: See Irrigation Legend.

B. Control Wire: AWG-UF type solid, plastic insulated cable, 24 volt rated for direct burial application (14 gauge minimum).

C. Direct bury splice kit for connection of remote control valve wires shall be 3M Brand DBY Direct Bury Splice Kit.

2.4 PLASTIC PIPING

A. All pipe must be marked with the Manufacturer's name, nominal pipe size, schedule or class, pressure rating in P.S.I., date of extrusion, and National Sanitation Foundation seal of approval.

B. Pipe and fittings shall be manufactured of Type 1, Grade I or II, 2000 P.S.I. design stress compound designated as P.V.C. 1120 or 1220.

C. Mainline and Sleeves:
1. Schedule 40 Polyvinyl Chloride pipe
2. Conform to ASTM Designation D1785-60T for rigid P.V.C. compounds.

D. Lateral Lines:
1. Minimum Class 200 Polyvinyl Chloride pipe.
2. Conform to ASTM designation D 1784 for rigid P.V.C. compounds.

E. Schedule 80 Nipples: Conform with ASTM designation D 2464 and D 2467 and be listed with NSF.

F. Plastic Fittings: Schedule 40 Polyvinyl Chloride

G. Pipe shall be homogenous throughout and free from visual cracks, holes, or foreign materials. Pipe shall be free from blisters, wrinkles, and dents.

H. P.V.C. Primer: P-70 Weld-On or approved equal.

I. P.V.C. Solvent Cement:
1. For Mainline and all slip fittings under constant pressure: 711 Weld-On or approved equal.
2. For lateral lines: IPS 705 (Clear) Weld-On or approved equal.

J. Pipe Compound: Rector Seal pipe thread compound, Permatex #2 or approved equal.

2.5 DRIP IRRIGATION

A. Pressure Compensating Subterranean Dripperline:
1. Rainbird XFS-CV self-cleaning, pressure compensating dripperline with integral check valves.
2. See plan for emitter spacing and discharge rate.

B. Fittings: Rainbird XF

C. Line Flushing Valve: See Plan and Detail

D. Staples: 18' (prior to bending), galvanized 12 gauge wire 'U' staples.

2.6 GEOTEXTILE FABRIC

A. 3 ounce spunbonded polypropylene fabric as manufactured by Fabrico Inc. (800) 992-0550

PART 3 - EXECUTION

3.1 BACKFLOW PREVENTION ASSEMBLY:

A. Install backflow assembly as required by local codes, the Contract Documents and the Manufacturer's specifications.

3.2 VALVES

A. Install in planted areas (shrub areas whenever possible) near plan locations.

B. Pavers or stepping stones are not required for the support of Rainbird boxes (supercedes details).

C. Securely attach valve I.D. tags to each remote control valve. Controller and station numbers shall correspond to those provided on the plans.

3.3 AUTOMATIC CONTROL

A. Controller:
1. See plan for approximate location. Actual locations shall be approved by the Owner's Representative prior to installation.
2. Mount controller as per Detail and in accordance the Manufacturer's specifications.
3. Provide connections to the remote control valves, sensors (if applicable) and to the power source as well as all other labor, equipment, and material to make the control system fully operational.
4. Connect the remote control valves to the controller in the sequence shown on the plans.

B. Wiring (low voltage)
1. White wire only will be used as common ground between valves.
2. Control wire shall be minimum 14 gauge. Upsize wire as necessary to carry proper voltage according to the valve manufacturer's specifications.
3. Place wiring in mainline trenches whenever possible.
4. Tape wiring together at intervals of 20 feet.
5. Provide expansion loops of 6 inches every 20 Feet and at each directional turn.
6. Enclose splices in a valve box and connect wires with a Direct Bury Splice Kit. Mark locations on 'as-built' plans.
7. All wiring under paving shall be placed in Schedule 40 P.V.C. pipe sleeves.

C. Programming:
1. Erosion damage, hazards, and plant deaths due to improper watering shall be corrected immediately; adjust program to prevent recurrence.
2. Controller schedules provided on the plans in no way limit the Contractor's full responsibility for controller programming.

D. Install within the cover of the irrigation controller:
1. One (1) set of As-Built Irrigation Plans reduced to 8½' x 11' and sealed in a clear plastic laminate.
2. A waterproof Controller Schedule showing valve station numbers, the corresponding planting type, irrigation type, exposure to sunlight, and location. For example: Sta. A-11 / Turf / Rotors / Full Sun / West of Bldg. 2

3.4 TRENCHING:

A. Minimum Depth of Cover (below finish soil grade):
1. Mainlines: 18 inches.
2. Control wires: 18 inches.
3. Lateral lines: 12 inches.
4. Pipe passing under paving: 24 inches.

B. Bedding:
1. Remove all rubbish and rocks (½ inch in diameter or larger) from trenches.
2. Provide a firm, uniform bearing for the entire length of each pipe line.
3. If rocks are too numerous for removal, pad trenches with screened dirt or sand to a depth double the average rock diameter.

3.5 PIPE & FITTINGS

A. Place pipe passing under paving in sleeves.

B. Snake pipe from side to side of trench bottom to allow for expansion and contraction.

C. Line Clearance:
1. Maintain a minimum horizontal clearance of 4 inches between irrigation lines and 6 inches from lines of other trades.
2. Parallel lines shall not be installed directly over one another.

D. P.V.C. Pipe and Fittings Assembly:
1. Thoroughly clean pipe and fittings before applying pipe dope, primer or solvent.
2. Threaded Connections:
a. Use Pipe compound on all threaded fittings.
b. Apply light wrench pressure to threaded fittings.
c. Work all metal to metal thread connections first.
3. Make solvent weld joints in accordance with the pipe and solvent manufacturer's recommendations. Apply primer prior to the application of solvent.

E. Flushing the System:
1. Immediately prior to installation of sprinklers, bubblers or drip tubing, thoroughly flush lateral pipe and mainline.
2. Flush pipe, tubing and other components exposed to internal contamination prior to closing or reclosing each system.

3.6 BACKFILLING

A. Initial Backfill:
1. Fine granular material with no particles larger than ½ inch in size to a depth of 6 inches over the pipe.
2. Compact backfill under and on each side of pipe, for the length of the pipe.

B. Compaction:
1. Compact backfill to dry density equal to the adjacent undisturbed soil. Conform to adjacent grades without dips, sunken areas, humps, or other irregularities.
2. Never use vehicle wheels for compacting backfill.

3.7 DRIP IRRIGATION

A. Install in accordance with the Contract Documents and manufacturer's specifications.

B. Stake dripperline at a minimum spacing of four feet (4') on center.

C. Within 3 inches of non-rigid hose or tubing, bedding and backfill material shall be fine granular soil with no rocks or foreign matter larger than ½ inch in size.

D. Prevent contamination of lines during installation. Cap lines which are not being worked.

E. Flushing the System:
1. After non-rigid lines are in place and connected, and prior to installation of flush valves and/or end caps, thoroughly flush the system.
2. Re-flush the system monthly or 3 times total, whichever is greater, prior to Final Acceptance.

F. Depth of Dripperline:
1. Three inches below the finished soil grade in new planter areas.
2. On-grade in existing planters.

3.8 INSPECTIONS & TESTING

A. Expose installed work for inspection upon request of the Owner's Representative.

B. Perform tests in the presence of the Owner's Representative. Provide a minimum of forty eight (48) hours notice, in advance, for inspections and testing.

C. Hydrostatic Test:
1. Do not backfill mainline fittings or joints until testing is completed.
2. Test mainline with water at 125 P.S.I. for a period of 1 hour. Do not re-pressurize the system during the test period. Any detectable loss of pressure shall indicate test failure.
3. Repair and retest systems which fail the hydrostatic test.

D. Coverage Test:
1. When the irrigation system is completed, observe each station in operation to determine if coverage is complete and adequate.
2. Furnish all materials and perform all work required to correct any inadequacies in coverage due to field conditions or deviations from plans.

3.9 AS-BUILT PLANS

A. During the installation of the system, maintain shop drawings of actual mainline and valve locations as well as all location or quantity changes including, but not limited to, control and constant pressure components.

B. As-built drawings are subject to the approval of the Owner's Representative for clarity, accuracy and adequacy. Resubmit until drawings are acceptable.

3.10 CERTIFICATION SERVICES

A. Provide water efficient landscape certification and documentation services in accord with the applicable Water Efficient Landscape Ordinance including, but not limited to:
1. Certificate of Completion
2. Certificate of Installation
3. Irrigation Scheduling
4. Schedule of Landscape and Irrigation Maintenance

3.11 CLEAN UP

A. Keep all paved areas and areas adjacent to the project swept and hosed clean.

B. Remove all surplus materials, equipment, and debris, incidental to this work daily.

END OF SECTION 32 84 00

GUARANTEE OF IRRIGATION SYSTEM

We hereby guarantee that the irrigation system we have furnished and installed is free from defects in materials and workmanship, and the work has been completed in accordance with the Drawings and Specifications. We agree to repair or replace any defects in materials or workmanship, including any settling of backfilled trenches, which may develop during the period of one year from the date of Final Acceptance by the Owner and we will repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the Owner. Damages due to vandalism, theft, acts of nature, ordinary wear, and neglect are not covered under this Guarantee. We shall make such repairs or replacements, including complete restoration of all damaged planting, paving or other improvements of any kind, within ten (10) calendar days, as determined by the Owner, after receipt of written notice. In the event of our failure to make such repairs or replacements within ten (10) calendar days, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

Project:

Location:

Contractor:

License Number:

Address:

Telephone:

Owner:

Date of Final Acceptance:

Signature of Contractor's Authorized Representative:

SECTION 32 91 00 PLANTING PREPARATION

PART 1 - GENERAL

See Section 32 84 00, Part 1 (General)

1.1 SUMMARY

A. Section Includes, but is not limited to:
1. General Planting Requirements
2. Site Preparation
3. Soil Testing
4. Soil Preparation and Fertilization
5. Finish Grading of Planting Areas

B. Related Sections
1. Section 32 84 00 - Planting Irrigation
2. Section 32 93 00 - Plants
3. Section 32 93 50 - Maintenance of Landscaping

1.2 DEFINITIONS

See Section 32 84 00, Part 1 (Definitions)

1.3 SUBMITTALS

A. See Section 32 84 00, Part 1 (Submittals)

B. Delivery Receipts: Immediately submit written certification of material quantities upon request of the Owner' Representative.

C. Have 1 copy of the Landscape Soils Test(s) emailed directly from the testing lab to the Owner's Representative, as soon as results are available.

D. Herbicides, Fungicides and Pesticides
1. Submit, in writing to the Landscape Architect, the following:
a. Chemicals to be used.
b. Rate of application.
c. Method of application.
d. Name of applicator.
e. Area to which chemicals will be applied.
2. If special permits are required for the chemicals to be used, they shall be obtained from the County Agricultural Commissioner and submitted to the Landscape Architect.
3. Proposed chemicals must be approved in writing by the Landscape Architect prior to use.

1.4 QUALITY ASSURANCE

See Section 32 84 00, Part 1 (Quality Assurance)

1.5 JOB CONDITIONS

See Section 32 84 00, Part 1 (Job Conditions)

1.6 PRODUCT DELIVERY AND STORAGE

A. Deliver fertilizer in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade mark and conformance to State Law.

B. Materials stored on the project site shall be protected from damage.

PART 2 - PRODUCTS

2.1 SOIL ADDITIVES

A. Fertilizer: 'Best' 6-24-24XB as manufactured by J.R. Simplot Company.

B. Soil Amendments (as required):
1. Lime: Agricultural Liming Grade Dolomite.
2. Ammonium sulfate (21-0-0)
3. Agricultural Gypsum.

C. Soil Conditioner:
1. Nitrolized redwood sawdust (.5% actual nitrogen), or Cedar sawdust (.5% actual nitrogen), or Fir Bark (1% nitrogen). Pine is unacceptable.
2. Minimum 80% passing 1/8" screen and minimum 95% passing 1/4" mesh screen.
3. Carbon to Nitrogen (C/N) ratio shall not exceed 32:1.

2.2 PLANTING SOILS

A. Imported Topsoil:
1. Fertile, friable soil of loamy character having an amount of humus normal to the region with a Ph. between 6.5-7.5. Clay particles shall not exceed 25% by volume.
2. Free from subsoil, refuse, roots, and rocks over 2" in diameter, noxious weeds and brush, nematodes, or other harmful material and be capable of sustaining healthy plant life.
3. A soils test (see Article 3.1) shall be provided to the Landscape Architect for approval prior to delivery to the site.

B. Approved On-Site Soils:
1. Topsoil may be stripped and stockpiled on site prior to rough grading operations provided all weeds, rocks over 4" in size and debris are removed, and that soil is suitable for landscape purposes.
2. Soil that has been covered with pavement or gravel is not acceptable.
3. Break up all lumps or clods before spreading.

2.3 HERBICIDE:

'Round-up' as manufactured by Monsanto or equal approved by the Landscape Architect.

PART 3 - EXECUTION

3.1 SITE PREPARATION

A. Site Clearance
1. Protect all existing vegetation in planters to remain.
2. Remove weeds in existing planters to remain.

B. Soil Contamination:
1. Protect planting areas from contamination.
2. Notify the Owner's Representative of all soil in planting areas containing substances toxic to plants.
3. If contamination was not caused by the operations of any of the project contractors and could not have been detected prior to bidding, a change order may be submitted for the corrective work.
4. Upon the approval of the Owner's Representative:
a. Remove and dispose of all affected soil.
b. Fill excavated area with approved on-site soils or imported topsoil.
5. Replace plants damaged due to known contamination, where the Owner's Representative was not notified of the situation, after uncontaminated soil has been substituted, at no additional cost to the Owner.

C. Compacted Planting Areas:
1. Protect proposed planting areas from mechanical compaction equipment where feasible.
2. Unless shown otherwise in the drawings, mechanically compacted planting areas shall be broken up to a depth of 18 inches.

D. Soils Test (Imported)
1. Test soil for the approval of the Owner's Representative prior to delivery to the site.
2. Perform one soils test for each soil source or one for each different soil condition, whichever quantity is greater.
3. Take a minimum of 10 different samples (1/4 cup each) for each soils test required at multiple depths ranging from 1 inch to 12 inches. Thoroughly mix samples.
4. Clean testing tools and containers prior to collecting samples.
5. Test soil for: ph, organic matter, estimated nitrogen release, soil texture, salinity, nitrate nitrogen, phosphate, potassium, calcium, magnesium, sulfur, copper, iron, zinc, manganese, sodium, sodium absorption ratio, boron, cation exchange capacity and percent base saturation of cation elements.

E. Fill Placement:
1. Where imported or approved on-site soil is placed over existing soil, the subgrade shall be ripped to a minimum depth of 4 inches. A 4 inch maximum depth of fill material shall be tilled into the existing soil prior to adding additional fill material.
2. Fill material deeper than 8 inches below finish grade shall be compacted in 6" lifts to 80%.

3.2 SOIL PREPARATION (New planters only)

A. No soil preparation is required in existing planters to remain.

B. Apply additives at the rates indicated by the applicable soils test.

C. Rototill all planting areas to a minimum of 6" to 8" until soil condition is loose and friable.

D. Remove all rocks 2" in diameter or larger and visible at the soil surface.

E. Do not rototill on slopes 2 to 1 or greater in ratio. Manually scarify the soil to a depth of 1 inch.

F. Control dust in area within the scope of this contract.

3.3 FINISH GRADING

A. Coordinate rough grading to within two tenths of one foot (0.2') of finish grade.

B. Finish grades shall be shaped without any abrupt changes in gradient and present a uniform appearance.

C. All finish grades, including top-dressing, shall be 1 inch below the surface of all paved areas.

D. Eliminate all existing erosion or construction scars within contract limits.

E. Maintain a 2% minimum slope away from structures.

F. All landscape areas shall slope to drainage structures (drain inlets, gutters, etc.) or pavement at a minimum slope of 1%.

G. Do not work the soil when moisture content is excessive or inadequate.

H. Where filling is necessary to bring low areas up to finish grade, approved on-site soil is most desirable with imported topsoil being an acceptable alternative. Thoroughly cultivate fill material into existing soil to a depth of 4-6 inches.

3.4 INSPECTIONS

A. Notify the Owner's Representative 48 hours in advance for inspections. Do not proceed to the next stage of work in an area without the approval of the Owner's Representative.

B. An inspection is required prior to planting, when finish grading has been completed.

3.5 CLEAN UP

A. Keep all paved areas and areas adjacent to the project swept and hosed clean.

B. Remove all surplus materials, equipment, and debris on a daily basis.

END OF SECTION 32 91 00

Garth Ruffner Landscape Architect (916) 797-2576
4120 Douglas Blvd., Suite 306, #251, Roseville, CA 95746-8536
GarthRuffner.com California# PLA #2806

LANDSCAPE SPECIFICATIONS

LICENSED LANDSCAPE ARCHITECT
GARTH RUFFNER LA #2806
12/12/23
SIGNATURE
5/31/24
RENEWAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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DATE 12.12.23
DRAWN GR
JOB NO. 21027 (43062)
SHEET L4
OF 5 SHEETS

SECTION 32 93 00 - PLANTS

PART I - GENERAL

See Section 32 84 00, Part 1 (General)

1.1 SUMMARY

A. Section Includes, but is not limited to:
1. Planting Preparation
2. Planting
3. Stake Trees
4. Top Dressing
5. Erosion Control Blanket
6. Pre-Emergent Weed Control

B. Related Sections
1. Section 32 84 00 - Planting Irrigation
2. Section 32 91 00 - Planting Preparation
3. Section 32 93 50 - Maintenance of Landscaping

1.2 DEFINITIONS

See Section 32 84 00 (Definitions)

1.3 SUBMITTALS

A. See Sections 32 84 00 and 32 91 00 (Submittals)

B. Submit requests for substitutions on unavailable plants to the Landscape Architect within 15 days of signing the contract or 2 months before planting, whichever occurs later. Late requests for substitutions will be denied if any source can be found for the material.

C. Immediately submit Delivery Receipts for all plant materials on site upon request of the Owner's Representative.

1.4 QUALITY ASSURANCE

A. See Section 32 84 00 (Quality Assurance)

B. All plant materials shall comply with Federal and State laws requiring inspection for plant diseases and pest infestations. Inspection certificates, required by law, shall accompany each shipment of plants. Clearance from the County Agricultural Commissioner, as required by law, shall be obtained before planting plant materials delivered from outside the County in which they are to be planted.

1.5 JOB CONDITIONS

See Section 32 84 00 (Job Conditions)

1.6 PRODUCT DELIVERY, STORAGE & HANDLING

A. Delivery: Reject damaged and inadequate plants before the departure of the delivery vehicle.

B. Storage:
1. Protect materials stored on the project site.
2. Root-balls shall be shaded and protected from temperatures greater than 90 degrees.
3. Maintain the health of stored plants.

C. Handling:
1. Replace dropped plant materials.
2. Do not carry plants by stems or trunks.

1.7 WARRANTY

A. Complete and sign the 'Guarantee of Trees, Shrubs and Groundcover' form, included at the back of this Section, and submit it to the Owner prior to Final Acceptance.

B. Replace warranted plants as indicated on the 'Guarantee of Trees, Shrubs and Groundcover' form.

PART 2 PRODUCTS

2.1 PLANTING SOIL

A. See Section 32 91 00.

2.2 SOIL ADDITIVES

A. See Section 32 91 00, Part 2 (Soil Additives)

2.3 PLANT MATERIALS:

A. A copy of this portion of the specifications (Article 2.3) shall accompany all requests to nurseries for price quotes and deliveries.

B. Order the required quantity of plants (including a reasonable quantity of replacement plants) within ten working days of signing the contract or one month prior to planting, whichever occurs later.

C. The Landscape Architect reserves the right to change the plant material specified based upon soil test results and recommendations at no additional cost.

D. Plants shall have a form typical to the species or variety shown on the plans and shall be individually tagged by genus, species/cultivar.

E. Keep root-balls moist.

F. Plants shall be free of pests (insects, pathogens, nematodes or other injurious organisms).

G. An inspection of tree crowns and trunks shall find the following characteristics:
1. Crown Form: The form or shape of the crown is typical for a young specimen of the species/cultivar. The crown is not significantly deformed by wind, pruning practices, pests or other factors. Trees shall have a single, relatively straight central leader and tapered trunk (unless specified as 'multi-trunk'), free of co-dominant stems and vigorous, upright branches that compete with the central leader. If the original leader has been headed, a new leader at least ½ the diameter of the original leader shall be present.
2. Leaves: The size, color and appearance of leaves should be typical for the time of year and stage of growth of the species/cultivar. Leaves are not stunted, misshapen, tattered, discolored (chlorotic or necrotic) or otherwise atypical.
3. Branches: Shoot growth throughout the crown is typical for the age/size of the species/cultivar. Branches do not have dead, diseased, broken, distorted or other serious injuries.
a. Main branches should be distributed radially around the trunk, well spaced, and diameter shall be no greater than of the trunk (measured 1 inch above the branch). Branches shall be free of included bark.
b. Temporary branches should be present along the lower trunk and no larger than 3/8" in diameter.
4. Trunks: The tree trunk should be fairly straight, vertical and free of wounds (except properly made pruning cuts), sunburned areas, Fungal Fruiting bodies, wood cracks, bleeding areas, signs of boring insects, galls, cankers, lesions and girdling ties.
5. Tree height and trunk diameter shall be typical for the age, species/cultivar and container size. Trunk diameter at 6" (six inches) above the soil surface shall be within the range shown below:
a. 5 gallon 0.5" to 0.75"
b. 15 gallon 0.75" to 1.5"
c. 24 inch box 1.5" to 2.5"

H. Root-Balls
1. The plant shall be well rooted in the soil mix. When the container is removed, the rootball shall remain intact. When the trunk is carefully lifted both the trunk and root system shall move as one.
2. The upper-most roots shall be within 1" of the soil surface.
3. Circling roots in close proximity to the root crown and circling roots greater than 1/4 inch in diameter at the perimeter of the root-ball are unacceptable.
4. Kinked roots (a greater than 90 degree bend) occurring above the top 20% of the root system are unacceptable.
5. The root mass at the bottom of the root-ball shall not exceed 1/4 inch in depth. Roots shall be in a healthy condition; black roots shall be grounds for rejection.
6. At time of inspection and delivery, the rootball shall be moist throughout, and the tree crown shall show no signs of moisture stress, as indicated by wilt, shriveled, dead leaves, or branch dieback. Roots shall show no signs of being subjected to excess soil moisture conditions, as indicated by root discoloration, distortion, death, or foul odor.

I. If more than 20% of any one species or variety of plant materials are found to be unacceptable, the Owner's Representative reserves the right to reject the entire lot or lots of plants represented by the defective samples.

J. The Owner's Representative reserves the right to reject any plant material at any time until Final Acceptance.

2.4 STAKING

A. Tree Stakes:
1. Untreated lodgepole pine.
2. For 15 gallon containers and smaller, stakes shall be a minimum of ten feet (10') in length and two inches (2") in diameter.
3. For 24" box and larger trees, stakes shall be a minimum of twelve feet (12') in length and three inches (3") in diameter.

B. Tree Ties: Shall be 'Cinch Ties' by V.I.T. Products.

2.5 PRE-EMERGENT HERBICIDE:

'Surflan' containing the active ingredient oryzalin.

2.6 TOP DRESSING:

A. General landscape areas shall be top dressed with 'Medium Walk-on Bark' or pre-approved equal.

B. Shredded bark products are not acceptable.

2.7 EROSION CONTROL BLANKET:

A. #SC-150 as Manufactured by Tensar. (800)772-2040

B. Stakes: 'GreenStake' 4 inch bio-degradeable stakes by VivaGreen Group (877) 205-2400.

PART III - EXECUTION

3.1 PLANTING PREPARATION

A. See Section 32 91 00, Part 3 (Soil Preparation).

B. Where poor drainage conditions are encountered (including hardpan within four feet of finished grade) and remediation measures are not indicated in the Drawings:
1. IMMEDIATELY notify the Owner's Representative and the Landscape Architect. Do not proceed with planting operations without approval from the Owner's Representative.
2. Provide a lump sum extra services cost for remediation measures as directed by the Landscape Architect.
3. Upon approval of the extra services cost by the Owner's Representative, install remediation measures as directed by the Landscape Architect.
4. If poor drainage conditions are not brought to the attention of the Owner's Representative, drainage remediation (as directed by the Landscape Architect), irrigation repairs and plant replacement shall be implemented at no additional cost.

C. Thoroughly irrigate finish graded soil to a point just before run-off occurs prior to any planting so that a minimum of 4 inches of water passes through the soil profile beyond the root zone. Allow planting areas to dry sufficiently to support workers and their equipment.

3.2 PLANTING

A. Plant locations noted on the plans as an area to be planted with a specified material and spacing:
1. Install in orderly, straight rows parallel to structures, curbs, walks, fences, etc.
2. Install in triangular spacing, unless otherwise noted on plans.

B. Backfill Mix: planting soil with 2% lbs. of 6-20-20 per cubic yard of mix. Soil conditioner is not required regardless of soils test results.

C. Watering
1. Manually water backfill to thoroughly consolidate soil around the rootballs.
2. Dry root balls will repel water supplied by the subsurface drip system and supplemental watering may be necessary to keep root balls moist during establishment.

D. Tree Staking:
1. ALL NURSERY STAKES SHALL BE REMOVED PRIOR TO STAKING.
2. Stake immediately after planting.
3. Locate stakes perpendicular to the prevailing winds to divide the wind load between the stakes rather than concentrating it on one upwind stake.
4. Secure trees which are excessively limber due to insufficient caliper size with four tree ties.

E. Rejection of Plant Material:
1. The Owner's Representative reserves the right to reject any plant material.
2. Immediately replace any rejected plant material.
3. Replacements shall be of like type and size unless otherwise indicated by the Landscape Architect.

3.3 PRE-EMERGENT WEED CONTROL

A. Apply pre-emergent to all shrub and groundcover areas prior to spreading top dressing and after completion of all planting and one complete watering.

B. Apply pre-emergent herbicide at 2-1/2 lbs. per 1000 S.F. with strict adherence to Manufacturer's application directions.

3.4 EROSION CONTROL BLANKET:

A. Install blanket on all planted slopes steeper than 4:1 (25%). This condition will definitely occur between the accessible ramp and public sidewalk.

B. Excavate a 6" depth by 6" width trench across the top of slope (protect subsurface irrigation). Place top of blanket in trench, staple at 36" min. on center. Backfill and compact the trench.

C. Roll out each blanket parallel to the direction of the slope, with staples at 36 inches on center in a triangular pattern. Overlap sides of blankets by 2 inches.

D. Cut blanket in an 'X' pattern at plants. Carefully place around the plant.

3.5 TOP DRESSING

A. Minimum depth shall be 3 inches in all planter areas.

B. Do not install top dressing over erosion control blankets in areas subject to concentrated surface water flows.

C. Remove top-dressing from foliage immediately.

D. Maintain a minimum clearance of 3 inches around tree trunks and 1 inch from all other plant bases or trunks.

3.6 INSPECTIONS

A. Notify the Owner's Representative 48 hours in advance for inspections. Do not proceed to the next stage of work in an area without the approval of the Owner's Representative.

B. An Inspection is required at the following stages of work:
1. Delivery of plant materials to the site.
2. At the completion of planting operations.

3.7 CLEAN UP

A. Keep all paved areas and areas adjacent to the project swept and hosed clean.

B. Remove all surplus materials, equipment, and debris on a daily basis.

END OF SECTION 32 93 00

GUARANTEE OF TREES, SHRUBS & GROUNDCOVER

A. We hereby guarantee that the plant materials we have furnished are of the type specified and are planted in accordance with the Drawings and Specifications.
B. We agree to replace any plant materials that die after Final Acceptance (except as limited in Item E) during the period specified below:
1. 24"Box and larger 90 days
2. 15 Gallon container 60 days
3. 5 Gallon container 30 days
4. 1 Gallon container 30 days
C. We agree to replace plants which are not of the type specified for a period of one year after Final Acceptance.
D. Replacements shall be of like type and size and replaced plant materials shall be guaranteed for the same time as stated in Item A commencing from the time the replacement was planted.
E. We will replace all plants that die after Final Acceptance and during the Guarantee period, unless plant deaths are due to vandalism, theft, acts of nature, or neglect by the Owner or the Owner's Maintenance Personnel.
F. We will repair or replace any damage resulting from the replacement of dead plant materials at no additional cost to the Owner.
G. We shall make such replacements, including complete restoration of all damaged planting, paving or other improvements of any kind, within ten (10) calendar days after receipt of written notice from the Owner. In the event of our failure to make such repairs or replacements within ten (10) calendar days, we authorize the Owner to proceed to have said replacements made at our expense and we will pay the costs and charges therefore upon demand.

Project:

Location:

Contractor:

Address:

License Number: Telephone:

Owner:

Date of Final Acceptance:

Signature of Contractor's Authorized Representative:

SECTION 32 93 50 - MAINTENANCE OF LANDSCAPING

PART 1 - GENERAL

See Section 32 84 00, Part 1 (General)

1.1 SUMMARY

A. Section Includes, but is not limited to:
1. Irrigation Maintenance
2. Plant Maintenance
3. Landscape Maintenance Period

B. Related Sections
1. Section 32 84 00 - Planting Irrigation
2. Section 32 91 00 - Planting Preparation
3. Section 32 93 00 - Plants

1.2 DEFINITIONS

See Section 32 84 00 (Definitions)

1.3 SUBMITTALS

See Sections 32 84 00 and 32 91 00 (Submittals)

1.4 QUALITY ASSURANCE

See Sections 32 84 00 and 32 91 00 (Quality Assurance)

1.5 JOB CONDITIONS

A. See Section 32 84 00 (Job Conditions)

B. Maintain all landscape work from the time of installation until Final Acceptance.

C. Damage or loss of landscape work:
1. Protect, repair and/or replace as necessary to conform to the Construction Documents, regardless of the cause of the damage or loss, until Final Acceptance.
2. If repair and/or replacement costs due to unusual and uncontrollable conditions exceed 5% of the value of the landscape contract or subcontract, additional payment may be negotiated. Proceed with work during any negotiations.

1.6 PRODUCT STORAGE

See Section 32 91 00 (Product Delivery and Storage)

PART 2 PRODUCTS

2.1 FERTILIZER:

Ammonium sulfate (21-0-0)

2.2 CHEMICALS:

A. General Herbicide: 'Round-up' manufactured by Monsanto or equal approved by the Landscape Architect.

B. Selective Herbicides, Fungicides and Insecticides: Subject to the approval of the Landscape Architect prior to application.

PART 3 - EXECUTION

3.1 IRRIGATION

A. Monitor and repair the irrigation system as necessary to insure efficient operation and maintain conformance with the Contract Documents.

B. Apply water to all planted areas during construction operations and thereafter until Final Acceptance.

C. Water planted areas which cannot be watered efficiently with the existing irrigation system using alternative means.

D. Apply water in sufficient quantities and as often as seasonal conditions require to keep all planted areas appropriately moist at all times.

3.2 TREES, SHRUBS & GROUNDCOVER

A. Fertilizing:
1. Apply Ammonium sulfate at a rate of 5 lbs. per 1,000 square feet 30 days after the start of the Maintenance Period and at 30 day intervals for the duration of the Maintenance Period.
2. Fertilization is not required for any portion of the Maintenance Period that occurs between October and January.
3. Immediately after application, wash fertilizer off foliage.
4. Spray fertilized ground with water until fertilizer has dissolved.

B. Replacement of Plants:
1. Replace all non-specified plants, missing plants, dead plants and plants not in vigorous growing condition, as determined by the Owner's representative, within 2 weeks of notification.
2. Replacement plants shall conform to the Contract Documents, unless otherwise directed by the Landscape Architect.

C. Pruning:
1. Do not prune trees or shrubs with low growing foliage up from the ground unless instructed to do so by Landscape Architect.
2. Prune as necessary to prevent damage to branches.
3. Do not shear foliage under any circumstances.

D. Weed Control:
1. Remove weeds at intervals of not more than 7 days beginning with installation and continuing until Final Acceptance.
2. Treat existing or recurring noxious weeds with an approved herbicide, in accord with the manufacturer's specifications, in successive treatments until roots are killed. Remove the entire weed, including significant roots.
3. Take extreme care during herbicide application to prevent contact with plants which are to remain.

E. Pest and Disease Control: Apply approved chemicals to turf as necessary to control weeds, pests and fungi in accord with the Manufacturer's specifications.

3.3 TRASH REMOVAL

A. Thoroughly police all planting areas at intervals of not more than 7 days beginning with installation and continuing until Final Acceptance.

B. All planted areas shall be kept free of trimmings, papers, rubbish, and other objectionable materials.

3.4 MAINTENANCE PERIOD

A. Beginning the Maintenance Period:
1. When all planting and irrigation work has been completed, the Owner's Representative will prepare a Punch List designating items to be corrected.
2. Correct Punch List items within 10 working days of the date of issuance.
3. If the Owner's Representative determines work is sufficiently complete, Provisional Acceptance may be given prior to completion of the Punch List items.
4. The Maintenance Period shall begin with Provisional Acceptance of the work, in writing, by the Owner's Representative.
5. If Provisional Acceptance is granted and Punch List items are not complete within 10 working days, the Maintenance Period will be stopped until all Punch List items are corrected.

B. The Maintenance Period shall be 60 calendar days.

C. Perform all maintenance operations described in this Section throughout the Maintenance Period.

D. Any period that the Contractor fails to adequately meet the maintenance standards set forth in this Section, as determined by the Owner's Representative, will not be credited as part of the Maintenance Period.

E. Concluding the Maintenance Period:
1. The Final Inspection shall be made at the conclusion of the Maintenance Period.
2. Contracted work, including the Maintenance Period, shall not be complete without the Final Approval of the Owner.

3.5 INSPECTIONS

A. Notify the Owner's Representative 7 days in advance for inspections. Do not proceed to the next stage of work in an area without the approval of the Owner's Representative.

B. An inspection is required at the following stages of work:
1. At the completion of all planting and irrigation.
2. At the close of the Maintenance Period.

3.6 CLEAN UP

A. Keep all paved areas and areas adjacent to the project swept and hosed clean.

B. Remove all surplus materials, equipment, and debris on a daily basis.

END OF SECTION 32 93 50

Garth Ruffner Landscape Architect (916) 797-2576
4120 Douglas Blvd., Suite 306 #251, Roseville, CA 95746-8536
GarthRuffner.com California# PLA #2808

LANDSCAPE SPECIFICATIONS

LICENSED LANDSCAPE ARCHITECT
GARTH RUFFNER LA #2808
12/12/23
SIGNATURE
5/31/24
RENEWAL
STATE OF CALIFORNIA

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
COUNTY JOB NO: WA20-103-3719-AG
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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DATE 12.12.23
DRAWN GR
JOB NO. 21027 (43062)
SHEET L5
OF 5 SHEETS

OFFSITE IMPROVEMENT PLANS
FOR
YOLO COUNTY AG DEPARTMENT SHOPS BUILDING

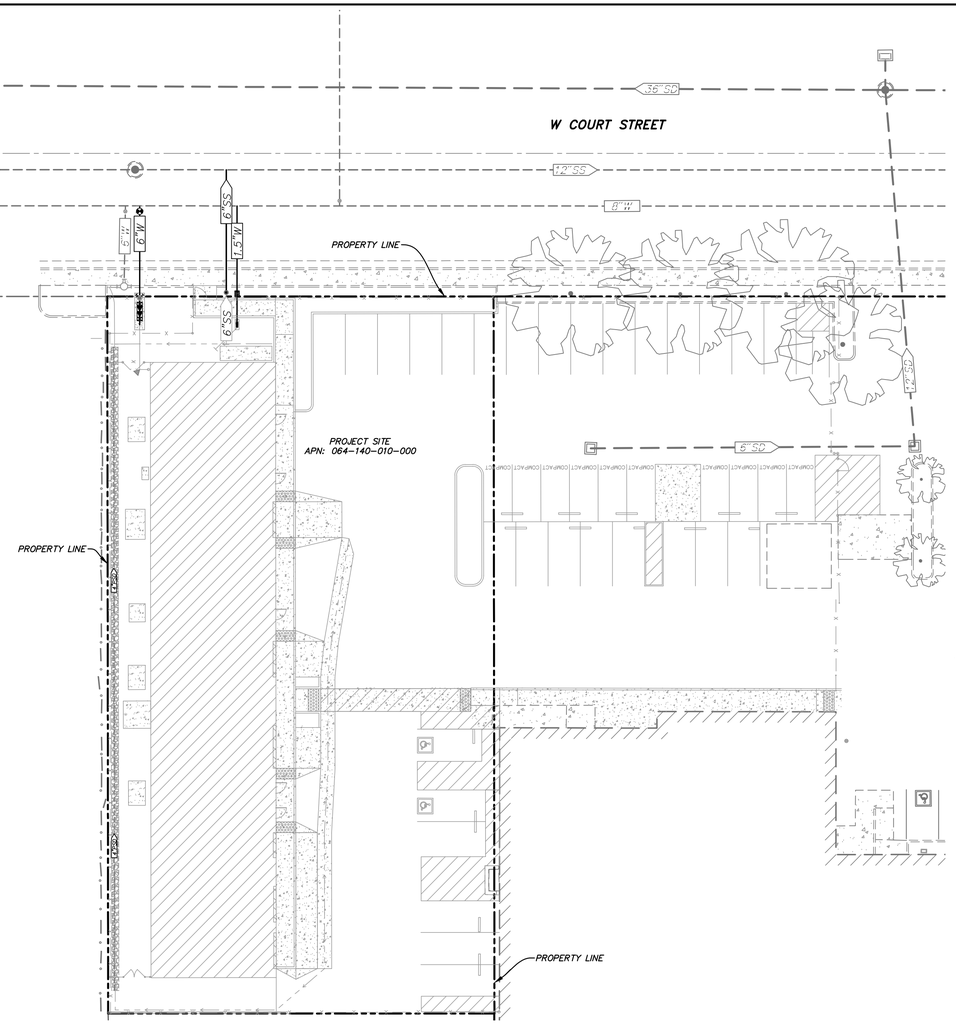
CITY OF WOODLAND — YOLO COUNTY, CA

LEGEND

PROPOSED	EXISTING	
12"SD	12" SD	STORM DRAIN AND MANHOLE
12"PSD		PERFORATED STORM DRAIN
6"SS	6" SS	SANITARY SEWER AND MANHOLE
	SS SRV	SANITARY SEWER SERVICE
8"SFM	8" SFM	SANITARY SEWER FORCE MAIN
P	P	SEWER PUMP STATION
		FIRE HYDRANT AND VALVE ASSEMBLY
10"W	10" W	WATER MAIN, VALVE, DOUBLE DETECTOR CHECK VALVE, METER & BLOWOFF VALVE
	W SRV	WATER SERVICE
JT JT	JT JT	JOINT UTILITY TRENCH
GAS GAS	GAS GAS	GAS MAIN
(UG)E	(OH)E (OH)E	ELECTRICAL LINE (UG–UNDERGROUND, OH–OVERHEAD)
(UG)T	(OH)T (OH)T	TELEPHONE LINE (UG–UNDERGROUND, OH–OVERHEAD)
SL SL	SL SL	STREET LIGHT CONDUIT, WIRING & PULL BOX
SL SL E2	SL SL	STREET LIGHT SERVICE POINT AT UTILITY CO. BOX
		STREET LIGHT AND POLE
		UTILITY POLE WITH DOWN GUY & ANCHOR
PP,TP,JP	PP,TP,JP	POWER POLE, TELEPHONE POLE, JOINT POLE
X X X X	X X X X	FENCE
		VERTICAL CURB, GUTTER & SIDEWALK WITH DRIVEWAY
		CATCH BASIN OR DRAINAGE INLET
		FLOWLINE OF DITCH OR SWALE
		DIRECTION OF SURFACE DRAINAGE FLOW
		CUT OR FILL SLOPE
		RIGHT OF WAY OR PROPERTY LINE
		STREET CENTERLINE OR BASELINE
		SURVEY MONUMENT
		SIGN
		TREE
		TREE TO BE REMOVED
		EXISTING GROUND SURFACE ELEVATION
58.60 FG 58.60 FL 59.10 TC 58.60 AC 58.60 FC 60.50± TC 60.00± FL 60.50± FC 60.50± AC 60.50± BEW	13.79 × 12.04	EDGE OF PAVEMENT AND ELEVATION FLOW LINE GRADE TOP OF CURB GRADE/ASPHALT GRADE FINISHED CONCRETE GRADE MATCH EXISTING GRADE (FIELD VERIFY)
		PUBLIC UTILITY EASEMENT
		ROLL CURB, GUTTER, & SIDEWALK
		CALTRANS RIGHT–OF–WAY

UTILITY REPRESENTATIVES

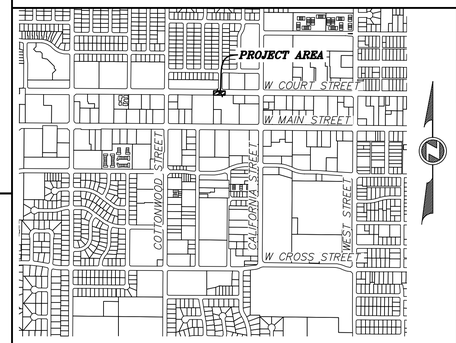
UTILITY	COMPANY	REPRESENTATIVE	PHONE NUMBER
GAS	P.G.& E.	SETH PEREZ	(530) 661–5668
ELECTRICITY	P.G.& E.	SETH PEREZ	(530) 661–5668
TELEPHONE	AT&T	LISA MARANO	(916) 484–2420
TELEPHONE	YOLO COUNTY TELECOMMUNICATIONS	TOM BATES	(530) 506–5012
CABLE TV	WAVE BROADBAND	FRANK BARGIEL	(916) 223–0123
USA			(916) 642–2444
WATER, SEWER & DRAINAGE	CITY OF WOODLAND	CRAIG LOCKE	(530) 661–5899
FIRE	CITY	FIRE MARSHALL	(530) 661–5855



OVERALL SITE PLAN

0 10 20 40
LM
SCALE: 1"=20'

VICINITY MAP



SHEET INDEX

No.	TITLE
1	TITLE SHEET
2	ABBREVIATIONS & GENERAL NOTES
3	UTILITIES PLAN
4	EROSION CONTROL & SEDIMENTATION PLAN

LM LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING
608 COURT STREET, WOODLAND, CALIFORNIA 95695 · PHONE: (530) 662–1755
P.O. BOX 828, WOODLAND, CALIFORNIA 95776 · FAX: (530) 662–4602

REGISTERED PROFESSIONAL ENGINEER · BRYAN P. BONINO · No. 41804 · CIVIL · STATE OF CALIFORNIA

PROJECT ENGINEER'S SIGNATURE
BY: B. P. Bonino
BRYAN P. BONINO
DATE: 01/04/2024 P.E. 41804

#464-81

PUBLIC IMPROVEMENTS FOR YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
120 W. MAIN STREET
WOODLAND, CA

BENCH MARK:
ELEVATION: 65.39 DATUM: NAVD88
DESCRIPTION: FD. 2–1/2" BRASS DISK IN MON. WELL STAMPED "YOLO COUNTY GPS SUBSIDENCE NETWORK LIBRARY 1999" 42' ± NE OF INTERSECTION OF COURT ST. & COLLEGE ST.

CITY OF WOODLAND
APPROVED BY:
BRENT MEYER – CITY ENGINEER
DATE:

SCALE: HORIZ. 1"=20' VERT. N/A
DATE: 01/04/2024

DESIGNED BY B. BONINO
DRAWN BY P. JAUREGUI
REVIEWED BY P. CHOATE
FILE: 464–81_F001.dwg

REVISIONS

NO.	DESCRIPTION	BY APPR.	DATE

TITLE SHEET

SHEET 1 OF 4

ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
ACP	ASBESTOS CEMENT PIPE
ARV	AIR RELEASE VALVE
ASB	AGGREGATE SUBBASE
AWWA	AMERICAN WATER WORKS ASSOCIATION
BC	BEGIN CURVE
BEW	BACK EDGE OF WALK
BM	BENCH MARK
BOC	BACK OF CURB
BOV	BLOW-OFF VALVE
BVC	BEGIN VERTICAL CURVE
BW	BASE OF WALL
CAMUTCD	CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
CATV	CABLE TELEVISION
C&G	CURB AND GUTTER
C,G,&SW	CURB, GUTTER AND SIDEWALK
CC	CENTER TO CENTER
CICP	CAST IN PLACE CONCRETE PIPE
CL	CENTERLINE, CONTROL LINE, CHAIN LINK OR CLASS
CO	CLEANOUT
COMM	COMMUNICATIONS
CONC	CONCRETE
CONST	CONSTRUCT
COR	CORNER
CP	CONCRETE PIPE
CR	CURB RETURN
CSP	CORRUGATED STEEL PIPE
DC	DOUBLE CHECK
DCA	DETECTOR CHECK ASSEMBLY
DI	DRAINAGE INLET
DIP	DUCTILE IRON PIPE
DR	DIMENSION RATIO
DTL	DETAIL
DW	DRIVEWAY
DWG	DRAWING
E	EAST
EC	END CURVE
ELEC	ELECTRIC(AL)
EL, ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EQUIV	EQUIVALENT
EVC	END VERTICAL CURVE
EX, EXIST	EXISTING
EXP JT	EXPANSION JOINT
FB	FLUSHER BRANCH
FC	FINISHED CONCRETE
FDC	FIRE DEPT CONNECTION
FEW	FRONT EDGE OF WALK
FF, FIN FLR	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FOC	FACE OF CURB OR CONCRETE
GB	GRADE BREAK
INTX	INTERSECTION
INV	INVERT
IRR	IRRIGATION
JB	JUNCTION BOX
JT	JOINT-USE TRENCH
L	LEFT
LF	LINEAL FEET
LOG	LIP OF GUTTER
LT	LEFT OR LIGHT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
MOC	MIDDLE OF CURVE
MON	MONUMENT
MRC	MINIMUM RELATIVE COMPACTION
MTD	MOUNTED
N	NORTH
NG	NATURAL GROUND
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OA	OVERALL
OH	OVERHEAD
PB	PULL BOX
PCC	PORTLAND CEMENT CONCRETE OR POINT OF COMPOUND CURVATURE
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
POC	POINT OF CONNECTION, POINT ON CURVE
PP	POWER POLE
PRC	POINT OF REVERSE CURVATURE
PRVC	POINT OF REVERSE VERTICAL CURVATURE
PROJ	PROJECTED
PROP	PROPERTY
PSE	PUBLIC SERVICE EASEMENT
PT	POINT
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
PVCP	POLYVINYL CHLORIDE PIPE
PVMT	PAVEMENT
PWD	PUBLIC WORKS DEPARTMENT
R	RADIUS, RADIAL OR RIGHT
RCP	REINFORCED CONCRETE PIPE
REQ'TS	REQUIREMENTS
RET	RETAINING
RP	RADIUS POINT OR REFERENCE POINT
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RT	RIGHT
R/W	RIGHT-OF-WAY
S	SOUTH OR SLOPE
SCH	SCHEDULE
SD	STORM DRAIN
SEC	SECTION
SEP	SEPARATION
SIM	SIMILAR
SL	STREET LIGHT
SP	SERVICE POLE
SS	SEWER SERVICE, SANITARY SEWER
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
SW	SIDEWALK
SYM	SYMMETRICAL
TC	TOP OF CURB OR CONCRETE
TEL	TELEPHONE
TEMP	TEMPORARY
TFOC	TOP FACE OF CURB
TP	TELE POLE
TRAF	TRAFFIC
TRANS	TRANSITION
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
VAR	VARIES OR VARIABLE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
W	WEST
WM	WATER METER OR WATER MAIN
WS	WATER SERVICE
XFMR	TRANSFORMER
XING	CROSSING

GENERAL NOTES:

1. STANDARDS AND PLANS:

A. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF THE CITY OF WOODLAND, 2021 STANDARD SPECIFICATIONS AND DETAILS, WITH THESE PLANS, THE PROJECT SPECIFICATIONS, AND WITH THE LATEST EDITIONS OF THE STATE "CALTRANS" STANDARD SPECIFICATIONS AND STANDARD PLANS, SIGN SPECIFICATION SHEETS AND TRAFFIC MANUAL AND THE 2014 CALIFORNIA MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES). THE CONTRACTOR SHALL OBTAIN AND USE ALL APPLICABLE ADDENDUMS.

B. IT IS INTENDED THAT THESE PLANS AND SPECIFICATIONS REQUIRE ALL LABOR AND MATERIALS NECESSARY AND PROPER FOR THE WORK CONTEMPLATED AND THAT THE WORK BE COMPLETED IN ACCORDANCE WITH THEIR TRUE INTENT AND PURPOSE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY REGARDING ANY DISCREPANCIES OR AMBIGUITIES WHICH MAY EXIST IN THE PLANS OR SPECIFICATIONS. THE ENGINEER'S INTERPRETATION OR CORRECTION THEREOF SHALL BE CONCLUSIVE.

C. WHERE THE PLANS OR SPECIFICATIONS DESCRIBE PORTIONS OF THE WORK IN GENERAL TERMS BUT NOT IN COMPLETE DETAIL, IT IS UNDERSTOOD THAT ONLY THE BEST GENERAL PRACTICE IS TO PREVAIL AND THAT ONLY MATERIALS AND WORKMANSHIP OF THE FIRST QUALITY ARE TO BE USED.

D. THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

2. EXISTING UTILITIES AND COORDINATION OF WORK:

A. THE TYPES, LOCATIONS, SIZES AND/OR DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE IMPROVEMENT PLANS WERE OBTAINED FROM SOURCES OF VARYING RELIABILITY. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE TYPES, EXTENT, SIZES, LOCATIONS AND DEPTHS OF SUCH UNDERGROUND UTILITIES. LAUGENOUR AND MEIKLE, HEREINAFTER DESIGNATED AS THE ENGINEER, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF ITS DELINEATION OF SUCH UNDERGROUND UTILITIES, NOR FOR THE EXISTENCE OF OTHER BURIED OBJECTS OR UTILITIES WHICH ARE NOT SHOWN ON THESE DRAWINGS.

B. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE UTILITY COMPANIES INVOLVED AND REQUESTING A VISUAL VERIFICATION OF THE LOCATIONS OF THEIR UNDERGROUND FACILITIES. THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR OF THE SCHEDULED TIME AND PLACE OF SUCH VISUAL VERIFICATION TO ENABLE SAID FIRM TO HAVE A REPRESENTATIVE PRESENT.

C. THE CITY IS A MEMBER OF THE UNDERGROUND SERVICE ALERT (U.S.A.) ONE-CALL PROGRAM. THE CONTRACTOR OR ANY SUBCONTRACTOR FOR THIS CONTRACT SHALL NOTIFY MEMBERS OF U.S.A. 48 HOURS IN ADVANCE OF PERFORMING EXCAVATION WORK BY CALLING THE TOLL-FREE NUMBER 800-642-2444.

3. CONSTRUCTION STAKING:

CONSTRUCTION STAKING SHALL BE FURNISHED BY THE OWNER. THE CONTRACTOR SHALL BE PROVIDED WITH ONE SET OF CONSTRUCTION STAKES FOR EACH PHASE OF THE WORK. THE CONTRACTOR SHALL REQUEST CONSTRUCTION STAKES FOR ANY PARTICULAR PHASE OF WORK AT LEAST 48 HOURS PRIOR TO THE DATE OF THE PLANNED USE OF THE STAKES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STAKES DURING THE CONSTRUCTION OF THE VARIOUS PHASES OF WORK. REPLACEMENT OF STAKES DESTROYED BY CONSTRUCTION SHALL BE AT THE CONTRACTOR'S EXPENSE.

4. FIELD VERIFICATION

WHERE NEW IMPROVEMENTS (CURB, GUTTER, SIDEWALK, PAVEMENT, ASPHALT, UTILITIES, ETC.) ARE DESIGNATED TO MATCH GRADE (±) AT EXISTING IMPROVEMENTS, THE CONTRACTOR'S SURVEYOR SHALL VERIFY THE MATCH POINT GRADES, REPORT ANY DISCREPANCIES AND ADJUST GRADES TO MATCH EXISTING.

5. CONFLICTS:

THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO PERFORMING ANY CORRECTIVE ACTION REQUIRED DUE TO UNFORESEEN CONFLICTS IN THE IMPROVEMENT PLANS OR DUE TO POSSIBLE STAKING ERRORS. THE ENGINEER ASSUMES NO LIABILITY FOR THE COST OR DESIGN OF ANY MODIFICATION PERFORMED WITHOUT SUCH NOTIFICATION, AND ALSO ASSUMES NO LIABILITY FOR STAKING PROVIDED BY OTHERS.

6. CONTROL POINTS AND SURVEY MONUMENTS:

CERTAIN CONTROL POINTS WILL BE SET BY THE ENGINEER, OR ITS REPRESENTATIVE, WHICH ARE CRITICAL TO THE CONSTRUCTION STAKING OF THE PROJECT. THESE POINTS WILL BE DESIGNATED AT A PRE-CONSTRUCTION CONFERENCE BETWEEN REPRESENTATIVES OF THE ENGINEER AND THE CONTRACTOR. THE CONTROL POINTS WILL BE CLEARLY MARKED ON THE JOB SITE. THE CONSTRUCTION SHALL NOT DISTURB THE CONTROL POINTS IN ANY MANNER. IF IT BECOMES NECESSARY TO REMOVE SAID CONTROL POINTS DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER 48 HOURS IN ADVANCE OF SAID REMOVAL TO ALLOW FOR REFERENCING SAID CONTROL POINTS AND THEIR EVENTUAL REPLACEMENT. IF CONTROL POINTS ARE REMOVED OR DESTROYED WITHOUT SAID NOTIFICATION, THE COST OF REPLACEMENT SHALL BE DEDUCTED FROM THE CONTRACTOR'S PAYMENT, AND PAYMENT SHALL BE MADE BY OWNER TO THE ENGINEER.

7. OBSTRUCTIONS:

A. THE CONTRACTOR SHALL REMOVE ALL OBSTRUCTIONS, BOTH ABOVE GROUND AND UNDERGROUND, EXCEPT AS NOTED IN ITEM 2 ABOVE, AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.

B. ALL UNSUITABLE AND SURPLUS MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UNLESS SPECIFIED OTHERWISE.

C. TREE AND STUMP REMOVAL SHALL INCLUDE REMOVAL OF THE MAJOR ROOT SYSTEM TO THE SATISFACTION OF THE CITY ENGINEER. SUCH REMOVAL SHALL BE PERFORMED WITHOUT DAMAGE TO ADJACENT TREES THAT ARE TO BE PRESERVED. STUMP REMOVAL WITHIN THE DRIP LINE OF A TREE TO BE PRESERVED SHALL BE BY GRINDING METHOD, TO A DEPTH OF 0.5 FEET BELOW ADJACENT GRADE.

D. ALL WELLS AND SEPTIC SYSTEMS FOUND ON THE SITE SHALL BE ABANDONED IN ACCORDANCE WITH COUNTY HEALTH DEPARTMENT STANDARDS.

8. PUBLIC SAFETY AND TRAFFIC CONTROL:

A. CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ANY CURRENTLY APPLICABLE SAFETY LAW OF ANY JURISDICTIONAL BODY. THE CONTRACTOR IS DIRECTED TO CONTACT THE STATE INDUSTRIAL RELATIONS DEPARTMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BARRICADES, SAFETY DEVICES, AND CONTROL OF TRAFFIC WITHIN AND AROUND THE CONSTRUCTION AREA. FOR ALL TRENCH EXCAVATIONS 5 FEET OR MORE IN DEPTH, THE CONTRACTOR SHALL OBTAIN A PERMIT FROM THE DIVISION OF INDUSTRIAL SAFETY, PRIOR TO BEGINNING ANY EXCAVATION.

B. PUBLIC SAFETY AND TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH THE CALTRANS TRAFFIC MANUAL (SEE CHAPTER 5: MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE WORK ZONES) SAFE VEHICULAR AND PEDESTRIAN ACCESS SHALL BE PROVIDED AT ALL TIMES DURING CONSTRUCTION.

THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN FOR CITY REVIEW AND APPROVAL PRIOR TO BEGINNING WORK. ALLOW MINIMUM OF 5 WORKING DAYS FOR REVIEW. CHANGEABLE MESSAGE SIGNS (CMS) WILL BE REQUIRED FOR THE PROJECT PER CITY ENGINEERING STANDARDS.

C. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.

9. ENCROACHMENT PERMITS:

UNLESS SPECIFIED OTHERWISE, THE CONTRACTOR SHALL OBTAIN THE NECESSARY ENCROACHMENT PERMITS FROM THE CITY, COUNTY, CALTRANS AND ALL OTHER AGENCIES HAVING JURISDICTION PRIOR TO COMMENCING ANY WORK. THE CONTRACTOR SHALL NOTIFY THE CITY AT LEAST 48 HOURS PRIOR TO THE INTENT TO COMMENCE WORK.

10. STATIONING:

ALL STATIONS REFER TO DISTANCES ALONG STREET CENTER LINE UNLESS INDICATED OTHERWISE.

11. EARTHWORK:

A. ALL EARTHWORK ACTIVITIES, INCLUDING EXCAVATION, GRADING, SCARIFYING, MOISTURIZING, FILL PLACEMENT, COMPACTION, LIME TREATMENT, ETC., SHALL BE PERFORMED IN ACCORDANCE WITH THE C.U.B.C., THE SPECIFICATIONS AND IN CONFORMANCE WITH THE CITY STANDARD SPECIFICATIONS AND WITH THE GRADING PLAN.

B. THE GEOTECHNICAL ENGINEER (SEE INFORMATION SHEET C1) SHALL OBSERVE THE GRADING ACTIVITIES AND PERFORM COMPACTION TESTING FOR THIS PROJECT. THE CONTRACTOR SHALL PROVIDE AT LEAST 24 HOURS NOTICE TO THE GEOTECHNICAL ENGINEER OF THE NEED FOR OBSERVATION AND TESTING SERVICES. THE PROJECT OWNER WILL PAY FOR THE COST OF PROVIDING THESE SERVICES; HOWEVER, IF SAMPLES OF MATERIALS ARE SUBMITTED WHICH FAIL TO PASS THE SPECIFIED TESTS OR IF WORK IS PERFORMED WHICH FAILS TO MEET THESE SPECIFICATIONS, THE CONTRACTOR SHALL PAY FOR ALL SUBSEQUENT RE-TESTS AND RE-INSPECTIONS.

C. EARTHWORK SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO CONSTRUCT THE SITE TO THE GRADES SHOWN. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THE DISPOSAL OF EXCESS EXCAVATED MATERIAL OR FOR THE IMPORT OF MATERIAL.

D. ALL CUT SLOPES SHALL BE ROUNDED AT THE "BREAK" SO THAT THEY BLEND WITH THE NATURAL GROUND CONTOUR.

E. THE CONTRACTOR SHALL APPLY EITHER WATER OR DUST PALLIATIVE, OR BOTH, FOR THE ALLEVIATION OR PREVENTION OF DUST NUISANCE AS DIRECTED BY THE ENGINEER.

F. EXCAVATION AND EMBANKMENT SIDE SLOPES SHOWN ON THE PLANS AS A RATIO, E.G. 4:1, REFER TO THE RATIO OF HORIZONTAL TO VERTICAL DISTANCES. "MINIMUM" SLOPE MEANS "NOT FLATTER THAN", AND "MAXIMUM" SLOPE MEANS "NOT STEEPER THAN". ALL EMBANKMENT AND EXCAVATION SLOPES SHALL BE 4:1 UNLESS NOTED OTHERWISE.

G. TO ACCOMMODATE TRENCH SPOIL, THE CONTRACTOR'S GRADING SHALL INCLUDE UNDERCUTTING OF STREETS AS APPROPRIATE, OR SOME OTHER METHOD APPROVED BY THE ENGINEER.

H. ALL SECTIONS AND DETAILS SHOWN IN THESE PLANS ARE SOLELY INTENDED TO BE REPRESENTATIVE OF THE GRADING AND DRAINAGE DESIGN FOR THE PROJECT. IN NO WAY ARE THEY INTENDED TO REFLECT THE ACTUAL CONSTRUCTION ELEMENTS OF THE FENCING, WALLS, TRASH ENCLOSURE, ETC., UNLESS SPECIFICALLY CALLED OUT AS "CONSTRUCT" OR "PLACE" IN THESE PLANS.

I. ALLOWABLE SUBGRADE GRADING TOLERANCE IS PLUS OR MINUS 0.04' OF THE ELEVATIONS SHOWN HEREON FOR BUILDING PAD, PAVING, OR CONCRETE AREAS. FINAL SURFACE TOLERANCE IS PLUS OR MINUS 0.02'. ADA AREAS SHALL BE IN FULL COMPLIANCE AND SHALL NOT EXCEED MAXIMUM SLOPE REQUIREMENTS.

J. EROSION CONTROL MEASURES SHALL BE IMPLEMENTED DURING PROJECT CONSTRUCTION. COMPLY WITH EROSION AND SEDIMENTATION CONTROL PLAN, BMP AND AGENCY STANDARDS.

K. SUBGRADE PREPARATION FOR ALL PAVEMENT SECTIONS AND FOR CURB AND GUTTER SHALL INCLUDE COMPACTION IN AT LEAST THE TOP 6 INCHES TO AT LEAST 95% RELATIVE COMPACTION AT OR ABOVE OPTIMUM MOISTURE CONTENT, AND TO AT LEAST 90% RELATIVE COMPACTION FOR AT LEAST THE TOP 6 INCHES UNDER THE SIDEWALK OR AS DIRECTED BY GEOTECHNICAL ENGINEER.

L. ALL STREET ELEVATIONS SHOWN ARE FOR TOP FACE OF CURB (TC) UNLESS OTHERWISE SPECIFIED.

M. THE TOP 6 INCHES (MINIMUM) OF ALL LANDSCAPED AREAS SHALL BE CLEAN SOIL.

N. CLEARING, GRUBBING AND PREPARING IMPROVEMENT AREAS:

ALL RUBBLE AND RUBBISH AND OTHER ITEMS ENCOUNTERED DURING SITE WORK AND DEEMED UNACCEPTABLE BY THE GEOTECHNICAL ENGINEER, SHALL BE REMOVED AND DISPOSED OF SO AS TO LEAVE THE DISTURBED AREAS WITH A NEAT AND FINISHED APPEARANCE, FREE FROM UNSIGHTLY DEBRIS. EXCAVATIONS AND DEPRESSIONS RESULTING FROM THE REMOVAL OF SUCH ITEMS, AS WELL AS EXISTING EXCAVATIONS OR LOOSE SOIL DEPOSITS, AS DETERMINED BY THE GEOTECHNICAL ENGINEER, SHALL BE CLEANED OUT TO FIRM, UNDISTURBED SOIL AND BACKFILLED WITH SUITABLE MATERIALS IN ACCORDANCE WITH THESE SPECIFICATIONS.

THE SURFACES RECEIVING FILL SHALL BE STRIPPED OF VEGETATION OR THEY SHALL BE THOROUGHLY DISCED PROVIDED THAT A COMPACTABLE MIXTURE OF SOIL CONTAINING MINOR AMOUNTS OF VEGETATION CAN BE ATTAINED WHICH IS FREE OF CLUMPS, LAYERS OR POCKETS OF VEGETATION. IF PROPER COMPACTION OF THE DISTURBED SURFACE SOILS CANNOT BE ACHIEVED, THOSE MATERIALS SHALL BE EXCAVATED, TO A DEPTH SATISFACTORY TO THE GEOTECHNICAL ENGINEER, SO THAT A FIRM BASE FOR SUPPORT OF ENGINEERED FILL CAN BE ATTAINED.

ALL LOOSE AND/OR SATURATED MATERIALS SHALL BE OVER-EXCAVATED TO FIRM SOIL, AS DETERMINED BY THE GEOTECHNICAL ENGINEER, AND THE RESULTING EXCAVATIONS SHALL BE BACKFILLED WITH SUITABLE MATERIALS IN ACCORDANCE WITH THESE SPECIFICATIONS.

THE SURFACES UPON WHICH FILL IS TO BE PLACED SHALL BE PLOWED OR SCARIFIED TO A DEPTH OF AT LEAST 8 INCHES, UNTIL THE SURFACE IS FREE FROM RUTS, MOUNDS OR OTHER UNEVEN FEATURES WHICH WOULD TEND TO PREVENT UNIFORM COM-PACTION BY THE SELECTED EQUIPMENT.

WHEN THE MOISTURE CONTENT OF THE SUBGRADE IS LESS THAN TWO PERCENT OVER OPTIMUM, AS DEFINED BY THE ASTM D1557-91 COMPACTION TEST, WATER SHALL BE ADDED UNTIL THE PROPER MOISTURE CONTENT IS ACHIEVED. WHEN THE MOISTURE CONTENT OF THE SUBGRADE IS TOO HIGH TO PERMIT THE SPECIFIED COMPACTION TO BE ACHIEVED, THE SUBGRADE SHALL BE AERATED BY BLADING OR OTHER METHODS UNTIL THE MOISTURE CONTENT IS SATISFACTORY FOR COMPACTION.

AFTER THE FOUNDATIONS FOR FILL HAVE BEEN CLEARED, MOISTURE CONDITIONED, AND PLOWED OR SCARIFIED, THEY SHALL BE RECOMPACTED IN PLACE TO A DEPTH OF AT LEAST 8 INCHES TO A MINIMUM OF 90 PERCENT OF THE ASTM D1557-91 MAXIMUM DRY DENSITY.

O. CONSTRUCTION OF UNTREATED SUBGRADES:

THE SELECTED SOIL FILL MATERIAL SHALL BE PLACED IN LAYERS WHICH, WHEN COMPACTED, DO NOT EXCEED 6 INCHES IN THICKNESS. EACH LAYER SHALL BE SPREAD EVENLY AND SHALL BE THOROUGHLY MIXED DURING THE SPREADING TO PROMOTE UNIFORMITY OF MATERIAL IN EACH LAYER.

WHEN THE MOISTURE CONTENT OF THE FILL MATERIAL IS LESS THAN TWO PERCENT OVER OPTIMUM MOISTURE, AS DEFINED BY THE ASTM D1557-91 COMPACTION TEST, WATER SHALL BE ADDED UNTIL THE PROPER MOISTURE CONTENT IS ACHIEVED.

WHEN THE MOISTURE CONTENT OF THE FILL MATERIAL IS TOO HIGH TO PERMIT THE SPECIFIED DEGREE OF COMPACTION TO BE ACHIEVED, THE FILL MATERIAL SHALL BE AERATED BY BLADING OR OTHER METHODS UNTIL THE MOISTURE CONTENT IS SATISFACTORY.

AFTER EACH LAYER HAS BEEN PLACED, MIXED AND SPREAD EVENLY, IT SHALL BE THOROUGHLY COMPACTED TO NOT LESS THAN 90 PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED BY THE ASTM D1557-91 COMPACTION TEST. COMPACTION SHALL BE UNDERTAKEN WITH EQUIPMENT CAPABLE OF ACHIEVING THE SPECIFIED DENSITY AND SHALL BE ACCOMPLISHED WHILE THE FILL MATERIAL IS AT THE REQUIRED MOISTURE CONTENT. EACH LAYER SHALL BE COMPACTED OVER ITS ENTIRE AREA UNTIL THE DESIRED DENSITY HAS BEEN OBTAINED.

THE FILL OPERATIONS SHALL BE CONTINUED UNTIL THE FILLS HAVE BEEN BROUGHT TO THE SLOPES AND GRADES SHOWN ON THE DRAWINGS.

THE UPPER 6 INCHES OF ANY UNTREATED FINAL SUBGRADES SHALL BE UNIFORMLY COMPACTED TO AT LEAST 95 PERCENT OF THE ASTM D1557-91 MAXIMUM DRY DENSITY REGARDLESS OF WHETHER FINAL SUBGRADE ELEVATION IS ATTAINED BY FILLING, EXCAVATION OR LEFT AT EXISTING GRADE.

12. CONCRETE CONSTRUCTION:

A. AS SOON AS THE SURFACE OF THE GUTTER HAS SET SUFFICIENTLY TO PERMIT THE INTRODUCTION OF A SHALLOW STREAM OF WATER WITHOUT CAUSING DAMAGE TO THE GUTTER SURFACE, SAME SHALL BE APPLIED AND ALL FLOWLINE IRREGULARITIES SHALL BE CORRECTED BEFORE THE CONCRETE SURFACE HAS TAKEN INITIAL SET.

B. CONCRETE CONSTRUCTION SHALL COMPLY WITH CALTRANS STANDARD SPECIFICATION SECTIONS 73 AND 90.

C. HANDICAPPED RAMP CONSTRUCTION SHALL COMPLY WITH ALL STATE AND FEDERAL BUILDING CODES.

D. BUILDING PERIMETER CURB: BACK OF CURB IS TYPICAL LIMIT OF SITE CONCRETE WORK. VERIFY TYPE AND LOCATION OF CURB DEPRESSIONS (FOR RAMPS, ETC.) AND CURB GRADES WITH ARCHITECT PRIOR TO FORMING.

13. PIPELINES:

A. ANY EXISTING UTILITY, WHICH IS TO BE EXTENDED, WHICH IS THE CONNECTION POINT FOR NEW UNDERGROUND UTILITIES, OR WHICH NEW FACILITIES CROSS, SHALL BE EXPOSED BY THE CONTRACTOR PRIOR TO PLACEMENT OF THE NEW UTILITIES. COST OF SUCH EXCAVATION AND SUBSEQUENT BACKFILL SHALL BE INCLUDED IN THE PRICES PAID FOR THE VARIOUS ITEMS OF WORK. THE ELEVATIONS AND LOCATIONS OF THE EXISTING FACILITIES WILL BE CHECKED BY THE PUBLIC WORKS INSPECTOR AND THE ENGINEER. IF IN THE OPINION OF THE INSPECTOR A CONFLICT EXISTS, THEN THE ENGINEER SHALL MAKE ANY NEEDED GRADE AND/OR ALIGNMENT ADJUSTMENTS AND REVISE THE PLANS ACCORDINGLY. ALL GRAVITY FLOW PIPELINES TO BE LAID UPGRADE FROM THE LOWEST POINT STARTING AT THE END OF EXISTING IMPROVEMENTS.

B. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 24 HOURS PRIOR TO BACKFILLING OF ANY PIPE WHICH STUBS TO A FUTURE PHASE OF CONSTRUCTION FOR INVERT VERIFICATION. TOLERANCE SHALL BE IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS.

14. ADJUSTING MANHOLES, VALVE AND MONUMENT BOXES:

THE CONTRACTOR SHALL ADJUST AND/OR RECONSTRUCT TO GRADE ALL EXISTING UTILITY STRUCTURES, INCLUDING MANHOLES AND VALVE BOXES AND MONUMENT BOXES, WITHIN THE WORK AREA UNLESS NOTED OTHERWISE.

15. STORM DRAIN SYSTEM:

A. THE CONTRACTOR SHALL MAINTAIN ALL EXISTING DRAINAGE FACILITIES WITHIN THE CONSTRUCTION AREA UNTIL THE DRAINAGE IMPROVEMENTS ARE IN PLACE AND FUNCTIONING AND ACCEPTED BY THE AGENCY AND THE ENGINEER. PROTECT EXISTING DRAIN INLET AND STORM DRAIN SYSTEM PER SE-10 OF THE CALIFORNIA STORMWATER BMP HANDBOOK.

B. DRAIN PIPE MATERIAL SHALL BE REINFORCED CONCRETE PIPE, C-76 CL III PER CITY STANDARDS.

C. TRENCH EXCAVATION, BEDDING AND BACKFILL WITHIN PUBLIC RIGHTS-OF-WAY OR EASEMENTS SHALL COMPLY WITH CITY STANDARDS.

D. INSTALL WEAK CONCRETE PLUG AT ALL STORM DRAIN STUBS.

16. PRESERVATION OF PROPERTY:

TREES AND SHRUBBERY THAT ARE NOT TO BE REMOVED, AND POLE LINES, FENCES, SIGNS, SURVEY MARKERS AND MONUMENTS, BUILDINGS AND STRUCTURES, CONDUITS, PIPELINES, ALL STREET FACILITIES, AND ANY OTHER IMPROVEMENTS OR FACILITIES WITHIN OR ADJACENT TO THE STREET OR CONSTRUCTION AREA SHALL BE PROTECTED FROM INJURY OR DAMAGE, AND UPON ORDER BY THE CITY ENGINEER, THE CONTRACTOR SHALL PROVIDE AND INSTALL SAFE-GUARDS APPROVED BY THE CITY ENGINEER TO PROTECT SUCH OBJECTS FROM INJURY OR DAMAGE. IF SUCH OBJECTS ARE INJURED OR DAMAGED BY REASON OF THE CONTRACTOR'S OPERATIONS, THEY SHALL BE REPLACED OR RESTORED AT THE CONTRACTOR'S EXPENSE. THE FACILITIES SHALL BE REPLACED OR RESTORED TO A CONDITION AS GOOD AS WHEN THE CONTRACTOR ENTERED UPON THE WORK, OR AS GOOD AS REQUIRED BY THE SPECIFICATION ACCOMPANYING THE CONTRACT, IF ANY SUCH OBJECTS ARE A PART OF THE WORK BEING PERFORMED UNDER CONTRACT. THE CITY ENGINEER MAY MAKE OR CAUSE TO BE MADE SUCH TEMPORARY REPAIRS AS ARE NECESSARY TO RESTORE TO SERVICE ANY DAMAGED FACILITY. THE COST OF SUCH REPAIRS SHALL BE BORNE BY THE CONTRACTOR.

LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING
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REGISTERED PROFESSIONAL ENGINEER · BRYANT P. BONINO · No. 41804 · CIVIL · STATE OF CALIFORNIA

PROJECT ENGINEER'S SIGNATURE

BY: _____

BRYAN P. BONINO

DATE: 01/04/2024 P.E. 41804

#464-81

PUBLIC IMPROVEMENTS FOR YOLO COUNTY AG DEPARTMENT SHOPS BUILDING

120 W. MAIN STREET
WOODLAND, CA

BENCH MARK:
ELEVATION: 65.39 DATUM: NAVD88
DESCRIPTION: FD. 2-1/2" BRASS DISK IN MON. WELL STAMPED "YOLO COUNTY GPS SUBSIDENCE NETWORK LIBRARY 1999" 42' ± NE OF INTERSECTION OF COURT ST. & COLLEGE ST.

CITY OF WOODLAND
APPROVED BY:

_____
BRENT MEYER - CITY ENGINEER

DATE: _____

SCALE:
HORIZ. NONE VERT. NONE

DATE: 01/04/2024

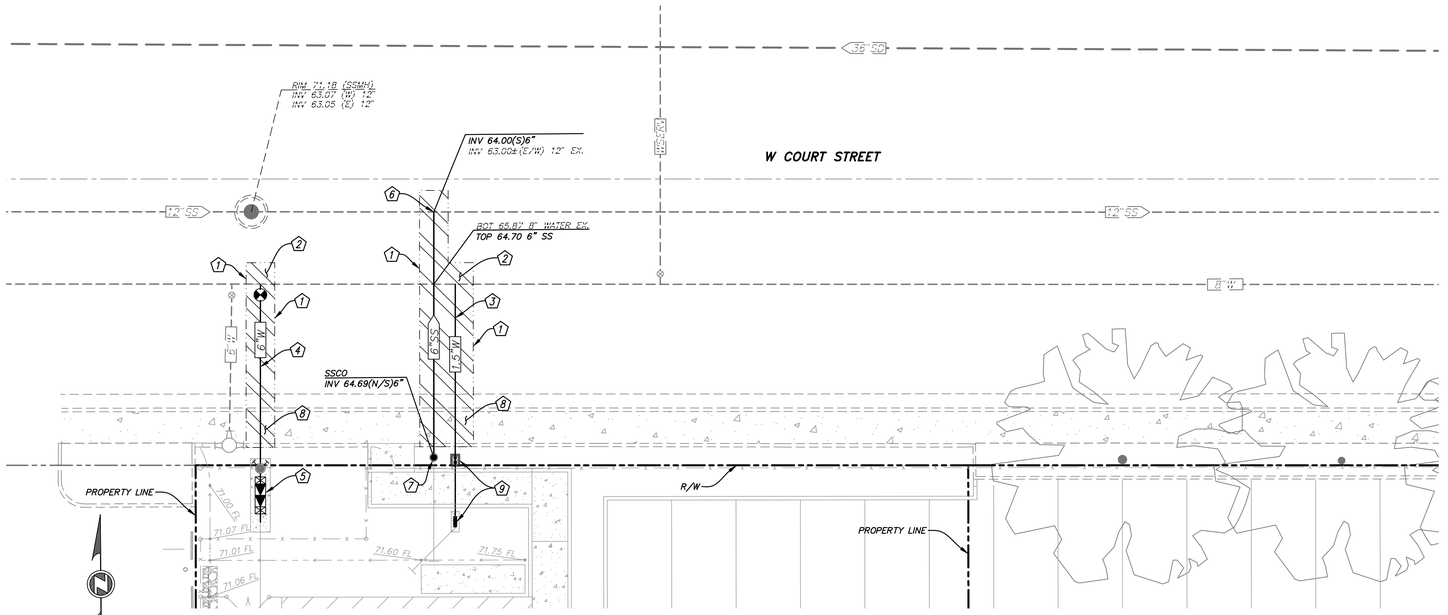
DESIGNED BY B. BONINO
DRAWN BY P. JAUREGUI
REVIEWED BY P. CHOATE
FILE: 464-81_F002.dwg

REVISIONS

NO.	DESCRIPTION	BY APPR.	DATE

ABBREVIATIONS & GENERAL NOTES

SHEET 2 OF 4



1 WEST COURT STREET PLAN VIEW
1"=10'

GENERAL NOTES:

A. CONTRACTOR SHALL POTHOLE AND VERIFY DEPTHS AND LOCATIONS OF EXISTING UTILITIES ALONG THE PROPOSED UTILITY ALIGNMENTS AS FIRST ITEM OF WORK, AND NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.

B. ALL UNSUITABLE AND SURPLUS MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UNLESS SPECIFIED OTHERWISE. VERIFY WITH OWNER POTENTIAL ONSITE DISPOSAL AREAS.

C. PROTECT DRAINAGE SYSTEM WITH STORM WATER BMP's PER CASQA CALIFORNIA STORMWATER BMP HANDBOOK FOR CONSTRUCTION ACTIVITIES.

D. INSTALL THRUST BLOCKS OR RESTRAINED JOINTS AT ALL WATER FITTINGS PER CITY OF WOODLAND STANDARD DETAILS 0750, 0753, 0754 AND 0755. (∀ – TYPICAL).

CONSTRUCTION NOTES:

1. PAVEMENT REMOVAL LINE, SAWCUT (— · — · — · — · — · — · —).
2. HATCHING DENOTES EXISTING AC AND AB SECTION TO BE REMOVED AND REPLACED WITH SECTION MATCHING EXISTING STREET SECTION OR 6"AC OVER 12" AB, WHICHEVER IS GREATER. SEE CITY DETAIL 214.
3. INSTALL 1.5" LATERAL (TAP BY CITY AT CONTRACTOR'S EXPENSE) FROM EXISTING 8" WATER MAIN PER CITY DETAILS 700, 710, AND 712 WITH ADAPTERS AS REQUIRED FOR INSTALLATION OF 1.5" METER.
4. INSTALL 6" WATER MAIN (TAP BY CITY AT CONTRACTOR'S EXPENSE) FROM EXISTING 8" WATER MAIN PER CITY DETAIL 720 AND 6" WATER VALVE PER CITY DETAIL 725. CONTRACTOR TO COORDINATE CONNECTION TO EXISTING WATER MAIN WITH CITY OF WOODLAND PUBLIC WORKS DEPARTMENT. CONTRACTOR SHALL PROVIDE 10 DAY MINIMUM ADVANCED NOTICE FOR CONNECTION. CONTRACTOR TO FURNISH ALL CONNECTION MATERIALS, THRUST BLOCKS, VALVES, AND REQUIRED FITTINGS AND PERFORM ALL NECESSARY PAVEMENT REMOVAL AND REPLACEMENT, EXCAVATION AND BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL MATERIALS AND LABOR NECESSARY TO COMPLETE THIS TASK.
5. INSTALL 6" DOUBLE CHECK DETECTOR BACKFLOW ASSEMBLY WITH FIRE DEPARTMENT CONNECTION PER CITY OF WOODLAND STANDARD DETAIL 762. BACKFLOW PREVENTER SHALL BE ON STATE APPROVED LIST. BACKFLOW PREVENTION DEVICES MUST BE TESTED BY CITY–APPROVED TESTER AND TEST RESULTS PROVIDED TO PUBLIC INFRASTRUCTURE INSPECTOR PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY. THE CONTRACTOR IS RESPONSIBLE FOR ALL MATERIALS AND LABOR NECESSARY TO COMPLETE THIS TASK.
6. INSTALL 6" SANITARY SEWER LATERAL PER CITY OF WOODLAND STANDARD DETAIL 500 WITH SEWER TAP PER CITY OF WOODLAND STANDARD DETAIL 522. CONTRACTOR SHALL PROVIDE 10 DAY MINIMUM ADVANCED NOTICE FOR CONNECTION. CONTRACTOR TO FURNISH ALL CONNECTION MATERIALS, AND REQUIRED FITTINGS AND PERFORM ALL NECESSARY PAVEMENT REMOVAL AND REPLACEMENT, EXCAVATION AND BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL MATERIALS AND LABOR NECESSARY TO COMPLETE THIS TASK.
7. INSTALL SANITARY SEWER CLEAN OUT PER CITY OF WOODLAND STANDARD DETAIL 510 OR 512.
8. REMOVE EXISTING CURB, GUTTER AND SIDEWALK AS REQUIRED FOR INSTALLATION OF NEW IMPROVEMENTS, AND REPLACE IN KIND PER CITY OF WOODLAND STANDARD DETAIL 310. EXTENTS OF CONCRETE REMOVAL AND REPLACEMENT SHALL BE AS MARKED IN FIELD BY INSPECTOR.
9. INSTALL 1.5" METER PER CITY DETAIL 705 ALONG WITH 1.5" BACKFLOW PREVENTER ASSEMBLY PER CITY DETAIL 761 WITH 1.5" SERVICE LINE AFTER BACKFLOW FOR DOMESTIC WATER SERVICE CONNECTION. BACKFLOW PREVENTER SHALL BE ON STATE APPROVED LIST. BACKFLOW PREVENTION DEVICES MUST BE TESTED BY CITY–APPROVED TESTER AND TEST RESULTS PROVIDED TO PUBLIC INFRASTRUCTURE INSPECTOR PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY. THE CONTRACTOR IS RESPONSIBLE FOR ALL MATERIALS AND LABOR NECESSARY TO COMPLETE THIS TASK.

LM LAUGENOUR AND MEIKLE
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P.O. BOX 828, WOODLAND, CALIFORNIA 95776 · FAX: (530) 662-4602

REGISTERED PROFESSIONAL ENGINEER · BRYAN P. BONINO · No. 41804 · CIVIL · STATE OF CALIFORNIA

PROJECT ENGINEER'S SIGNATURE
BY: Bryan P. Bonino
BRYAN P. BONINO
DATE: 01/04/2024 P.E. 41804

#464-81

PUBLIC IMPROVEMENTS FOR YOLO COUNTY AG DEPARTMENT SHOPS BUILDING

120 W. MAIN STREET
WOODLAND, CA

BENCH MARK:
ELEVATION: 65.39 DATUM: NAVD88
DESCRIPTION: FD. 2–1/2" BRASS DISK IN MON. WELL STAMPED "YOLO COUNTY GPS SUBSIDENCE NETWORK LIBRARY 1999" 42' ± NE OF INTERSECTION OF COURT ST. & COLLEGE ST.

CITY OF WOODLAND
APPROVED BY:
BRENT MEYER – CITY ENGINEER
DATE:

SCALE:
HORIZ. 1"=10' VERT. N/A
DATE: 01/04/2024

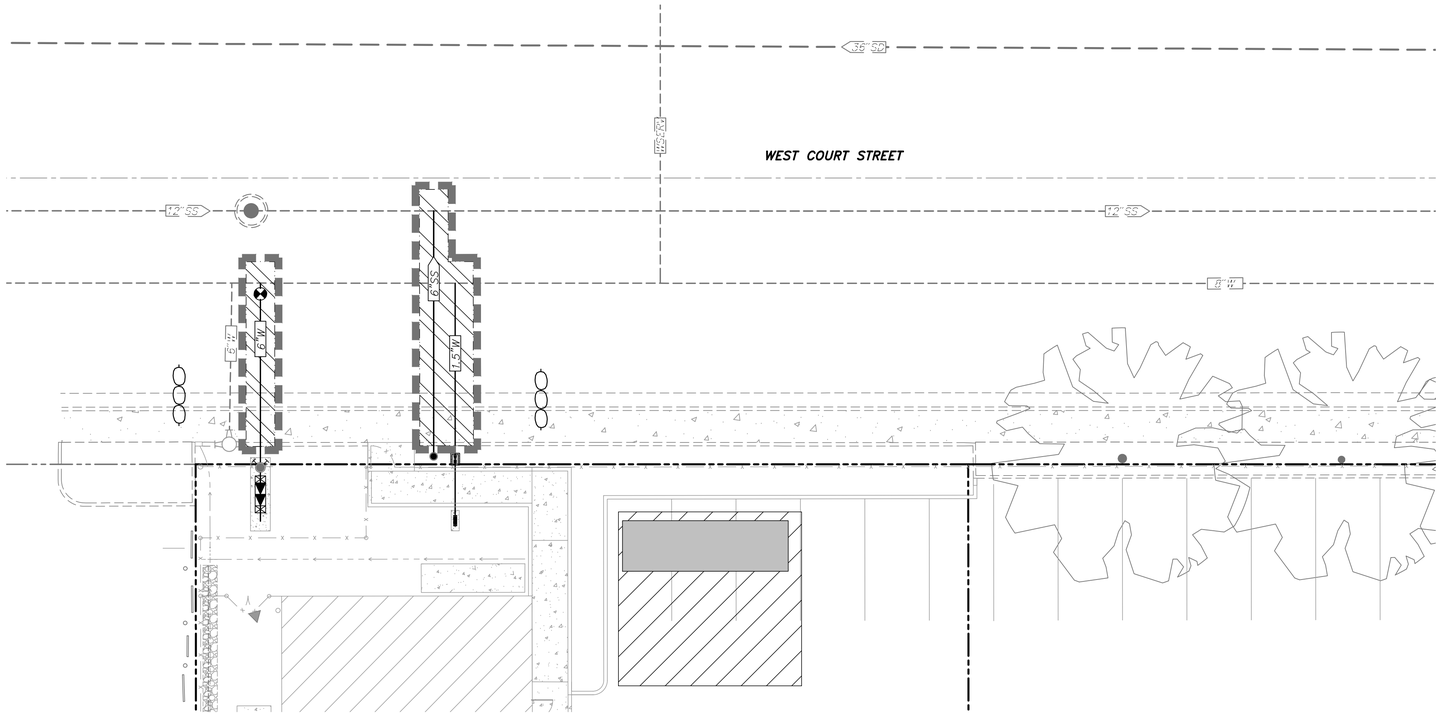
DESIGNED BY B. BONINO
DRAWN BY P. JAUREGUI
REVIEWED BY P. CHOATE
FILE: 464–81_F003.dwg

REVISIONS

NO.	DESCRIPTION	BY / APPR.	DATE / DATE

UTILITIES PLAN

SHEET 3 OF 4



0 5 10 20
SCALE: 1"=10'

LEGEND:

- STORM DRAIN INLET PROTECTION PER CASQA SE-10 INLET FILTER PER CITY DETAIL 11-7
- LIMIT OF CLEARING AND GRADING
- DRAINAGE FLOW
- CONCRETE WASHOUT PIT MATERIAL PER CASQA WM-8 WITH POSTED SIGNS
- GRAVEL BAG BERM PER CASQA SE-6
- PLANNED STAGING, MATERIAL AND WASTE STORAGE AREA AND SOLID WASTE STORAGE AREA PER CASQA WM-1 TO WM-5

EROSION CONTROL NOTES:

1. ALL WORK SHALL CONFORM TO THE CURRENT CITY OF WOODLAND STANDARD SPECIFICATIONS AND ALL APPLICABLE ADDENDA.
2. CONTRACTOR MUST ENSURE THAT THE CONSTRUCTION SITE IS PREPARED PRIOR TO THE ONSET OF ANY STORM. CONTRACTOR SHALL HAVE ALL EROSION AND SEDIMENT CONTROL MEASURES IN PLACE PRIOR TO ANY DEMOLITION OR CONSTRUCTION ACTIVITIES.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL DISTURBED AREAS ARE STABILIZED. CHANGES TO THIS EROSION AND SEDIMENT CONTROL PLAN SHALL BE MADE TO MEET FIELD CONDITIONS ONLY WITH THE APPROVAL OF OR AT THE DIRECTION OF A REPRESENTATIVE OF THE DEPARTMENT OF UTILITIES.
4. THIS PLAN MAY NOT COVER ALL THE SITUATIONS THAT ARISE DURING CONSTRUCTION DUE TO UNANTICIPATED FIELD CONDITIONS. VARIATIONS MAY BE MADE TO THE PLAN IN THE FIELD SUBJECT TO THE APPROVAL OF OR AT THE DIRECTION OF A REPRESENTATIVE OF THE DEPARTMENT OF UTILITIES.
5. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED BEFORE AND AFTER ALL STORMS TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
6. CONTRACTOR SHALL MAINTAIN A LOG AT THE SITE OF ALL INSPECTIONS OR MAINTENANCE OF BMP'S, AS WELL AS, ANY CORRECTIVE CHANGES TO THE BMP'S OR EROSION AND SEDIMENT CONTROL PLAN.
7. IN AREAS WHERE SOIL IS EXPOSED, PROMPT REPLANTING WITH NATIVE COMPATIBLE, DROUGHT-RESISTANT VEGETATION SHALL BE PERFORMED. NO AREAS WILL BE LEFT EXPOSED OVER THE WINTER SEASON.
8. THE CONTRACTOR SHALL INSTALL THE STABILIZED CONSTRUCTION ENTRANCE PRIOR TO COMMENCEMENT OF GRADING. LOCATION OF THE ENTRANCE MAY BE ADJUSTED BY THE CONTRACTOR TO FACILITATE GRADING OPERATIONS. ALL CONSTRUCTION TRAFFIC ENTERING THE PAVED ROAD MUST CROSS THE STABILIZED CONSTRUCTION ENTRANCE. THE STABILIZED CONSTRUCTION ENTRANCE SHALL REMAIN IN PLACE UNTIL THE ROAD BASE ROCK COURSE IS COMPLETED.
9. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE SWEPT AT THE END OF EACH WORKING DAY OR AS NECESSARY.
10. CONTRACTOR SHALL PLACE INLET FILTER BAGS AROUND ALL DOWNSTREAM EXISTING DRAIN INLETS ON THE STREET, AND ALL NEW DRAINAGE STRUCTURE OPENINGS IMMEDIATELY AFTER THE STRUCTURE OPENING IS CONSTRUCTED. THESE INLET FILTER BAGS SHALL BE MAINTAINED AND REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED.
11. CONTRACTOR SHALL PLACE STRAW WATTLE ALONG THE PERIMETER OF PROJECT SITE.
12. CONTRACTOR SHALL IMPLEMENT HOUSEKEEPING PRACTICES AS FOLLOWS:

A. SOLID WASTE MANAGEMENT:
PROVIDE DESIGNATED WASTE COLLECTION AREAS AND CONTAINERS. ARRANGE FOR REGULAR REMOVAL AND DISPOSAL. CLEAR SITE OF TRASH INCLUDING ORGANIC DEBRIS, PACKAGING MATERIALS, SCRAP OR SURPLUS BUILDING MATERIALS AND DOMESTIC WASTE DAILY.

B. MATERIAL DELIVERY AND STORAGE:
PROVIDE A DESIGNATED MATERIAL STORAGE AREA WITH SECONDARY CONTAINMENT SUCH AS BERMING. STORE MATERIAL ON PALLETS AND PROVIDE COVERING FOR SOLUBLE MATERIALS. RELOCATE STORAGE AREA INTO BUILDING SHELL WHEN POSSIBLE. INSPECT AREA WEEKLY.

C. CONCRETE WASTE:
PROVIDE A DESIGNATED AREA FOR A TEMPORARY PIT TO BE USED FOR CONCRETE TRUCK WASH-OUT. DISPOSE OF HARDENED CONCRETE OFFSITE. AT NO TIME SHALL A CONCRETE TRUCK DUMP ITS WASTE AND CLEAN ITS TRUCK INTO THE CITY STORM DRAINS VIA CURB AND GUTTER. INSPECT DAILY TO CONTROL RUNOFF, AND WEEKLY FOR REMOVAL OF HARDENED CONCRETE.

D. PAINT AND PAINTING SUPPLIES:
PROVIDE INSTRUCTION TO EMPLOYEES AND SUBCONTRACTORS REGARDING REDUCTION OF POLLUTANTS INCLUDING MATERIAL STORAGE, USE, AND CLEAN UP. INSPECT SITE WEEKLY FOR EVIDENCE OF IMPROPER DISPOSAL.

E. VEHICLE FUELING, MAINTENANCE AND CLEANING:
PROVIDE A DESIGNATED FUELING AREA WITH SECONDARY CONTAINMENT SUCH AS BERMING. DO NOT ALLOW MOBILE FUELING OF EQUIPMENT. PROVIDE EQUIPMENT WITH DRIP PANS. RESTRICT ONSITE MAINTENANCE AND CLEANING OF EQUIPMENT TO A MINIMUM. INSPECT AREA WEEKLY.

F. HAZARDOUS WASTE MANAGEMENT:
PREVENT THE DISCHARGE OF POLLUTANTS FROM HAZARDOUS WASTES TO THE DRAINAGE SYSTEM THROUGH PROPER MATERIAL USE, WASTE DISPOSAL AND TRAINING OF EMPLOYEES. HAZARDOUS WASTE PRODUCTS COMMONLY FOUND ON-SITE INCLUDE BUT ARE NOT LIMITED TO PAINTS & SOLVENTS, PETROLEUM PRODUCTS, FERTILIZERS, HERBICIDES & PESTICIDES, SOIL STABILIZATION PRODUCTS, ASPHALT PRODUCTS AND CONCRETE CURING PRODUCTS.

WDID #:

TOTAL DISTURBED AREA: 337 SF

SITE BMP's

CASQA FACT SHEET	BMP NAME	REQUIRED
EC-1	SCHEDULING	✓
EC-2	PRESERVATION OF EXISTING VEGETATION	✓
EC-3	HYDRAULIC MULCH	
EC-4	HYDROSEEDING	
EC-5	SOIL BINDERS	
EC-6	STRAW MULCH	
EC-7	GEOTEXTILES AND MATS	
EC-8	WOOD MULCHING	
EC-9	EARTH DIKES AND DRAINAGE SWALES	
EC-10	VELOCITY DISSIPATION DEVICES	
EC-11	SLOPE DRAINS	
EC-12	STREAMBANK STABILIZATION	
EC-14	COMPOST BLANKET	
EC-15	SOIL PREPARATION/ROUGHENING	
EC-16	NON-VEGETATIVE STABILIZATION	✓
WE-1	WIND EROSION CONTROL	✓
SE-1	SILT FENCE	
SE-2	SEDIMENT BASIN	
SE-3	SEDIMENT TRAP	
SE-4	CHECK DAMS	
SE-5	FIBER ROLLS	
SE-6	GRAVEL BAG BERM	✓
SE-7	STREET SWEEPING AND VACUUMING	✓
SE-8	SANDBAG BARRIER	
SE-9	STRAW BALE BARRIER	
SE-10	STORM DRAIN INLET PROTECTION	✓
SE-11	ACTIVE TREATMENT SYSTEM (ATS)	
SE-12	TEMPORARY SILT DIKE	
SE-13	COMPOST SOCKS AND BERMS	
SE-14	BIOFILTER BAGS	
TC-1	STABILIZED CONSTRUCTION ENTRANCE/EXIT	
TC-2	STABILIZED CONSTRUCTION ROADWAY	
TC-3	ENTRANCE/OUTLET TIRE WASH	
NS-1	WATER CONSERVATION PRACTICES	✓
NS-2	DEWATERING OPERATIONS	
NS-3	PAVING AND GRINDING OPERATIONS	✓
NS-4	TEMPORARY STREAM CROSSING	
NS-5	CLEAR WATER DIVERSION	
NS-6	ILLICIT CONNECTION/DISCHARGE	✓
NS-7	POTABLE WATER/IRRIGATION	
NS-8	VEHICLE AND EQUIPMENT CLEANING	✓
NS-9	VEHICLE AND EQUIPMENT FUELING	✓
NS-10	VEHICLE & EQUIPMENT MAINTENANCE	
NS-11	PILE DRIVING OPERATIONS	
NS-12	CONCRETE CURING	✓
NS-13	CONCRETE FINISHING	✓
NS-14	MATERIAL OVER WATER	
NS-15	DEMOLITION ADJACENT TO WATER	
NS-16	TEMPORARY BATCH PLANTS	
WM-1	MATERIAL DELIVERY AND STORAGE	✓
WM-2	MATERIAL USE	✓
WM-3	STOCKPILE MANAGEMENT	✓
WM-4	SPILL PREVENTION AND CONTROL	✓
WM-5	SOLID WASTE MANAGEMENT	✓
WM-6	HAZARDOUS WASTE MANAGEMENT	✓
WM-7	CONTAMINATED SOIL MANAGEMENT	
WM-8	CONCRETE WASTE MANAGEMENT	✓
WM-9	SANITARY/SEPTIC WASTE MANAGEMENT	✓
WM-10	LIQUID WASTE MANAGEMENT	

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REGISTERED PROFESSIONAL ENGINEER · BRYAN P. BONINO · No. 41804 · CIVIL · STATE OF CALIFORNIA

PROJECT ENGINEER'S SIGNATURE
BY: Bryan P. Bonino
BRYAN P. BONINO
DATE: 01/04/2024 P.E. 41804

#464-81

PUBLIC IMPROVEMENTS FOR YOLO COUNTY AG DEPARTMENT SHOPS BUILDING

120 W. MAIN STREET
WOODLAND, CA

BENCH MARK:
ELEVATION: 65.39 DATUM: NAVD88
DESCRIPTION: FD. 2-1/2" BRASS DISK IN MON. WELL STAMPED "YOLO COUNTY GPS SUBSIDENCE NETWORK LIBRARY 1999" 42' ± NE OF INTERSECTION OF COURT ST. & COLLEGE ST.

CITY OF WOODLAND
APPROVED BY:
BRENT MEYER – CITY ENGINEER
DATE:

SCALE:
HORIZ. 1"=10' VERT. N/A
DATE: 01/04/2024

DESIGNED BY B. BONINO
DRAWN BY P. JAUREGUI
REVIEWED BY P. CHOATE
FILE: 464-81_F004.dwg

REVISIONS

NO.	DESCRIPTION	BY APPR.	DATE

EROSION CONTROL & SEDIMENTATION PLAN

SHEET 4 OF 4

LAUGENOUR AND MEIKLE
CIVIL ENGINEERING · LAND SURVEYING · PLANNING

JOB	Yolo Ag Shop (#464-81)		
SHEET NO.	1	OF	7
CALCULATED BY	NUB	DATE	01/08/2024
CHECKED BY		DATE	

STORMWATER QUALITY/DRAINAGE SUMMARY

PURPOSE: Summarize the attached post-construction stormwater quality and drainage design calculations for the building-permit application, including the associated improvement plans, for the Yolo Ag Shop, on 139 West Court Street in Woodland, CA.

SUMMARY:

Stormwater Control Plan
The Stormwater Control Plan is shown on Sheet C501 of the improvement plans. The main BMP will be an infiltration trench, BMP 1. It will be used for stormwater quality treatment. The Stormwater Control Plan shows the proposed post-construction stormwater quality control measures, and Sheet C501 shows associated details. Reduced-size versions of these sheets and exhibits showing the existing and proposed DMAs and are included in **Appendix A, Stormwater Control Plan and Exhibits**.

Post-Construction Worksheets
The Stormwater Control Plan is summarized using the city's Post-Construction Worksheet (Appendix 8 from the city's Post-Construction Standards Plan, 2015), included in **Appendix B, Post-Construction Worksheets**.

Treatment Runoff Volume
Treatment control measure calculations were made for the site using the city's treatment sizing spreadsheet (Appendix 6 from the city's Post-Construction Standards Plan, 2015), included in **Appendix C, Treatment Runoff Volume Calculations**.

Hydromodification Runoff Volume
Total project size is less than 1 acre, so Hydromodification is not required.

Maximum Runoff Volume
The calculations of the maximum runoff volume that must be accommodated by the infiltration trench (BMP 1) are discussed above for stormwater quality treatment. The results are summarized in **Appendix D, Runoff Volume Summary.** The maximum runoff volume is equal to the treatment volume because the project is not required to meet hydromodification requirements.

Required BMP Volume
The infiltration trench (BMP 1) was sized to accommodate the maximum runoff volume, discussed above, so that no overflows would occur from the infiltration trench for the maximum runoff volume. The sizing calculations are as shown in the table in **Appendix E, Required BMP Volume Calculations,** using methods as footnoted in the table**.** The sizing calculations account the infiltration rate of the native soil under the trench. A design infiltration rate of 1 in./hr. was used based on the USDA Custom Soil Report for Yolo County, California.

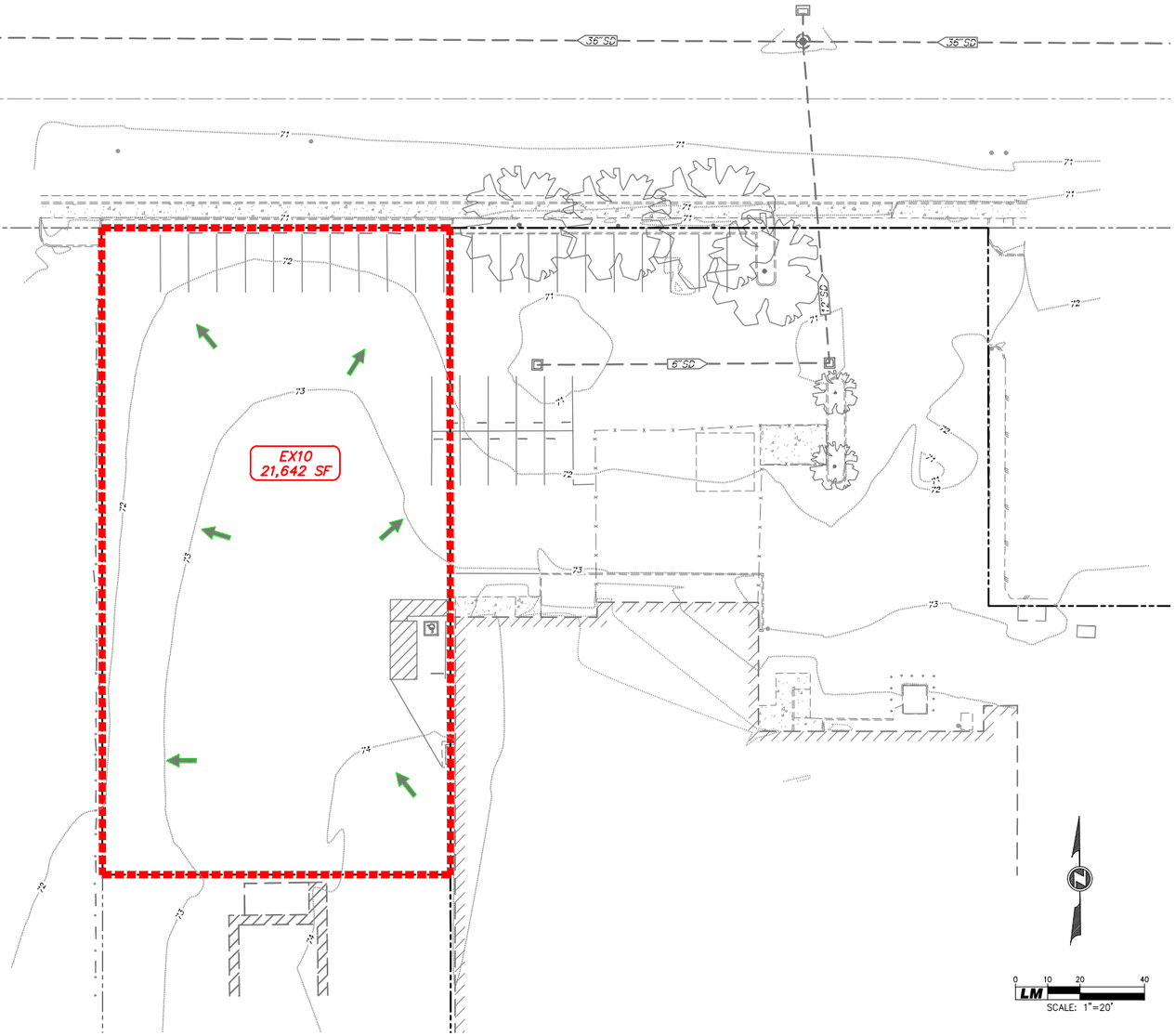
BMP Volume Provided
The calculations of the volume provided by BMP 1 are summarized in **Appendix F, Volume Provided by the BMP.** The resulting volumes provided are summarized in **Appendix D, Runoff Volume Summary,** where they are compared to the required volumes. The storage volume includes the empty volume of the pipe and the pore-space volume of the rock in the trench.

Overland Release
For an event larger than the 10 year storm, the West area releases overland either through the driveways or the curb cuts along West Court Street. When runoff reaches the city streets, it is conveyed through gutters and valley gutters to the city pipe system.

STORMWATER QUALITY/DRAINAGE SUMMARY

APPENDIX A

STORMWATER CONTROL PLAN AND EXHIBITS



LEGEND

SHED 1,000 SF — SHED NAME AND SQUARE FOOTAGE

WATER QUALITY AREA BOUNDARY

DIRECTION OF FLOW

REDUCED PLOT

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REGISTERED PROFESSIONAL ENGINEER · BRYAN P. BONINO · No. 41804 · CIVIL · STATE OF CALIFORNIA

BY Bryan P. Bonino

BRYAN P. BONINO P.E. 41804

DATE 01/08/2024

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:

YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING

EXISTING DRAINAGE MAP

120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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DATE	01.08.24
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JOB NO.	464-81
SHEET	1

1 OF 1

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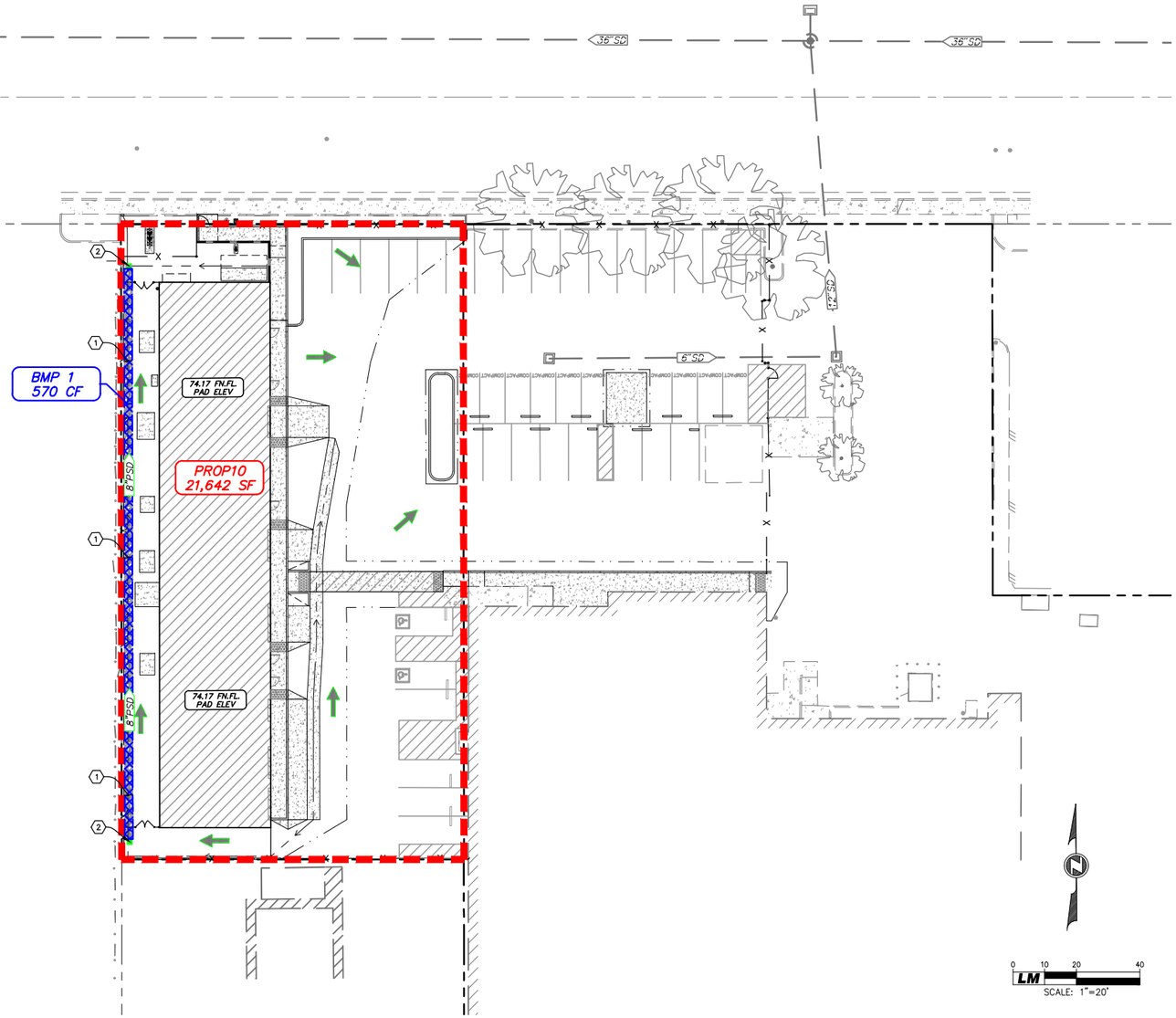


GENERAL NOTES:

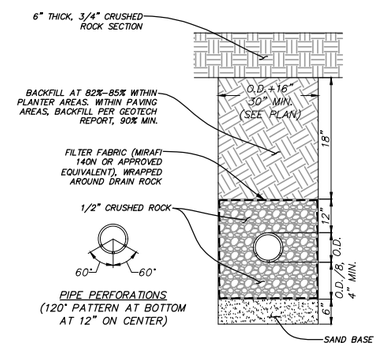
A. SOILS ARE GROUP B, PER USDA SOIL MAP VIEWER REPORT.
B. SITE DRAINS TO CITY STORM DRAIN SYSTEM.
C. SITE IS NOT IN A FEMA SPECIAL FLOOD HAZARD ZONE.

TREATMENT CONTROL MEASURES ⬡:

1. INSTALL INFILTRATION TRENCH FACILITY PER DETAIL 1 ON THIS SHEET. SEE GRADING PLAN, SITE PLAN, UTILITY PLAN, AND LANDSCAPING PLAN FOR MORE DETAIL.
2. INSTALL ADS FLEXSTORM PURE FULL TRASH CAPTURE INSERTS OR APPROVED EQUIVALENT THAT IS CERTIFIED AS FULL TRASH CAPTURE SYSTEM BY THE STATE WATER RESOURCES CONTROL BOARDS.

LEGEND

DMA	DRAINAGE MANAGEMENT AREA
BMP	BEST MANAGEMENT PRACTICE
DMA 1 1,000 SF	WATER QUALITY AREA NAME AND SQUARE FOOTAGE
	WATER QUALITY AREA BOUNDARY
BMP 1 1,000 CF	BEST MANAGEMENT PRACTICE AREA NAME AND STORAGE VOLUME
	INFILTRATION TRENCH
	DIRECTION OF FLOW



PIPE PERFORATIONS
(120° PATTERN AT BOTTOM AT 12" ON CENTER)

TYPICAL TRENCH SECTION

NOTES:

1. SOIL MOISTURE LOW ENOUGH DURING CONSTRUCTION TO PREVENT SMEARING OF TRENCH SIDES AND BOTTOM. IF SMEARING OCCURS CONTRACTOR SHALL SCORE TRENCH TO PROMOTE INFILTRATION TO THE SATISFACTION OF THE ENGINEER.
2. TRENCH BOTTOM TO BE LEVEL PLUS OR MINUS THREE INCHES ALONG THE ENTIRE LENGTH OF PERFORATE PIPE.
3. SIDE WALLS TO BE SCORED TO PREVENT SEALING.

1 INFILTRATION TRENCH
NTS

REDUCED PLOT

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BY Bryan P. Bonino
DATE 01/08/2024 P.E. 41804
BRYAN P. BONINO

JOB TITLE:

CONSTRUCTION DOCUMENTS FOR:
YOLO COUNTY AG DEPARTMENT
SHOPS BUILDING
STORMWATER CONTROL PLAN
120 W. MAIN STREET
WOODLAND, CA

REVISIONS:

	DATE:	DESCRIPTION:
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DATE 01.08.24
DRAWN -
JOB NO. 464-81
SHEET C501
9 OF 13

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STORMWATER QUALITY/DRAINAGE SUMMARY

APPENDIX B

POST-CONSTRUCTION WORKSHEETS

APPENDIX 8 – POST-CONSTRUCTION PROJECT WORKSHEET

POST-CONSTRUCTION WORKSHEET FOR THE CITY OF WOODLAND
PROJECT SUMMARY SHEET

Project Owner Information:

Project Owner Name:	Comstock Johnson Architects, INC.				
Name of Contact Person:	David Helms				
Mailing Street Address:	10520 Armstrong Avenue				
City:	Mather	State:	CA	Zip:	95655
Telephone:		Email:	dave@cja-architects.com		

Project Information:

Project Name:	YOLO COUNTY AG DEPARTMENT SHOPS BUILDING				
Name of Contact Person:	David Helms				
Project Address:	139 WEST MAIN STREET				
City:	WOODLAND	State:	CA	Zip:	95695
Anticipated construction start date:	TBD	Ending date:	TBD		
Project size (ft^2):	37,462 (0.86 acres)	Subject to the Construction General Permit? (Yes / No)	YES		
Information of the Post-Construction Standards Plan Preparer:					
Name of Organization:	LAUGENOUR AND MEIKLE CIVIL ENGINEERS				
Name of Contact Person:	BRYAN BONINO				
Mailing Street Address:	608 COURT STREET				
City:	WOODLAND	State:	CA	Zip:	95695
Telephone:	(530) 662-1755	Email:	BBONINO@LMCE.NET		

Project Applicability:

Type of Project: (Check one)		Small Project (2,500 to 5,000 ft^2 or detached single family home)
	X	Regulated Project (5,000 ft^2)
		Not applicable to the Post-Construction Standards Plan (*provide reason in the space below*)

Is this a redevelopment project? (Yes / No)	YES	Will the project result in an increase of more than 50% of the impervious surface? (Yes / No)	NO
Has the project or the vesting map received approval from the municipality? (Yes, No, or N/A)	NO	Date of project or vesting map approval:	N/A
Describe the nature and scope of the construction project:	THE REDEVELOPMENT PROJECT WILL CONSIST OF A STAND ALONE AG SHOP BUILDING LOCATED IN REAR PARKING LOT		
Number of Drainage Management Areas (DMAs):			1

POST-CONSTRUCTION WORKSHEET FOR THE CITY OF WOODLAND
REGULATED PROJECT DMA SUBMITTAL SHEET

Drainage Management Area (DMA) & Project Information:

*A **separate** Regulated Project DMA Submittal Sheet is required to be completed and submitted for each DMA. Refer to Section 5.1 of the Post-Construction Standards Plan for more information about DMAs.*

Project Name:	YOLO COUNTY AG DEPARTMENT SHOPS BUILDING
Project Owner Name:	DAVID HELMS
Project Address:	139 WEST COURT STREET; APN 064-140-016
Name of the DMA:	DMA 1 - PROP 10
DMA area (ft^2)	21,642

Selection of Applicable Source Controls:

*Indicate which of the following activities or pollutant sources are included in **this DMA** of the new development or redevelopment. For more information about required Source Control refer to Section 5.2.*

Site Design Measures	*(Yes / No)*
Accidental spills or leaks	NO
Interior floor drains	NO
Parking / storage areas and maintenance	YES
Indoor and structural pest control	YES
Landscape / outdoor pesticide use	YES
Pools, spas, ponds, decorative fountains, and other water features	NO
Restaurants, grocery stores, and other food service operations	NO
Refuse areas	NO
Industrial processes	NO
Outdoor storage of equipment or materials	NO
Vehicle and equipment cleaning	NO
Vehicle and equipment repair and maintenance	NO
Fuel dispensing areas	NO
Loading docks	NO
Fire sprinkler test water	NO
Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources	NO
Unauthorized non-storm water discharges	NO
Building and grounds maintenance	YES

Hydrologic Soil Group and Soil Type Information:

*Enter information concerning the soil types **within this DMA**. For more information, refer to Table 7 of the Post-Construction Standards Plan.*

Soil Type Name	HSG Group (A, B, C, or D)
Ya - Yolo Silt Loam	B

Low Impact Development (LID) Design Requirements:

Please describe how the project is meeting each of the following LID design requirements. Provide your response in the text box following each requirement or provide responses on a separate sheet.

1. Define the areas of the project that are to be left undisturbed or protected from soil disturbance. Identify sensitive environmental receptors such as water bodies, stream buffers, existing trees, riparian areas, and habitat areas.

The site is currently being used for automobile parking with no landscaping; no water bodies, stream buffers, riparian areas or habitat area exist in the property. There are a couple existing trees to remain and a couple small ones to be removed. All soil will be disturbed.

2. How is the project concentrating development on portions of the site with less permeable soils and preserving areas that can promote infiltration?

All areas of the site have soils with relatively high infiltration rates.

3. How is the project limiting the overall impervious coverage of the site consisting of paving and roofs?

The impervious coverage will be minimized by providing landscaping areas and infiltration trenches. Imperviousness was minimized with respect to land use objectives and to architectural and civil design criteria and constraints.

4. If applicable, how much setback is there of the development from creeks, wetlands, and riparian habitats?

Creeks, wetlands, and riparian habitats are not near the property. Setbacks for these items were not considered.

5. List and describe the trees that will be preserved.

A couple existing trees will remain and a couple small trees will be removed. The trees that are to be removed are part of the landscaping of the previous development.

6. Describe how the new development or redevelopment site layout will conform along natural landforms.

Natural grade of the site is relatively flat. Natural grade will be maintained as much as possible considering natural grades at the property lines.

7. Describe how the project is avoiding excessive grading and disturbance of vegetation and soils.

Cut and fill will be minimized so that natural grade will be maintained at the property boundary.

8. Describe how the new development or redevelopment is replicating the site's natural drainage patterns.

The property has no significant natural drainage features. Stormwater discharging from the property will be made to mimic natural drainage patterns, to the maximum extent practicable, with the use of landscaping and infiltration trenches.

9. Describe how the project will detain and retain runoff through the new development and redevelopment site.

Referring to Sheet C-501, Stormwater Control Plan, attached, runoff will be detained by proposed site design and treatment control measures. Treatment control measures included infiltration trenches.

Required treatment volumes will be provided by the infiltration trenches. The storage space provided by infiltration trenches (pore space of of drain rock and volume of pipes) and the amount of runoff that infiltrates into the soil during the storm event will meet the required volumes. The infiltration trenches will include pretreatment sumps to increase the effectiveness of the infiltration trenches. After being treated in these facilities, runoff that does not infiltrate into the natural soil underneath will flow to the city storm drain system.

Project Site less than 1 Acre, Hydromodifications not required.

Pre- and Post-Development Project Hydrology Information:

*Provide the following hydrology information for **this DMA**.*

Pre-development Conditions:

Percent Impervious	
Average runoff coefficient for this DMA	
Peak flow rate (ft^3/sec) for this DMA using the 2-year 24-hour design value discussed in Section 5.5.	

Post-development Conditions:

Percent Impervious	
Average runoff coefficient for this DMA	
Peak flow rate (ft^3/sec) for this DMA using the 2-year 24-hour design value discussed in Section 5.5.	

Selection of Site Design and Treatment Control Measures:

*Indicate which Site Design and Treatment Control Measures will be used for **this DMA**. For more information, refer to Table 3. Provide calculations and design drawings for the selected measures per the submittal requirements describe in Section 5.6.*

Site Design or Treatment Control Measure	Sizing Criteria	Selected? (Yes / No)	Enter the Calculated Design Capture Volume or Flow Rate for the Selected Measure
Stream setbacks and vegetated buffers *(Site Design Measure)*	Flow		
Soil quality improvement *(Site Design Measure)*	Volume		
Tree planting and preservation *(Site Design Measure)*	SMARTS Calculator		
Porous pavement *(Site Design Measure)*	Volume		
Green roofs *(Site Design Measure)*	Volume		
Vegetated swales *(Site Design Measure)*	Flow		
Rain harvesting and reuse *(Site Design Measure)*	Volume		
Bioretention and rain gardens *(Treatment Control Measure)*	Volume		
Infiltration trench, Flow-through Planter, or Tree Wells *(Treatment Control Measure)*	Volume and Flow	YES	570
Retention and detention basins *(Treatment Control Measure)*	Volume		

Volume to Meet Treatment (calculations on attached Excel worksheet): minus infiltration 477 CF

BMP Design Volume : 570 CF

Variations and Exceptions:

*Identify any applicable variations or exceptions for **this DMA**.*

Condition	Allowed Variation	Applicable to this DMA? If so, explain.
Facilities located within 10 feet of structures or other potential geotechnical hazards established by the geotechnical expert for the project	May incorporate an impervious cutoff wall between the bioretention / infiltration facility and the structure or other geotechnical hazard	N/A
Facilities with documented high concentrations of pollutants in underlying soil or groundwater, facilities located where infiltration could contribute to a geotechnical hazard, and facilities located on elevated plazas or other structures	May incorporate an impervious liner and may locate the underdrain discharge at the bottom of the subsurface drainage/storage layer (this configuration is commonly known as a "flow-through planter")	N/A
Facilities located in areas of high groundwater, highly infiltrative soils or where connection of underdrain to a surface drain or to a subsurface storm drain are infeasible	May omit the underdrain	N/A
Facilities serving high-risk areas such as fueling stations, truck stops, auto repairs, and heavy industrial sites	Are required to provide additional treatment to address pollutants of concern prior to the flow reaching the infiltration facility	N/A

*If infiltration is not feasible for **this DMA**, please provide an explanation of the infeasibility and a description of the alternate non-infiltrating treatment control measure(s) that will be used in accordance with the development requirements in Section 5.4.4.*

N/A

Regulated Project Submittal Requirements:

The following must be submitted for Regulated Projects to the plan checker:

- The completed Post-Construction Worksheet including page 1 and, for each DMA, pages 3 – 10.
- A separate site plan for each DMA must be submitted. If there are multiple DMAs, a key map showing the location of the DMAs in relationship to one another and the entire site is required to be submitted. Each DMA site plan is required to show the following information:
  - ✓ DMA name and boundary;
  - ✓ The selected Site Design and Treatment Control Measures (identified in Table 3);
  - ✓ The total drainage area in square feet of the DMA;
  - ✓ The pre-development peak flow rate at the point(s) of discharge;
  - ✓ The predicted post-development peak flow rate at the point(s) of discharge;
  - ✓ Areas of existing impervious surfaces (pre-development);
  - ✓ Proposed areas of impervious surfaces (post-development);
  - ✓ Setbacks from creeks, wetlands, and riparian habitats;
  - ✓ Existing topography and drainage patterns (pre-development);
  - ✓ Proposed topography and drainage patterns (post-development);
  - ✓ Soil types, soil type boundaries within the DMA, and their Hydrologic Soil Group Classification rating (A, B, C, or D); and
  - ✓ Trees, vegetation, and sensitive environmental areas to be protected and preserved.

  Each plan must be stamped by a qualified licensed professional. The plans must be stamped by a California Civil Professional Engineer if any of the following control measures were selected: rooftop and impervious area disconnection, porous pavement, rain cisterns, bioretention or rain gardens, infiltration trench, or retention or detention basins. The plans must be stamped by a California Structural Professional Engineer if a green roof was selected or if there is a significant structural aspect to the rain cisterns and collection system. The plans must be stamped by a California licensed Landscape Architect if any of the following Site Design Measures were selected: stream setbacks and buffers, soil quality improvement, vegetated swales, bioretention and rain gardens. The selected Site Design and Treatment Control Measure(s) must be clearly called out on the submitted plans.
- Design drawings for the proposed Treatment Control Measures showing a plan view, elevation view, and subsurface cross-sections must be submitted. Sufficient detail and specifications should be included in these drawings to provide for adequate plan check review and for the construction of the treatment "facility". Each design drawing must be stamped by a qualified licensed professional. The drawings must be stamped by a California Civil Professional Engineer if any of the following control measures were selected: rooftop and impervious area disconnection, porous pavement, rain cisterns, bioretention or rain gardens, infiltration trench, or retention or detention basins. The drawings must be stamped by a California Structural Professional Engineer if a green roof was selected or if there is a significant structural aspect to the rain cisterns and collection system. The drawings must be stamped by a California licensed Landscape Architect if any of the following Site Design Measures were selected: stream setbacks and buffers, soil quality improvement, vegetated swales, bioretention and rain gardens.

- A print out of the results page from the MS Excel™ Volumetric BMP Sizing Tool for each DMA and control measure that requires the volumetric sizing criteria is required to be submitted. (Refer to Appendix 6 for information on how to download the tool.)
- Calculations stamped by the appropriate licensed individual (as described above) for each DMA and control measure that requires flow-based sizing criteria must be included with the submittal.
- An Operation and Maintenance Plan as part of a signed Stormwater Treatment Measure Access and Maintenance Agreement for the proposed treatment control measures must accompany the submittal (refer to Section 6 and Appendix 9).

STORMWATER QUALITY/DRAINAGE SUMMARY

APPENDIX C

TREATMENT RUNOFF VOLUME CALCULATIONS

Two Options for Calculating the Design Volume for the Volumetric BMPs

For projects in the Central Valley from Shasta County to Fresno County

Perform the following steps and enter the requested data. Print this page and include with the project's submittal.

Name of the DMA: PROP10

Step 1: **Enter the size of the Drainage Management Area (DMA):** 21,649 *Square Feet*

Step 2: **Enter the total percentage of impervious area in the DMA:** 82 *% impervious*

i = 0.82 *This is the impervious coefficient (i) used for the Urban Runoff Quality Management approach*

Enter the number of existing or planned trees in the DMA:

Evergreen: 0 Deciduous: 0

Total Tree Credit: 0.0 ft^3

Step 3: **Specify the project location:**

Mileage:	Redding to Sacramento	150 miles	
	Sacramento to Fresno	160 miles	
	Is the project north or south of Sacramento?		North *Select One*
	What is the distance from Sacramento?		5 *Enter miles*
	Percent of distance from Sacramento to	Redding	3.3%

Step 4: **Specify the composite (average) runoff coefficient for the DMA:**

Enter average runoff coefficient for the DMA: 0.8 *Enter decimal coefficient (Refer to the coefficient tab)*

C = 0.629 *This is the average c using the Urban Run Management approa impervious area.*

This is your volumetric design value for the DMA based on the site location and average runoff coefficient.

DMA's Unit Basin Storage Volume (inches): **0.54**

P6 = 0.55 inches *See the P6 Table tab*

Basis for the Calculations (Refer to the attached CASQA Rain Graphs):

Weather Stations	Runoff Coefficients 0.25	0.50	0.75	1.00
Redding	*0.22*	*0.44*	*0.66*	*0.88*
Sacramento	*0.18*	*0.36*	*0.54*	*0.72*
Fresno	*0.12*	*0.24*	*0.37*	*0.49*
Project Location	**0.18**	**0.36**	**0.54**	**0.73**

Unit Basin Storage Volumes (inches) using 80% runoff capture with 48-hour draw down times

Regression constant for 48-hour draw down (a) = 1.963 *Per the CASQA BMP for the Urban Runoff Management Approa*

Step 5: **Select one of the two optional calculations of the required BMP capture volume for the DMA:**

Using the CASQA BMP Handbook Approach:

Required Capture Volume:
981 cubic feet
7,341 gallons
0.023 acre-feet

Use this one *Specify selection*

Using the Urban Runoff Quality Management Approach:

Required Capture Volume:
1,226 cubic feet
9,170 gallons
0.028 acre-feet

Use this one *Specify selection*

Maximum Detention Volume (Po) = 0.680 inches =(a)(P6)(C)

APPENDIX D

RUNOFF VOLUME SUMMARY

PROJECT:	Yolo Ag Shops	DATE:	8-Jan-24
PROJECT #:	464-81	CALC BY:	MDB
LOCATION:	Woodland, CA	CHECKED BY:	NUB
FILE:		SHEETS:	

LAUGENOUR AND MEIKLE
CIVIL ENGINEERS
608 COURT STREET
WOODLAND, CA 95695

Purpose: Runoff volume summary.

DMA	Area, sf	Area, ac	SQV, Treatment, cu.ft.[a]	SQV, Treatment-Infiltration, cu.ft.[b]	Runoff Volume Required, cu.ft.[c]
PROP10	21,649	0.497	981	477	477

(a) SQV = Stormwater Quality Volume. See separate table for calculations.
(b) Stored runoff volume required for SQV minus infiltration.
(c) Max. Runoff Volume = Max. (Required Treatment Vol., Required SQV Vol.)

STORMWATER QUALITY/DRAINAGE SUMMARY

APPENDIX E

REQUIRED BMP VOLUME CALCULATIONS

PROJECT:	Yolo Ag Shops	DATE: 8-Jan-24	LAUGENOUR AND MEIKLE
PROJECT #:	464-81	CALC BY: MDB	CIVIL ENGINEERS
LOCATION:	Woodland, CA	CHECKED BY: NUB	608 COURT STREET
FILE:		SHEETS:	WOODLAND, CA 95695

Purpose: Size the infiltration trench for SQV, BMP 1.

Design Requirement: Retain and infiltrate the required runoff volume.
Account for runoff distribution over time and infiltration rate.

Table 1 - Calculations for Required Underground Storage Space for the Infiltration Trench, BMP 1.

Time Starting (hr)[a]	Time per Step (hr)	% of Total Rainfall (Over Time Step) [b]	Runoff, Max Runoff Volume (cu ft)[c]	Runoff Volume from Max Runoff Volume per Time Step (cu ft)[d]	Design Infil. Rate (ft/hr)[e]	Trench Length (ft)	Trench Width (ft)	Max. Infiltration Volume per Time Step (cu ft)[f]	Stored Runoff (cu ft)[g]
0.00	1	1.06%	981	10.40	0.08333	180	2.5	37.50	0
1.00	1	1.14%		11.19				37.50	0
2.00	1	1.25%		12.27				37.50	0
3.00	1	1.36%		13.35				37.50	0
4.00	1	1.50%		14.72				37.50	0
5.00	1	1.70%		16.68				37.50	0
6.00	1	1.91%		18.75				37.50	0
7.00	1	2.09%		20.51				37.50	0
8.00	1	2.70%		26.50				37.50	0
9.00	1	3.40%		33.37				37.50	0
10.00	1	5.40%		53.00				37.50	15
11.00	0.5	4.80%		47.11				18.75	44
11.50	0.1	2.38%		23.36				3.75	63
11.60	0.1	4.75%		46.62				3.75	106
11.70	0.1	7.64%		74.98				3.75	178
11.80	0.1	13.71%		134.55				3.75	308
11.90	0.1	9.51%		93.33				3.75	398
12.00	0.1	1.90%		18.65				3.75	413
12.10	0.1	1.67%		16.39				3.75	425
12.20	0.1	1.44%		14.13				3.75	436
12.30	0.1	1.21%		11.88				3.75	444
12.40	0.6	4.68%		45.93				22.50	467
13.00	1	4.80%		47.11				37.50	477
14.00	1	3.36%		32.98				37.50	473
15.00	1	2.65%		26.01				37.50	461
16.00	1	2.18%		21.40				37.50	445
17.00	1	1.92%		18.84				37.50	426
18.00	1	1.68%		16.49				37.50	405
19.00	1	1.42%		13.94				37.50	382
20.00	1	1.29%		12.66				37.50	357
21.00	1	1.21%		11.88				37.50	331
22.00	1	1.19%		11.68				37.50	305
23.00	1	1.11%		10.89				37.50	279
24.00									
Total		100%		982				900	
Max									477

(a) Time steps in hours.
(b) Based on SCS Type II 24-hour storm.
(c) Total runoff volume for the maximum runoff volume (of stormwater quality).
(d) Runoff volume for the maximum runoff volume spread over time is estimated as: % of Total Rainfall (Over Time Step) x (Next Time Starting,hr - Current Time Starting, hr)
(e) As determined from USDA soil map.
(f) Maximum infiltration per time step is estimated as the design infiltration rate per foot of trench multiplied by the bottom surface area of the trench (Trench Width x Trench Length)
(g) Stored Runoff, Current = Stored Runoff, Previous Time Step + Runoff Volume, Current - Infiltration Volume, Current. If Stored Volume, Current < 0, set = to 0

STORMWATER QUALITY/DRAINAGE SUMMARY

APPENDIX F

VOLUME PROVIDED BY BMP

PROJECT: Yolo Ag Shops
PROJECT #: 464-81
LOCATION: Woodland, CA
FILE:

DATE: 8-Jan-24
CALC BY: MDB
CHECKED BY: NUB
SHEETS:

LAUGENOUR AND MEIKLE
CIVIL ENGINEERS
608 COURT STREET
WOODLAND, CA 95695

Table 1 - Storage Volume Provided by the Infiltration Trench, BMP 1.

					Pipe/Structure							Trench Rock												
LID/BMP	Location	Type	Storage Component	Quantity	Inside Diam. (in.)	Outside Diam (in.)[a]	Inner XS Area (ft^2)[b]	Outer XS Area (ft^2)[c]	Length (ft)	Storage Volume, Provided (cu ft)[d]	Volume to Subtract from Rock (cu ft)[e]	Min. Trench Width (ft)[f]	Trench Width (ft)	Trench Length (ft)	Trench Surf. Area, Ave. (ft^2)	Min. Trench Depth (ft)[g]	Trench Depth (ft)	Rock Porosity	Gross Trench Retention Volume (cu ft)[h]	Volume, Pipes/Structures, to Subtract from Rock (cu ft)[i]	Gross Rock Volume (cu ft)[j]	Storage Volume, Provided (cu ft)[k]	Storage Volume, Provided, Total (cu ft)[l]	Required Storage Volume (cu ft)[m]
1	West	Infiltration Trench	Surf. Reservoir																					
			Pipe 1	1	8	9.1	0.349	0.452	180	63	81.3													
			Pipe 2																					
			StormTech MC-3500																			-		
			Soil Pore Space																					
			Rock/Sand Pore Space												-				-		-	-		
			Rock/Sand Pore Space	1								2.50	2.50	180	450	2.6	3.00	0.4	1,350	81	1,269	507		
			Total							**63**	81.3											**507**	**570**	477

(a) Based on ADS Landmax Stormwater Management System perforated pipe.
(b) For pipe, A = 3.14 x (Inside Diam./2)^2. Diameter converted to feet.
(c) For pipe, A = 3.14 x (Outside Diam./2)^2. Diameter converted to feet.
(d) Storage Volume Provided = Inner Volume = Inner XS Area X Pipe/Structure Length.
(e)Volume to Subtract from Rock = Outer Volume = Outer XS Area X Pipe/Structure Length.
(f) Min. Trench Width = Outside Diameter/Width of Pipe/Structure + Min. Clearances
(g) Min. Trench Height = Outside Diameter/Height of Pipe/Structure + Min. Clearances + Sand Layer Thickness
(h) Gross Trench Volume = Ave. Surface Area x Depth.
(i) = Total Outer Volumes of Pipes and Structures.
(j) Gross Rock Volume = Gross Trench Volume - Total Outer Volume of Pipes and Structures
(k) Volume of Rock Storage Space = Gross Rock Volume x Porosity
(l) Storage Volume, Provided = Volume Provdide of Pipes/Structures + Volume of Rock Storage Space
(m) Required Storage Volume calculated in separate table.

City of Woodland

COMMUNITY DEVELOPMENT DEPARTMENT
300 FIRST ST WOODLAND, CA 95695
PH(530)661-5820 FAX (530)406-0832

ENCROACHMENT PERMIT APPLICATION

Please fill out completely

Location of Work: 139 WEST COURT STREET

Improvements or Impact to ROW: UTILITY SERVICE CONNECTION AND TRENCHING TO ONSITE CONSTRUCTION CONSISTING OF 1.5" WATER SERVICE, 6" WATER SERVICE, AND 6" SEWER SERVICE WITH APPURTENANCES.

- ☑ **Improvement Plans or Drawing Attached** (Please attach a drawing showing the location of work to be done)
- ☐ **Traffic Control Plan** (For sidewalk, lane, or road closure)
- ☑ **Engineer's Estimate of Cost** or **Contractor's Bid** **Amount:** YES
- ☐ **Plan Check Deposit for 3% of Cost Estimate** (Full Improvement Plans Only)

Estimated Starting Date: 04/2024

Estimated Time to Complete: 11/2024

The undersigned does hereby agree to comply with the current City of Woodland Standard Specifications and Details, City ordinances, and ***with the Rules and Regulations as stated on the reverse side of this permit.*** Application will not be processed without a signature.

APPLICANT'S SIGNATURE: _____ **DATE:** _____

PRINT NAME CLEARLY: _____

APPLICANT INFORMATION
(To be contacted with permit questions)

Name, Company: _____
Name, Person: _____
Title: _____
Address: _____
City, State, Zip: _____
Office Phone: _____
Cell Phone: _____
Other: _____

- ☐ **Owner**
- ☐ **Contractor**
- ☐ **Other** _____

FIELD CONTACT
(To be contacted with construction questions)

Name, Company: _____
Name, Person: _____
Title: _____
Best Phone: _____

ENGINEER/ARCHITECT

Name, Company: LAUGENOUR AND MEIKLE
Name, Person: BRYAN BONINO
Title: PRINCIPAL ENGINEER
Best Phone: 1-530-662-1755

BILLING INFORMATION

Company: _____
Contact Name: _____
Address: _____
City, ST, Zip: _____
Phone: _____
Customer Job#: _____

Billing available for public utility companies only.

OFFICE USE ONLY

Field Review by: _____
Date: _____
❒ Field Review Approved ❒ TCP Routed ❒ TCP Approved

Field Notes:

_____
_____
_____
_____
_____
_____
_____
_____

Permit #
ENCR- -

Fees Due:

Permit	$
Inspection	$_____
Tap Fees	$_____
Other	$_____
Total Permit Fees	**$**_____
Plan Check Paid	**$**_____
Balance Due	**$**_____

❒ PAID

Submitted by:
❒ Counter ❒ Fax
❒ Mail ❒ Email

Billing Info:
❒ TO BE BILLED
# of Insp. Hours____

Customer #_____
Billing #_____
Billing Date_____
Bill Sent_____

❒ Payment Received
Receipt Date
Receipt #

VALIDATION

GENERAL PROVISIONS

1. **NOTIFICATION OF POLICE, FIRE, AND PUBLIC WORKS DEPARTMENTS –** When streets are to be blocked, the Police, Fire, and Public Works Departments are to be notified each day the street is to be blocked and/or when traffic is delayed or hindered. Access to fire hydrants shall be maintained at all times. Streets will not be closed without prior approval of the Public Works Director or his authorized representative. *Call County Communications at (530) 666-8920.*
2. **VALIDATION –** This permit is not valid unless signed by the Public Works Director or his authorized representative.
3. **REVOCATION –** This permit is non-transferable and is void if work is not completed prior to expiration date. An extension may be granted if such extension is requested forty-eight (48) hours before the permit expires.
4. **ACCEPTANCE OF PROVISIONS –** It is understood and agreed by the permittee that the doing of any work under the permit shall constitute an acceptance of the provisions.
5. **KEEP PERMIT ON JOBSITE –** This permit shall be kept on the jobsite and must be shown to any representative of the City of Woodland upon request.
6. **INSPECTION AND APPROVAL –** A minimum of twenty-four (24) hours notice shall be required prior to placing any backfill, connection to any existing facility or the placement of any concrete or paving work. Inspection shall not be deemed a waiver on the part of the City of the right to demand correction of defects discovered at a subsequent date.
7. **STANDARD SPECIFICATIONS –** All work shall conform to the City of Woodland Standard Specifications and Details and the State of California Standard Specifications.
8. **MINIMUM INTERFERENCE WITH THE PROTECTION OF TRAFFIC –** All work shall be planned and carried out so there will be the least possible inconvenience to the traveling public. Placing of lights, barricades, warning signs and other safety devices required for public safety shall be the responsibility of the permittee. All safety provisions and devices shall conform to the requirements of the current edition of California Manual of Uniform Traffic Control Devices.
9. **FAILURE TO COMPLY WITH GENERAL PROVISIONS –** The permittee agrees to reimburse the City for performing all work and furnishing all material to correct any failure to comply with these provisions as well as all applicable City Ordinances and Standard Specifications currently in effect.
10. **NOTIFICATION OF UTILITY COMPANY –** The permittee shall notify utility companies two (2) working days prior to beginning any construction which may involve underground or overhead facilities and will pay all expenses for any removal or relocation necessary. Notification shall be given through Underground Service Alert (USA) 1-800-227-2600. Valves on water mains may not be turned off without permission of the Public Works Director or his authorized representative.
11. **CLEANUP OF JOBSITE –** The permittee will remove all refuse material from the jobsite within three (3) days after completion of the work.
12. **DELINQUENT BILLS –** Failure to pay any delinquent bill accrued under any previous permit issued by the Public Works Department will be cause for rendering the applicant ineligible for any other permit from the Public Works Department until such bill is paid.
13. **MEETING EXISTING IMPROVEMENT –** The permittee is responsible for meeting all adjacent frontage improvements such as paving and sidewalks.
14. **MAINTENANCE AND REPAIR –** The permittee is responsible for the maintenance and repair of encroachment for a period of one (1) year after acceptance by the City.

TO THE PERMITTEE

To provide a more efficient and economical inspection service for Encroachment Permit construction, we are asking that the following procedure be followed by all permittees when work authorized by the permit will be required by the City.

1. Notify the inspector at least forty-eight (48) hours prior to the start of work.
2. Discuss with the inspector any unusual or difficult features of the construction.
3. Notify the inspector one (1) day in advance to cancel a scheduled inspection or to request an additional or earlier inspection.
4. Notify the inspector upon completion of construction (530) 661-5961.

INSPECTION SCHEDULE

Listed below are several types of construction and points at which inspection must be made prior to continuing construction operations. Unauthorized continuance of construction beyond an inspection point may result in rejection of all work.

CONCRETE

1. Grade and excavation before forming.
2. Forms before placement of concrete.
3. Cleanup and final approval.

PIPE LAYING

1. Excavation and bedding.
2. Pipe laying.
3. Backfill (compaction test may be required)
4. Final approval.

TRENCHING

1. Prior to backfill.
2. Prior to placing concrete cap.
3. Prior to and after paving.

_____
Read Initials

SECTION 00 61 00
COUNTY OF YOLO

PERFORMANCE BOND
(To Accompany Contract)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the County of Yolo, organized and operating under the laws of the State of California, (hereinafter referred to as the "County") has awarded to _____, (hereinafter referred to as the "Contractor") an agreement for **Contract No.**_____, (hereinafter referred to as the "Project").

WHEREAS, the work to be performed by the Contractor is more particularly set forth in Contract No. for the Project dated _____, (hereinafter referred to as "Contract Documents"), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by the Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of said Contract Documents.

NOW, THEREFORE, we, _____, the undersigned Contractor and _____ as Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto the County in the sum of _____ DOLLARS, ($_____), said sum being not less than one hundred percent (100%) of the total amount of the Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Contractor, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any alteration thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill all obligations including the one (1) year guarantee of all materials and workmanship; and shall indemnify and save harmless the County, its officials, officers, employees, and authorized volunteers, as stipulated in said Contract Documents, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees including reasonable attorney's fees, incurred by the County in enforcing such obligation.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, the above obligation shall hold good for a period of one (1) year after the acceptance of the work by the County, during which time if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the

County from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the County's rights or the Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure Section 337.15.

Whenever Contractor shall be, and is declared by the County to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at the County's option:

i. Take over and complete the Project in accordance with all terms and conditions in the Contract Documents; or

ii. Obtain a bid or bids for completing the Project in accordance with all terms and conditions in the Contract Documents and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a contract between such bidder, the Surety and the County, and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the County under the Contract and any modification thereto, less any amount previously paid by the County to the Contractor and any other set offs pursuant to the Contract Documents.

iii. Permit the County to complete the Project in any manner consistent with California law and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the County under the Contract and any modification thereto, less any amount previously paid by the County to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that the County may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor.

Surety shall not utilize Contractor in completing the Project nor shall Surety accept a bid from Contractor for completion of the Project if the County, when declaring the Contractor in default, notifies Surety of the County's objection to Contractor's further participation in the completion of the Project.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project.

[REMAINDER OF PAGE LEFT INTENTIONALLY BLANK]

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20___.

(Corporate Seal)

_____
Contractor/ Principal

By_____

Title_____

(Corporate Seal)

_____
Surety

By _____
Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title_____

The rate of premium on this bond is _____ per thousand. The total amount of premium charges is $_____.
(The above must be filled in by corporate attorney.)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety) _____
_____
_____

(Name and Address of Agent or Representative for service of process in California, if different from above) _____
_____
_____

(Telephone number of Surety and Agent or Representative for service of process in California) _____

NOTE: Signatures of those executing for Surety must be properly acknowledged. The bond must be accompanied by a properly acknowledged Power of Attorney from the Surety authorizing its agent to bind it to this bond. A copy of such Power of Attorney must be on file with the Yolo County Clerk.

SECTION 00 62 00

PAYMENT BOND

BOND NO. _____

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the County of Yolo, State of California, ("Owner") has awarded to _____ ("Contractor/Principal") a contract (County Agreement No._____, dated _____,_____ , referred to as the "Agreement") for the work described as _____. The Agreement is incorporated by this reference into this Payment Bond ("Bond"); and

WHEREAS, Contractor/Principal is required to furnish a bond in connection with the Agreement and pursuant to California Civil Code section 9550;

NOW, THEREFORE, we, _____ _____ the undersigned Contractor/Principal, and _____ _____, ("Surety"), a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the County of Yolo, and to any and all persons, companies, or corporations entitled by law to file stop payment notices under California Civil Code Section 9100, or any person, company, or corporation entitled to make a claim on this bond, in the sum of _____DOLLARS ($_____), which such sum being not less than one hundred percent (100%) of the total amount payable by the Owner under the terms of the Agreement, for which payment will and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if Contractor/Principal, its heirs, executors, administrators, successors, or assigns, or subcontractor, shall fail to pay any person or persons named in Civil Code section 9100; or fail to pay for any materials, provisions, or other supplies, used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code, with respect to work or labor thereon of any kind; or shall fail to deduct, withhold, and pay over to the Employment Development Department, any amounts required to be deducted, withheld, and paid over by Unemployment Insurance Code Section 13020 with respect to work and labor thereon of any kind, then Surety will pay for the same, in an amount not exceeding the amount herein above set forth, and in the event suit is brought upon this bond, also will pay such reasonable attorneys' fees as shall be fixed by the court, awarded and taxed as provided in California Civil Code Section 9550 et seq.

It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, or specifications, or agreement pertaining or relating to

any scheme or work of improvement herein above described; or pertaining or relating to the furnishing of labor, materials, or equipment therefor; nor by any change or modification of any terms of payment or extension of time for payment pertaining or relating to any scheme or work of improvement herein above described; nor by any rescission or attempted rescission of the contract, agreement or bond; nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond; nor by any fraud practiced by any person other than the claimant seeking to recover on the bond; and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given; and under no circumstances shall the Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Owner and Contractor/Principal or on the part of any obligee named in such bond; that the sole condition of recovery shall be that the claimant is a person described in California Civil Code section 9100, and who has not been paid the full amount of his or her claim; and that the Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned, including but not limited to the provisions of sections 2819 and 2845 of the California Civil Code.

Any notice to Surety may be given in the manner specified in the Agreement and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

[REMAINDER OF PAGE LEFT INTENTIONALLY BLANK]

IN WITNESS WHEREOF, two identical counterparts of this Bond, each of which shall for all purposes be deemed an original thereof, have been duly executed by Contractor/Principal and Surety above named, on the ___ day of _____, 20__.

_____ (SEAL)
Contractor/Principal

By: _____
Contractor/'s Representative

_____
Contractor/Principal's Address

_____
City, State, Zip

_____ (SEAL)
Surety
By: _____
Surety's Representative

_____
Surety's Address

_____
City, State, Zip

_____
Telephone Number

NOTE: Signatures of those executing for Surety must be properly acknowledged. The bond must be accompanied by a properly acknowledged Power of Attorney from the Surety authorizing its agent to bind it to this bond. A copy of such Power of Attorney must be on file with the Yolo County Clerk.

FOR USE BY THE PRIME CONTRACTOR WITH THE COUNTY OF YOLO

SECTION 00 70 00

GENERAL CONDITIONS
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GENERAL CONDITIONS

ARTICLE 1.

DEFINITIONS AND PRINCIPLES OF INTERPRETATION

Section 1.01. DEFINED TERMS.

Whenever the following terms, titles, or phrases are used in the Contract Documents, the intent and meaning thereof shall be as defined in this Article.

Section 1.02. ADDENDUM/ADDENDA.

"Addendum" or "Addenda" are written documents furnished by the County before Award of the Contract which interpret Drawings and/or Specifications or answer questions of intended bidders and shall be incorporated in and are a part of the Contract Documents.

Section 1.03. AGREEMENT FOR CONSTRUCTION.

The "Agreement for Construction" is the written contract between the County and the Contractor by which the Contractor agrees to perform the Work necessary for full completion of the Project as intended, or the portions of the Project incorporated into the Contract. The Agreement for Construction includes the Contract Documents.

Section 1.04. ALLOWANCE.

An "Allowance" is the County's monetary and/or quantity estimate for equipment, materials, or work, the quantity and/or quality of which the County has not determined at the time of the Award of the Contract. The Contractor's bid includes all specified allowances, if any. "Allowance" also includes the contingency allowance specified to be included in the Contractor's bid, if any.

Section 1.05. AWARD OF CONTRACT; DATE.

The "Award of the Contract" is the action by the County Administrators Office of the County to execute the Agreement for Construction with the lowest responsible bidder and constitutes the County's acceptance of the Bid offer.

The Award of the Contract occurs after the County has determined which bid alternates, if any, are to be included in the Work, and has determined whether the apparent low bidder for the Work, including such alternates, is the lowest responsible bidder.

The date of the Award of the Contract is the date the County Administrators Office acts to authorize execution of the Agreement for Construction by the County, even though actual execution of the Agreement by the County does not occur until the Contractor submits the bonds and insurance certifications required by Article 2.

Section 1.06. BID.

The "Bid" shall mean the offer of the bidder to do the Work, when submitted on the prescribed bid form, duly executed and bonded. After Award of the Agreement for Construction by the County to the lowest responsible bidder, "Bid" shall mean the Contract Price.

Section 1.07. BOARD OF SUPERVISORS/COUNTY ADMINISTRATIVE OFFICER.

"Board of Supervisors" shall mean the duly elected officials constituting the Yolo County Board of Supervisors.

"County Administrative Officer" (CAO) is the County Administrative Officer of the County and reports to the Board of Supervisors, or the CAO's designee.

Section 1.08. CERTIFICATION.

When used in the context of required submittals regarding quality assurance, "Certification" shall be the verification required from recognized producers or associations attesting to a product's compliance with the Contract Documents. Examples include Underwriters Laboratory ("UL") listings.

Section 1.09. CHANGE ORDER.

A "Change Order" is a written order from the County to the Contractor authorizing an addition, deletion, or revision in the Scope of the Work, and/or an adjustment in the Contract price or Contract Time, issued after the execution of the Agreement for Construction.

Section 1.10. CLARIFICATIONS.

"Clarifications" are supplementary explanations, interpretations, instructions, and/or drawings issued by the Contract Administrator to further define the intent of the Contract Documents, pursuant to Article 4 of the General Conditions and procedures developed by the Contract Administrator pursuant thereto.

Clarifications involve no change in the Scope, Price or Time of the Agreement for Construction.

Section 1.11. CONTRACT ADMINISTRATOR/PROJECT MANAGER.

See Section 3(a) of the Agreement for Construction.

Section 1.12. CONTRACT DOCUMENTS/PROJECT MANUAL.

The "Contract Documents" shall include the Bid Proposal; the Designation of Subcontractors; the Agreement for Construction; the Bonds required thereby; these General Conditions; the Supplementary Conditions, if any; the Technical Specifications; all Documents comprising the bidding package; the Contract Drawings, (collectively referred to as "Project Manual"); all duly issued Addenda, Clarifications, Field Orders, and Work Authorizations; Change Orders; Supplemental Drawings; Contractor's Submittals approved pursuant to Articles 3 and/or 5 hereof, and the Contractor's Guarantee and Bonds. The Contract Documents comprise the "Agreement for Construction."

Section 1.13. CONTRACT DRAWINGS.

The "Contract Drawings" or "Drawings" shall mean the working drawings of the Work approved by the Board of Supervisors for the receipt of bids, plus all supplemental drawings approved by the County as

Addenda or Clarifications, or reproductions thereof, which show the location, character, dimensions, and details of the Work to be done, and which are part of the Agreement for Construction.

Section 1.14. CONTRACT PRICE.

The "Contract Price" is the total consideration for which the contractor agrees to perform the Work to produce a fully complete Project as intended by, and in accordance with, the Contract Documents. Unless modified by a duly issued Change Order, the Contract Price is the Contractor's Bid.

Section 1.15. CONTRACT TIME.

The "Contract Time" is the time specified in the agreement for Construction within which Contractor shall fully complete the Project in accordance with the Agreement for Construction. The Contract Time may be changed only by a Change Order duly issued by the Contract Administrator. Contract Time begins with the date of the Notice to Proceed and ends with acceptance of project work completion by the County. The number of days included in the agreement form includes the estimated number of construction days required and not the 35 days allowed for initial submittals and the 21 days allowed for County review of those submittals.

Section 1.16. CONTRACTOR; PRIME CONTRACTOR.

"Contractor" and "Prime Contractor" shall mean the person or persons, co-partnership or corporation, or his or their legal representatives, or successors, assigns, executors, or heirs, who have entered into the Agreement for Construction with the County of Yolo.

Section 1.17. COUNTY.

"County" shall mean the County of Yolo, a political subdivision of the State of California.

Section 1.18. COUNTY INSPECTOR.

The "County Inspector" is the person(s) and/or firm(s), if any, employed or engaged as (an) independent contractor(s) by the County to inspect the performance of the Work by the Contractor for compliance with the Contract Documents. The County Inspector is supervised by and reports to the Contract Administrator. The authority of the County Inspector is limited to that specified in the Contract Documents, and no additional authority has been granted nor shall be inferred.

The Project Manager performs the duties of the County Inspector unless a separate person or firm is engaged as County Inspector.

Section 1.19. DAY/HOLIDAY; WORKING DAY; COUNTING DAYS.

A "day" shall mean a calendar day of 24 hours, including each and every day of the year.

A "working day" is Monday through Friday, but shall exclude "holidays" established by the Sacramento Builders' Exchange.

Unless specified as being working days, all references herein to the number of days within which an action is to occur shall mean calendar days.

In computing working days or calendar days, the first day is excluded and the last day is included, unless it is a Saturday, Sunday, or holiday.

Section 1.20. RESERVED.

Section 1.21. MATERIALS.

"Materials" shall include all building materials, articles, supplies, and equipment delivered to the Site for incorporation in the Work. "Materials" includes everything incorporated into the work except personal services and labor, unless otherwise noted.

"Equipment" shall mean all pre-manufactured or partially pre-assembled products or components, assembled or partially assembled before delivery to the Site, and intended for incorporation into the Work.

Section 1.22. NOTICE OF CESSATION OF WORK.

A "Notice of Cessation of Work" is a notice containing the information required by Civil Code Section 3092, recorded in the Yolo County Recorder's Office, indicating that there has been a continuous cessation of labor on the Work of the Agreement for Construction for at least thirty (30) days prior to recordation of the Notice. The Notice shall specify the date on or about when the cessation of labor commenced.

Section 1.23. NOTICE OF COMPLETION.

A "Notice of Completion" is a notice containing the information required by Civil Code Section 3093, recorded in the Yolo County Recorder's Office, indicating that the Work of the Agreement for Construction has been accepted by the County.

Section 1.24. PROGRAM MANAGER.

If assigned by the Contract Administrator, "the Program Manager" is that County official responsible for team leadership in coordinating departmental program requirements; for preparation of the statement of project objectives; for presenting project objectives to the Contract Administrator and Board of Supervisors; for heading the design team (for designated projects); for arranging project financing; for maintaining program oversight during the bidding and construction phases; and for providing joint progress reports, with the Contract Administrator, to the Board of Supervisors. The program manager represents the County to State and/or Federal program offices sponsoring the project. In the absence of an assigned program manager, the Contract Administrator shall discharge these duties.

Section 1.25. PROJECT.

The "Project" is the total construction, of which the Work performed under the Agreement for Construction is the whole unless the Contract Documents specifically note to the contrary.

Unless so noted, the terms "Project" and "Work" are synonymous.

Section 1.26. PROJECT ARCHITECT/ENGINEER/CONSULTANT.

The "Project Engineer" is the firm employed or engaged as an independent contractor by the County to design the Project, and all sub-consultants or joint ventures of the Project Engineer. The authority of the Project Engineer to bind the County is limited to that authority specified in the Contract Documents, and no additional authority has been granted nor shall be inferred.

The Project Engineer advises the Contract Administrator in all aspects of the construction phase of the Project. The Project Engineer’s functions include advice and assistance to the Contract Administrator in the correct interpretation and application of the Contract Documents. However, the

Contract Administrator or his/her designate is the County's representative on the Project, not the Project Engineer. The Project Engineer is not authorized independently to issue Addenda, Clarifications, Field Orders, Work Authorizations, or Change Orders, or in any other way to bind the County in discussions with the Contractor.

The Contractor shall deliver all correspondence relating to the proper execution of the Work to the Contract Administrator, with a copy delivered to the Project Engineer. The Contract Administrator reserves the right to consult with the Project Engineer prior to responding to the Contractor's correspondence.

When discussions between the Contractor and the Contract Administrator occur either on the Site or elsewhere, but the Project Engineer is not present, the Contract Administrator reserves the right to consult with the Project Engineer prior to issuing his final decision or instruction.

Section 1.27. REFERENCE TO CODES.

Unless otherwise noted, all references to statutes are to the law of the State of California as codified in the various specified codes.

Section 1.28. SITE.

"Site" is the area designated in the Contract Documents within which the Project is to be constructed.

Site for this purpose includes the area where Work on utility systems for the Project is to be performed by the Contractor under the Agreement for Construction, even though such areas may be designated as "off-site" on the Contract Drawings.

Section 1.29. SPECIFICATIONS.

"Specifications" shall mean the Technical Specifications portions of the Project Manual (Volume II) regarding qualities of materials and/or methods of workmanship to be furnished under the Contract. Specifications are organized into divisions, sections, and articles to enable grouping of the various portions of the Work into logical format, but this organization does not in any way restrict the Contractor in dividing the Work among subcontractors, or in establishing the extent of the Work to be performed by any trade.

Section l.30. SUBCONTRACTOR.

Unless other specified, "subcontractor" refers to all contractors doing any work on the Project, including first, second, and subsequent tier contractors, excluding only the Prime Contractor.

Section 1.31. SUBMITTALS.

As used in Articles 3 and 5 hereof, "submittals" shall mean shop drawings, product data, and samples, as defined below:

A. Shop Drawings are drawings, diagrams, schedules and other data specifically prepared for the Work by the Contractor or any subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work, and/or the method of installation of Materials.

B. Product Data are illustrations, standard schedules, performance charts, certifications, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.

C. Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

As used elsewhere herein, "submittals" is a general term including all information, certifications, data or samples required to be delivered by the Contractor to the County.

Section 1.32. SUPPLEMENTARY CONDITIONS.

The "Supplementary Conditions" are specific clauses in the Project Manual setting forth conditions or requirements peculiar to the Work, and supplementary to the General Conditions.

Section 1.33. WORK/NOTICE TO PROCEED.

The "Work" is the completed construction required by the Contract Documents to perform the Agreement for Construction fully and completely, and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

Unless specifically noted in the contract Documents as not included in the Agreement for Construction, "work" includes all construction necessary to fully complete the Project as intended, including all bid alternates selected by the County for inclusion in the Work.

Unless so noted, the terms "Work" and "Project" are synonymous.

The Work shall commence upon issuance by the County of a Notice to Proceed so authorizing.

Section 1.34. WORK AUTHORIZATIONS.

"Work authorizations" are written orders to the Contractor, which amend the Contract Documents as described, and authorize the Contractor to proceed with the Work noted therein. Pursuant to Section 17.03 hereof, Work Authorizations may be cumulated into periodic Change Orders to adjust the Contract Price and/or Time, upon verification by the Contractor of the actual cost and delay, if any, caused by the Work Authorization.

ARTICLE 2.

BONDS; INDEMNIFICATION; INSURANCE

Section 2.01. BONDS; SUBMITTALS.

Within ten (10) calendar days following the Award of the Contract, and before the County will execute the Agreement for Construction, the Contractor to whom the Contract is awarded shall obtain and submit to the County bonds as set forth below in Sections 2.02 and 2.03. The Contractor is advised that a copy of the Power of Attorney authorizing execution of the bonds on behalf of the corporate surety must be filed with the Yolo County Clerk prior to approval of the bonds by the County.

Provision of the bonds required by Sections 2.02 and 2.03, and the insurance certificate required by Section 2.07 is a condition precedent to the Contractor's rights on the Agreement for Construction and a material covenant thereof.

Section 2.02. PERFORMANCE BOND.

The Contractor shall submit a faithful performance bond on the form provided with the Instructions to Bidders, duly executed by a responsible corporate surety authorized to do business in the State of California and acceptable to the county, conditioned upon the faithful performance by the contractor of all requirements of the Contract Documents. The amount of said bond shall be in a sum no less than One-Hundred Percent (100%) of the total Contract Price.

Section 2.03. LABOR AND MATERIALS PAYMENT BOND.

The Contractor shall submit a payment bond on the form provided with the Instructions to Bidders, duly executed by a responsible corporate surety authorized to do business in the State of California and acceptable to the County, which in all respects complies with Civil Code Section 9550 and following. This bond, hereinafter referred to as a "Payment Bond", shall be in a sum no less than One-Hundred Percent (100%) of the total Contract Price.

Section 2.04. CONTRACT BOND.

Prior to final payment as provided in Article 26, Contractor shall furnish a bond issued by a responsible corporate surety licensed to do business in the State of California in a form provided or approved by the County, and securing the performance by Contractor of his obligation undertaken by virtue of the guarantees required by Article 26. Such bond shall remain in full force and effect for a period of no less than one (1) year from and after recordation by the County of a Notice of Completion or a Notice of Cessation of Work, and shall be in a sum no less than ten (10%) percent of the total amount of the final Contract Price. In lieu of such bond, the Contractor may submit a certified or cashier's check, cash, or an irrevocable, unconditional letter of credit in a form acceptable to County, or may extend the final withhold account on terms and conditions acceptable to the county to secure performance of Contractor's obligations on the guarantee.

Section 2.05. INDEMNIFICATION.

Contractor shall pay the cost of defense, indemnify, and save harmless the County of Yolo and all its officers, agents and employers from any and all claims, demands, damages, costs expenses, injury and liability of every kind, nature and description, arising or alleged to have arisen directly or indirectly from the performance or attempted performance of the Agreement for Construction of the Work, or from the nature of the Work, or by products, materials or equipment installed in or used on the Work, howsoever the same may be caused, without set off due to the Contractor's right, if any, to apportionment between joint tortfeasors.

This indemnity obligation extends to, but is not limited to, all acts, errors, omissions, and active and/or passive negligence by the Contractor, all subcontractors, all material suppliers, and their officers, employees, agents, or subcontractors, and includes all acts, errors, omissions, and active and/or passive negligence alleged to be joint or concurrent by them and the County or any of its officers, employees, agents, independent contractors or consultants, save only liability caused exclusively by the sole negligence, willful misconduct or defects in design provided by the County or its officers, employees, agents or independent contractors (other than the Prime Contractor) who are directly responsible to the County.

This indemnity obligation expressly extends to and includes, but is not limited to any and all claims, demands, damages, costs, expenses, or liability occasioned as a result of damages to the work, the Site or improvements thereon, or to adjacent property; and for injuries occurring after completion of the Work, as well as during the progress of the Work; and as a result of the violation of any provision of Federal or State law; and for inverse condemnation or equitable relief; and occasioned by personal and/or bodily injury to or death of any person, or any damage to property owned by any person while on or about the premises by right or not, whenever the work is alleged to have been a contributing cause in any degree whatsoever.

Nothing contained in this indemnity provision shall be construed to require the Contractor to indemnify the County in contravention of Section 2782 of the Civil Code. Contractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnification obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement. In providing any defense under this Section, the Contractor shall use counsel reasonably acceptable to the County.

Section 2.06. INDEMNIFICATION OF ADJACENT PROPERTY OWNERS.

In the event the Contractor enters any agreement with the owners of any property adjacent to the Site and enters upon such property for the purpose of performing the Work, the Contractor shall fully indemnify, defend and save harmless such person, firm, or corporation, State or other governmental agency which owns or has any interest in such adjacent property. The form and content of such indemnification agreement shall be approved by County prior to commencement of the Work on or about such property. Contractor also shall indemnify the County as provided in Section 15.06.

Section 2.07. INSURANCE; SUBMITTALS.

The Contractor shall obtain, at its sole cost and expense, all insurance specified in the Agreement for Construction, and shall require all subcontractors to maintain insurance as specified therein. Continued maintenance of such insurance is a material covenant of the Agreement for Construction.

In addition to the submittals required by the Agreement for Construction, the County reserves the right to examine the insurance policies referenced in any such Certificate at any time, before or after issuance of the Notice to Proceed. Issuance of the Notice to Proceed shall not constitute a waiver of the County's right strictly to enforce the requirements of this Article.

The Contractor shall submit photocopies of its insurance and/or subcontractors' insurance policies when requested by the Contract Administrator.

Section 2.08. CONTRACTOR'S INSURANCE REQUIREMENTS.

Consistent with the Agreement for Construction, Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property that may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors. Any deviation from the required coverage specified in the Agreement for Construction must be approved by the County prior to the commencement of the work.

Section 2.09. SUBCONTRACTORS' INSURANCE.

Subcontractors

A. **Insurance Coverage Requirements**. Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated in the Agreement for Construction and herein.

B. **(Reserved)**

C. **Contractor Responsibilities.** It shall be the responsibility of the Contractor to certify that all subcontractors (including lower-tier subcontractors) comply with these provisions, and to enforce their continued compliance throughout the progress of the Work. The submittals required to demonstrate initial compliance with this Section are specified in Section 3.02 hereof. Thereafter, the Contractor shall submit a certification to the required subcontractor's insurance when requested by the Contract Administrator. In lieu of the above the contractor can name all subcontractors on its policy as additional insured as approved by the County.

Section 2.10. WORKERS' COMPENSATION AND EMPLOYEES' LIABILITY INSURANCE

In accordance with Section 3700 of the Labor Code, the Contractor, and each subcontractor, shall secure the payment of workers' compensation to its employees as specified in the Agreement for Construction.

In the event that there is any employee working on the Project who is not protected under the Workers' Compensation statute for any reason, including because he is engaged in hazardous work, the Contractor shall provide, and shall cause each subcontractor to provide, adequate insurance for the protection of such employee. Such insurance shall comply with all requirements of the Labor Code.

Section 2.11. POSTING AT SITE.

The Contractor shall post, and cause all subcontractors to post, in a conspicuous place on the Project Site, a statement as required by Labor Code Section 3550, stating the name of the employer's compensation insurance carrier or that the employer is self-insured, and who is responsible for claims adjustment.

Section 2.12. EFFECTIVE DATE OF POLICIES.

The insurance required by this Article shall be in full force and effect at all times during prosecution of the Work and until the final completion and acceptance thereof by County, and every policy shall state that it shall not be assigned, canceled or reduced in coverage without thirty (30) days' prior written notice to County.

ARTICLE 3.

INITIAL SUBMITTALS AND TIME OF WORK

Section 3.01. PROGRESS SCHEDULE AND SCHEDULE OF VALUES.

A. **Progress Schedule**. No later than thirty-five (35) calendar days following the Award of the Contract by the County and before issuance of a Notice to Proceed, the Contractor shall submit to the Contract Administrator a schedule showing the date on which work will commence on each part or class of the Work described with reference to the Divisions in the Technical Specifications and the responsible subcontractor(s); estimated dates of completion of such parts or classes; the working days proposed for work, and the approximate percentage of Work scheduled for completion at any time. Critical path sequencing items shall be identified. The Progress Schedule shall be practicable and consistent with the time requirements of the Agreement.

When requested by the Contract Administrator, or when the Contractor requests a Contract Time Extension Change Order, the Contractor shall submit a revised Progress Schedule showing changes to the originally approved Schedule necessary to complete the Work within the requested Contract Time.

B. **Schedule of Values**. Simultaneously with the Progress schedule, the Contractor shall submit a Schedule of Values, showing a breakdown of the Contract Price with reference to the parts or classes or work shown on the Progress Schedule, and with reference to the Divisions in the Technical Specifications.

This schedule shall include products and materials allocated to each Allowance specified by the Contract Documents.

When requested by the Contract Administrator, or when the Contractor requests a Contract Price adjustment, the Contractor shall submit a revised Schedule of Values incorporating the requested Price adjustment(s).

Section 3.02. INITIAL SUBMITTALS.

No later than thirty-five (35) calendar days after the Award of the Contract by the County, and before issuance of a Notice to Proceed, the Contractor shall make the following initial submittals:

A. **Schedule of Unavailable Materials**: A schedule showing any materials called for in the Contract Documents which are not obtainable for installation in the Project within the time limits set forth in the Progress Schedule, and the reasons known to Contractor for the unavailability.

The schedule shall detail Contractor's efforts to obtain the materials in question.

B. **Schedule of Substitutions**: Contractor shall submit a schedule of all proposed Substitutions. The request for Substitutions shall in all respects comply with Article 7 of these General Conditions and shall include all requests for Substitutions of "an equal" item as defined by Public Contracts Code Section 3400 and Sections 7.02 and 7.03 hereof.

Failure to indicate such requested Substitutions on this schedule shall be deemed a waiver of the request for Substitution.

C. **Schedule of Items Requiring Long Order Lead Time**: Contractor shall submit a schedule of all materials, the delivery of which will require more than 50% of the total Contract Time. The dates

shown on this schedule shall be consistent with the Progress Schedule, and the Schedule shall specify the dates of order and expected delivery dates for the specified materials.

D. **Subcontractor Insurance**:

1. **First-Tier Subcontractors:** The Contractor shall submit certificates of insurance for liability and workers' compensation insurance for all first-tier subcontractors, as required by Article 2 hereof. The County reserves the right to examine copies of the subcontractors' insurance policies.

2. **Lower-Tier Subcontractors**: If requested by the Contract Administrator, Contractor shall submit certificates of liability and workers' compensation insurance for any or all lower-tier subcontractors. The County reserves the right to examine copies of the lower-tier subcontractors' insurance policies.

E. **Subcontractors: Allocation of Work**: Contractor shall submit a chart showing all first and lower-tier subcontractors, and the contractual relationships between them, and identifying the Work to be done by each.

F. **Schedule of Submittal Dates**: Contractor shall submit a schedule indicating the dates upon which all required submittals will be submitted. Such schedules shall conform to Section 5.02 of the General Conditions and shall include all submittals required by the Contract Documents.

Section 3.03. APPROVAL OF INITIAL SUBMITTALS; EFFECT.

Prior to issuance of a Notice to Proceed, the Contract Administrator shall act upon the initial submittals required by Section 3.02.

The time for the Contract Administrator's action shall be twenty-one (21) days or less, from the date Contractor delivers submittals that conform to the Contract Documents.

In the event the Contract Administrator rejects an initial submittal, the Contractor shall not be entitled to any Contract Time extension on account of delay associated with re-submittal and re-approval. The County reserves the right to reject initial submittals in whole or in part, and the Contractor shall correct the submittal to comply with the Specifications and any requirements noted by the Contract Administrator in rejecting the submittal before issuance of a Notice to Proceed.

Once approved, all initial submittals shall be incorporated as part of the Agreement and Contractor shall comply therewith. The Contract Administrator is authorized to approve revisions to the Progress Schedule or Schedule of Values as required to incorporate approved changes in the Contract Time or Price.

Failure to meet the approved Progress Schedule is grounds for withholding Progress Payments pursuant to Article 23.

Section 3.04. COMMENCEMENT AND PROSECUTION OF WORK.

The Contractor shall not commence nor allow any subcontractor to commence work before receiving a Notice to Proceed from the County, specifying the day work is to commence. The Contractor shall commence work on such day, and shall prosecute the Work diligently to completion thereafter, at a rate that meets or exceeds the approved Progress Schedule.

Section 3.05. OTHER SUBMITTALS.

The Contractor shall make all submittals specified by the Technical Specifications for all Work to be done in the first sixty (60) days after issuance of the Notice to Proceed.

Section 3.06. TIME OF ESSENCE.

Time is of the essence of the Agreement for Construction.

Section 3.07. DATE OF COMPLETION.

The Contractor obligates himself to make the whole Work fully complete and satisfactory on or before the completion date specified in Section 2 of the Agreement for Construction, plus any Contract Time extensions approved by Change Order. The date of completion is the date of recordation of the Notice of Completion pursuant to Section 25.04; provided, however, that the date of completion for purposes of determining whether the Contractor has completed the Work within the time required by the Agreement for Construction shall be deemed to be the date the Contractor filed the "Contractor's Request for Final Payment" pursuant to Section 25.01 if, and only if, the Work was in fact fully complete and in full conformity with the Contract Documents when the Contractor's request was filed.

Section 3.08. EXTENSION OF TIME; UNAVOIDABLE DELAYS.

The Contractor shall not be granted a Contract Extension except on the issuance of a Change Order by the County Administrator, upon a finding that the delay in completion was unavoidable.

Delays in prosecution of parts or classes of the Work that are not demonstrated to prevent or delay completion of the entire Project within the Contract Time are not "unavoidable delays" for purposes of this section.

In all cases, the time authorized for extension of the Contract Time shall be no greater than the number of days directly attributable to the unavoidable delay which caused delay in the completion of the Project. "Unavoidable delay" for this purpose shall be defined as follows:

A. **Unavailable Materials.** That materials or articles called for in the Contract Documents are not obtainable within the time required for timely completion; provided that such materials or articles were listed by the Contractor in the schedule required by Section 3.02 hereinabove; that the Contractor demonstrates that the unavailability of the materials is in fact the cause for the delay, and could not have been cured by adjusting the Progress Schedule; and that the unavailability of such materials is due to circumstances beyond the Contractor's control. If good cause for a delay is demonstrated pursuant to this subsection, the County, at its sole discretion, may grant a time extension or apply Section 17.09 hereof.

B. **Force Majeure**. That delays in construction have resulted from circumstances beyond the control of the Contractor and which the Contractor could not have provided against by the exercise of reasonable care, prudence, foresight, and diligence. Unavoidable delays within the meaning of this subparagraph shall be those caused by acts of neglect of the County or its officers, agents, or employees; by acts of God, war, insurrection, civil disorder, fire, floods, epidemic, or strikes.

C. **Unseasonable Weather**. An extension of time may be granted due to weather which is unsuitable for the Work currently in progress, upon the findings that the weather conditions in fact caused the delay in completion of the Project and that such weather conditions were not, and could not in the exercise of reasonable diligence, have been foreseen by the Contractor.

Unseasonable weather that, in the exercise of reasonable foresight and diligence, should be expected in the area at the time of year in question is not cause for an extension of time.

D. **Time Extension Due to Change Orders or Work Authorizations**. A time extension may be granted due to a delay in the Project caused by the approval by the County of a Change Order or Work Authorization pursuant to Article 17. The Contractor shall be entitled to a time extension Change Order only when the extra work is demonstrated by the Contractor to have caused a delay in the Project. When a Work Authorization is issued, the Contract Administrator or County Administrative Officer is authorized to approve an allocation of time attributable to that Work Authorization. Approval of such allocation shall not constitute County's approval of a time extension to the overall Contract time but shall constitute County approval of the time allocated by the Contractor to perform the particular extra work in question.

The provisions of Sections 3.08 and 3.09 shall be applicable to requests for time extensions due to extra work.

The Contract Administrator may cumulate requests for time extensions due to Work Authorizations and process periodic Change Orders therefore, if warranted, or may process a Contract Time Extension Change Order simultaneously with the Contract Price Change Order, in their sole discretion.

E. **Delay Due to Rejected Submittals**. In the event the Contract Administrator rejects a submittal, the Contractor shall not be entitled to any Contract Time extension on account of delay associated with re-submittal.

The procedure for submittals shall be as specified in Articles 5 and 7 (Substitutions) and the Technical Specifications. The Contract Administrator shall approve or reject submittals within twenty-one (21) days of the Contractor's delivery of the submittal, unless a different time is specified in the Technical Specifications for the particular submittal in question.

F. **County Caused Delays**. In the event that the Project is delayed by acts of the County not authorized by the Contract Documents which the Contractor demonstrates will or have caused an unavoidable delay as defined by Subparagraph "B", the Contractor shall be entitled to a Contract Time and/or Contract Price Change Order to offset the extra time and/or costs incurred by the Contractor. Such extra costs shall be limited to those "actual costs" as defined in Section 17.02-D directly caused by the delay and incurred on this Project only. Overhead and profit shall be limited to that specified in Section 17.02-C hereof. Extra costs shall not include indirect costs nor loss of profits or increased costs on other work. Extra time shall be limited to that directly caused by the delay, as defined in Subparagraph "B" hereof.

The Contractor specifically agrees that a time extension and cost adjustment as provided herein is its sole remedy for County-caused delays and agrees to make no claim or demand for additional damages, nor claim an acceleration of the time for performance.

The Contractor shall not be entitled to any Contract Time Extension nor Contract Price adjustment for alleged County delays if the County has acted within the time limits specified by the Contract Documents.

The Contractor shall not be entitled to any cost adjustment for delays except for County caused delays as specified in this subsection.

Section 3.09. NOTICE OF DELAYS; SUBMITTALS.

Whenever the Contractor foresees any delay in the prosecution of the Work, and in any event immediately upon the occurrence of any delay which the Contractor regards as grounds for an extension and/or cost adjustment as specified in section 3.07., the Contractor shall notify the Contract Administrator in writing of the delay. Such notification shall specify with detail the cause asserted by the Contractor to constitute grounds for an extension, and/or cost adjustment. Failure of the Contractor to submit such a notice within five (5) days after the initial occurrence of the event giving rise to the delay shall constitute a waiver by the Contractor of any request for a time extension and/or cost adjustment, and no extension and/or cost adjustment shall be granted as a consequence of such delay.

With its request for time extension and/or cost adjustment, the Contractor shall submit evidence to demonstrate that the delay in prosecution in the work will result in an unavoidable delay in completion of the entire Project. Such evidence shall include a demonstration that the delayed portion of the Work will affect the critical path scheduling of the entire Project. The Contractor shall also submit a proposed revised Project Schedule, which accounts for the delay in completion of the entire Project caused by the delay in prosecution of part of the Project, and includes a revised critical path demonstrating how the Project will be completed within the proposed revised Contract Time.

Section 3.10. INVESTIGATION; PROCEDURE.

Upon receipt of a request for a Contract Time extension and/or cost adjustment, the Contract Administrator shall conduct an investigation of the facts asserted by the Contractor to constitute grounds for an extension and/or cost adjustment. The results of this investigation shall be reported by the Contract Administrator to the Contractor and the Contract Administrator shall indicate whether he will recommend for or against such extension.

The Contract Administrator may, in his sole discretion, defer this recommendation to allow the accumulation of time extensions and/or cost adjustment due to Work Authorizations into a periodic or final Change Order request.

If the Contract Administrator disallows the request, there shall be no allowance made for the time during which the request was pending, and the Contractor shall remain obligated to complete the Work in the time specified.

If the Contract Administrator approves the time extension change order, the new Progress Schedule submitted by the Contractor and approved by the County shall be deemed to amend the original Progress Schedule approved by the County pursuant to Section 3.03 hereof; thereafter, the amended Progress Schedule shall have the same force and effect as the originally approved Progress Schedule.

The Contractor agrees that the determination of the Contract Administrator as to whether grounds for an extension and/or cost adjustment exist, and if so, the duration of the extension and/or cost adjustment, shall be final and binding upon both County and Contractor.

Section 3.11 DISCRETIONARY TIME EXTENSION FOR BEST INTEREST OF COUNTY.

The County reserves the right to extend the Contract Time for completion of the Work if the County Administrator determines that such extension is in the best interest of the County.

Section 3.12. LIQUIDATED DAMAGES.

If the Work is not completed by Contractor in the time specified in Section 2 of the Agreement for Construction or within any period of extension authorized pursuant to this Article, the Contractor acknowledges and admits that the County will suffer damage, and that it is impracticable and infeasible to fix the amount of actual damages. Therefore, it is agreed by and between the Contractor and the County that the Contractor shall pay to the County as fixed and liquidated damages, and not as a penalty, the sum specified in the Agreement for Construction for each calendar day of delay until the Work is completed and accepted, and that both the Contractor and the Contractor's surety shall be liable for the total amount thereof, and that the County may deduct said sums from any monies due or that may become due to the Contractor.

This liquidated damage provision shall apply to all delays of any nature whatsoever, save and except only unavoidable delays approved by the Contract Administrator pursuant to Section 3.07 hereinabove.

The Contractor also acknowledges that the contract completion date for purposes of liquidated damages shall be the date of the Board of Supervisors' Resolution of Acceptance, unless Section 3.06 applies.

Section 3.13. EXTENSION OF TIME NOT A WAIVER.

Any extension of the Contract Time granted pursuant to this Article shall not constitute a waiver by the County, nor a release of the Contractor, from his obligations to perform this Contract in the Contract Time.

Granting of a time extension due to one circumstance on one request therefore shall not constitute a granting by the County of an extension of time for any other circumstance or the same circumstance occurring at some other time, and shall not be interpreted as a precedent for any other request for extension.

Section 3.14. SUSPENSIONS EXCEEDING ONE YEAR.

Should the Work be suspended for a period exceeding one (1) calendar year due to war conditions, labor conditions, legal actions, or for other conditions constituting the legal defense of impossibility of performance, the Contract and the County agree to enter an agreement terminating the Agreement for Construction upon the following terms and conditions:

The County shall be responsible only to pay the Contractor the actual value of the completed Work, to the County, less progress payments made to date, less any deductions authorized by the Contract Documents, and plus the ten (10%) percent withhold from previously issued progress payments.

As between the Contractor and the County, it shall be conclusively presumed that the actual value to the County for the Contractor's Work to the date of the last progress payment is not more than the actual amount of progress payments made to date plus the ten (10%) percent withhold from such progress payments; provided, however, that this section shall not preclude the County from deducting charges for work or materials which do not meet the requirements of the Contract Documents.

Such final payment shall be due only after any stop notices are resolved or the time to file stop notices has expired.

Section 3.15. EFFECT OF STOP WORK NOTICE.

If the County orders a suspension of the Work pursuant to Section 18.05, the days on which the suspension is in effect shall be included in determining the required completion date and shall not otherwise modify or extend the time within which the Contractor is to perform. In such event, the Contractor shall not be entitled to any damages or compensation on account of such suspension or delay, and the suspension and/are delay shall not constitute an acceleration of the performance time.

If the Contract Administrator determines that the Work conforms in all respects to the Contract Documents and releases the Stop Work Notice, the Contractor shall recommence work and may thereafter request a time extension pursuant to Section 3.07-F hereof. Sections 3.07, 3.08, and 3.09 shall apply to such requests.

ARTICLE 4.

SCOPE AND INTENT OF CONTRACT DOCUMENTS; CLARIFICATIONS

SECTION 4.01. BASIC INTENT AND SCOPE OF CONTRACT DOCUMENTS.

The basic intent of the Contract Documents is to describe the complete Project, including all materials, labor, equipment, and incidentals necessary for the proper execution and full completion of the work. The scope of the Agreement for Construction shall include everything directly called for by the contract Documents, and all work reasonably to be foreseen and/or inferred by competent contractors of the various required trades in order to completely perform the Work to produce the complete Project as intended.

The Agreement for construction does not recognize "substantial performance" as equivalent to "complete performance"; by entering the agreement, the contractor agrees, as a material covenant, to provide "complete performance" within the contract Time, for the amount included in the Contractor's bid as the Contract Price, unless modified by Change order. No extra compensation shall be allowed for any work or materials not directly appearing in the Contract Documents, but which a competent contractor should have foreseen and/or inferred would have been within the scope of the Agreement for Construction for work of the type and in the area of the Project. Even though items of work are not separately mentioned in the contract Documents, the Scope of the Agreement includes the furnishing and installation of all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for the sound, secure and fully complete performance of the work.

The Contract Price shall include all compensation for furnishing all labor, materials, tools, equipment and incidentals, and doing all work necessary fully to complete the Project as intended.

Section 4.02. HARMONIZATION OF CONTRACT DOCUMENTS.

The Contract Documents are complimentary, and what is required by anyone shall be as binding as if required by all. The Contract Documents are intended to be coordinated to describe and provide for the complete Project. However, where conflicts exist between the CONTRACT DOCUMENTS, such conflicts shall be clarified to the following order, the first taking precedence over the lower ranked:

CONTRACT CHANGE ORDERS
ADDENDA
SPECIAL PROVISIONS
TECHNICAL SPECIFICATIONS/PROVISION
CONTRACT DRAWINGS
CONSTRUCTION AGREEMENT (CONTRACT)
NOTICE TO BIDDERS
GENERAL CONDITIONS
STANDARD CONSTRUCTION SPECIFICATIONS
CONTRACTOR'S PROPOSAL BID

Scale drawings, full sized details, and technical specifications are intended to be coordinated and to agree fully. unless specifically noted otherwise in the Technical Specifications, all work and materials necessary for each unit of construction, even though only briefly mentioned or indicated, shall be furnished and installed fully and completely as specified in accepted submittals and the manufacturers' instructions and/or recommendations.

For convenience, the Specifications and Drawings in the Contract Documents are arranged in several sections, but such separation shall not be considered as the limits of the Work required by any separate trade. The terms and conditions of the Work to be performed by any subcontractor are strictly between the Contractor and such subcontractor.

Section 4.03. LOCATIONS.

The locations of equipment, wiring, piping, and similar materials and equipment are shown diagrammatically in the Contract Documents; actual Site conditions may not always permit their installation precisely in the location shown on the Contract Drawings. Contractor shall coordinate installation of equipment.

Section 4.04. SITE CONDITIONS.

Where investigations have been conducted by the County of existing conditions on the Site including subsurface conditions, such investigations are made for the purpose of design only and for the information of bidders. The results of such investigations represent only the statement by the County as to the circumstances and character of materials actually encountered by the county during the investigations. The County makes no guarantee or warranty, express or implied, that the conditions indicated are representative of conditions existing throughout the Site of the Project or any part of it, or that unanticipated conditions might not occur.

All excavation work shall be performed on an "unclassified basis; that is, shall include the removal of all material encountered including earth or rock formations, regardless of type or hardness thereof or groundwater conditions in the excavation, the cost of such excavations being included in the Contract Price at the time of bidding. Unclassified excavation work does not include drilling or blasting operations, unless otherwise specified in the Technical Specifications.

Section 4.05. PROJECT RECORD DOCUMENTS.

The Contractor shall maintain at the Site such Project record documents as are required by the Contract Documents.

At a minimum, the Contractor shall maintain one record copy of all drawings, specifications, addenda, work authorizations, change orders and other modifications, in good order and marked currently to record all changes made during construction, and accepted submittals.

With his request for final payment, the Contractor shall submit such record drawings to the Contract Administrator for approval. The contractor shall make all corrections necessary to produce accurate and complete record drawings showing the "as-built" Project.

The Project Record Documents shall be kept accurately and currently to show the precise locations and depths below finish grade of all components of the Project, as constructed.

Section 4.06. CONTRACTOR'S SUPERVISION AND COORDINATION OF THE WORK.

It is the Contractor's basic responsibility to execute and complete the Work necessary to construct the Project as intended by the Contract Documents, whether the Work is being performed directly by the Contractor, or by subcontractors of the Contractor. In all cases, the Contractor shall cooperate reasonably and in good faith with the Contract Administrator to the end that unnecessary Clarification requests are avoided, and the Work flows smoothly to a fully completed Project for the Contract Price, within the Contract Time.

The Contractor is responsible to thoroughly review and become familiar with the Contract Documents, and to identify conflicts, internal inconsistencies and/or ambiguities claimed by the Contractor to exist in the documents. By execution of the Agreement for Construction, the Contractor represents that it is fully competent, skilled and experienced to secure the performance of all Work needed to complete the Project intended and will utilize fully such competence, skill, and experience in interpreting the Contract Documents to produce the results intended. Prior to requesting a Clarification, the Contractor shall exert its best efforts to resolve problems in the field.

The Contractor is responsible to supervise and coordinate the work of all subcontractors. The Contractor shall exert its best efforts to resolve problems presented by Subcontractors.

The Contract Administrator shall consider no request by Contractor for a Clarification on its own behalf or on behalf of a subcontractor unless the request details the Contractor's efforts to resolve the issue, the results thereof, and demonstrate that the Contractor's efforts comply herewith. In all such cases, the Contract Administrator reserves the right to require the Contractor to make additional efforts to resolve the issue rather than issuing a Clarification.

Section 4.07. CLARIFICATIONS AUTHORIZED.

The Contract Administrator is authorized to furnish during the progress of the Work such Clarifications as the Contract Administrator deems are necessary to make clear and to define in greater detail the intent of the Contract Documents. Such Clarifications shall be incorporated by reference into the contract Documents, and the Contractor shall make his Work conform to all such Clarifications. In the event of conflict between the original Contract Documents and subsequently issued Clarifications, the Clarification most recently issued shall control.

Section 4.08. CLARIFICATIONS; PROCEDURE.

A. **Contract-Initiated Requests.** Should the Contractor discover any conflicts or errors in the Contract Documents, or have any question concerning interpretation or clarification of the Contract Documents; or if it appears to the Contractor that the Work to be done or any matters relative thereto are not sufficiently detailed or explained in the Contract Documents; and provided that the Contractor has exerted its best efforts to interpret the Contract Documents and resolve the issue as required by Section 4.06; then before proceeding with the Work affected, the Contractor shall notify the Contract Administrator and request a Clarification.

The Contractor's request for Clarification shall be in writing, accompanied by sketch drawings and the materials necessary to explain and illustrate the problem in detail, and shall explain the Contractor's previous efforts to resolve the issue and the results thereof.

If the Contractor has proceeded with Work which was eligible for a clarification, but regarding which the Contractor failed to request a clarification, the Contractor shall not be entitled to, nor shall it request, any adjustment to the Contract Price or Time, caused by or resulting from such Work. The Contractor proceeds with such Work at its own risk, and shall make good any resulting damage, defect or extra work produced by such work.

B. **County-Initiated Clarifications**. At any time, the Contract Administrator may issue Clarifications to explain the Work more fully. The Contractor shall perform the Work as required by the Clarification.

C. **Incorporation in Contract**. All duly issued Clarifications shall become part of the Contract Documents upon delivery to the contractor.

D. **Procedure for Extra Work Claims**. If the Contractor contends that any clarification requires Work beyond the Scope of the Agreement, the procedures in Section 17.05 shall be followed.

Section 4.09. CONTRACT ADMINISTRATOR'S INVESTIGATION AND RESPONSE TIME.

Upon receipt of Contractor's request for a Clarification, the Contract Administrator shall conduct such investigations as he deems appropriate, including consultation with the Project Architect as necessary to decide the Contractor's request for Clarification.

In all cases, if the request is incomplete or does not demonstrate the Contractor's compliance with this Article, the Contract Administrator may reject the request unprocessed, and return it to the Contractor. There shall be no time extension on account thereof.

Within fourteen (14) days following receipt of the Contractor's fully documented request for Clarification, the Contract Administrator shall issue his written response to the Contractor. If the Contract Administrator rejects the Contractor's request for Clarification, the Contractor shall perform the Work in accordance with the Contract Documents.

If the contract Administrator issues a Clarification, the Contractor shall perform the Work in accordance with the Clarification.

Section 4.10. DISPUTE AS TO SCOPE OF CONTRACT DOCUMENTS.

If the Contractor contends that any Work required by a clarification is outside the Scope of the Contract Documents as specified in section 4.01, the Contractor shall, within five (5) days of receipt of the Clarification, submit a written request for a Change Order to the Contract Administrator.

Such request shall specify all details of why the Contractor contends that the Work exceeds the Scope of the Contract Documents, and shall include an estimate by the Contractor of the cost to perform the Work, which complies with Section 16.05 hereof, and of the time to perform the Work, which complies with Section 3.08 hereof.

Upon timely delivery of a request by the Contractor, the Contract Administrator shall, within fourteen (14) days, consult with the Project Architect, as needed, and respond to the Contractor's request.

Such response shall either confirm the original Clarification, as within the scope of the work, and order the Work to be performed with no extension of time or increase in contract amount, or approve the Contractor's request, in which case a work Authorization will be issued, if authorized by Section 16.03 hereof, or Change Orders will be processed to adjust the Contract Price and/or Time equitably.

The Contractor acknowledges that the purpose of this Section is to allow the County advance Notice of Contractor's contention that a Clarification is beyond the Scope of the Agreement, so that the County may reconsider the Clarification before the Clarification Work is incorporated in the Project and such reconsideration is futile. Therefore, the Contractor agrees that if it proceeds with such Work without providing such Notice or before the Contract Administrator's response, the Contractor does so at its own risk and cost. Extra costs and/or time caused by or resulting from such Work shall be at the Contractor's expense, and the Contractor shall make good any resulting damage, defect, or extra Work produced by such Work.

ARTICLE 5.

SUBMITTALS.

Section 5.01. REQUIRED SUBMITTALS; TIME.

No portion of the Work requiring submittals shall be commenced until the submittal has been accepted by the Contract Administrator. Should the Contractor proceed with any work requiring a submittal before acceptance thereof, the Contractor shall remove and replace any Work which is not in accordance with the Contract Documents and shall bear the risk of loss due to resulting damage, defects, or added costs.

The Contractor shall provide all submittals required by the Technical Specifications in accordance with the procedures set forth in the Contract Documents 1.

All submittals shall be complete in every respect and shall include all information required both by the particular Technical Specification section and the Contract Documents.

The Contract Administrator shall not process submittals that are not complete in all respects, legible, reproducible, and sufficiently dimensioned and detailed to demonstrate compliance with the Contract Documents.

The Contract Administrator may reject all or any portions of a submittal which fails to comply with the Contract Documents, and the Contractor shall resubmit the entire submittal or the rejected portion, whichever is ordered by the Contract Administrator.

The Contractor shall be entitled to no Contract Time or Price adjustment for delays occasioned by the failure of the Contractor's submittals to comply with the Contract Documents.

Section 5.02. TIME FOR SUBMITTALS.

A. Time Generally. All submittals shall be submitted by the Contractor at the time specified by the Contract Documents, and the applicable portions of the Technical Specifications; provided, however, that in all events, Contractor shall submit all submittals so as not to cause a delay in the Work, including a reasonable time for review by the Contract Administrator. Unless otherwise specified in the Technical Specifications, the time for review by the Contract Administrator shall be no more than twenty-one (21) days.

B. **Submittals within Twenty-One (21) Days Following Notice to Proceed**. Within the first twenty-one (21) days following issuance by the County of a Notice to Proceed, the Contractor shall make the following submittals, including all information required by the General Conditions, Section 01340 of Division 1, and all other the applicable Technical Specifications:

1) All data required by the Contract Documents to substantiate a Request for Substitution.

2) Proposed substitutions, with all substantiating data, for all materials listed as "unavailable materials" on the Contractor's initial submittal, pursuant to Section 3.02-A hereof.

3) A critical path schedule, if required by the Contract Documents.

4) Any other submittals requested by the Contract Administrator to be received within the first 21 days following issuance of a Notice to Proceed.

C. **Submittals After 21 Days Following Issuance of the Notice to Proceed**: All other submittals required by the Contract Documents shall be submitted in conformity with the time requirements thereof, and in no event later than specified on the schedule of submittals approved pursuant to Section 3.02-G hereof.

Section 5.03. CONTRACTOR'S RESPONSIBILITIES REGARDING SUBMITTALS.

The Contractor shall review and approve all submittals, including those originating with subcontractors and suppliers, before submitting them to the Contract Administrator.

By making a submittal, the Contractor represents that it has determined and verified all materials, field measurements, and field construction criteria related thereto, and that it has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

It is the Contractor's responsibility to specifically point out any variation or discrepancy between submittals and the Contract Documents, or between a re-submittal and the notations on the original Submittal. The Contractor shall make specific mention of all such variations, along with an explanation of why they are requested, in his letter of transmittal.

Failure by the Contractor to identify in his letter of transmittal with the submittal any variation, discrepancy, or conflict with the Contract Drawings shall render acceptance of the submittal null and void, and the Contractor shall bear all risk of loss and reconstruction costs or delays.

The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Contract Administrator's action on a submittal unless the contractor has complied with this section and the Contract Administrator expressly authorizes such deviation.

If any plumbing, mechanical, electrical, or structural modifications are required as a result of submittals that do not comply with the Contract Documents, such modification shall be made without extra cost to the County, and without extension of the Contract Time.

Section 5.04. ACTION ON SUBMITTALS.

The Contract Administrator shall take one of the following actions on a submittal:

"APPROVED": Fabrication, manufacture, or construction may proceed providing submittal complies with Contract Documents.

"APPROVED AS NOTED": Fabrication, manufacture, or construction may proceed providing submittal complies with Project Architect's notations thereon and Contract Documents. If for any reason the Contractor cannot comply with notations, the Contractor shall resubmit as described for submittals stamped **"REVISE AND RESUBMIT"**.

"REVISE AND RESUBMIT": Submittal does not comply with Contract Documents, and fabrication, manufacture, or construction shall not proceed. The Contractor shall make a new submittal conforming to the Contract Documents. Submittals stamped **"REVISE AND RESUBMIT"** shall be attached as an Exhibit to the re-submittal(s) for the specified items.

"NOT APPROVED": Fabrication, manufacture, product and/or construction does not conform to Contract Documents. Such fabrication, manufacture, product or construction shall not proceed and

are not permitted on the site. The Contractor shall make a new submittal, including a new proposed for fabrication, manufacture, product and or construction conforming to the Contract Documents.

"NO ACTION REQUIRED: Submittal is not required by this contract for this material or product. If Contractor wishes comment on this particular material or product, a submittal of a letter from Contractor explaining his purpose for submittal should accompany any future submittal.

Approval is only for conformity with the Design concept of the Project and compliance with the intent of the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

Section 5.05. EFFECT OF ACCEPTANCE OF SUBMITTALS.

The acceptance of submittals shall not relieve the Contractor of any obligation for quantities, accuracy of dimensions and details for property coordination, fitting and construction of the Work; for errors or omissions in the submittals; for conforming the Work to the requirements of the Contract Documents and all applicable laws and regulations; or from responsibility to fulfill the Contract at no extra cost to the County, within the Contract Time.

The County will review submittals for conformity with the Contract Documents, and acceptance thereof operates only with reference to such conformity. The County will attempt to discover errors, but the responsibility for accuracy and completeness of all submittals is the Contractor's.

After a submittal has been accepted, the Work shall proceed in accordance therewith.

The acceptance of samples provided with submittals shall be for the characteristics thereof, for the uses named in the action on the submittal, and for no other. Acceptance of samples shall not constitute a modification in any requirement of the Contract Documents unless expressly so noted, nor shall it relieve the Contractor of its obligation fully to perform the Agreement for Construction. All material or work installed after acceptance of a sample shall be equal or better than the sample in all respects.

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ARTICLE 6.

MATERIALS; STORAGE; PAYMENT; CERTIFICATIONS.

Section 6.01. QUALITY OF MATERIAL AND PRODUCTS.

The Contractor shall, if required by the Contract Administrator, furnish satisfactory evidence as to the kind and quality of materials provided in addition to the submittals required by the Technical Specifications.

The Contract Administrator may require, and the Contractor shall submit, a list designating the source of supply of each item of material entering into the Construction of the Work, and in such event, such materials or products shall not be delivered to the Work nor installed therein until after the Contract Administrator has approved such list.

Section 6.02. BETTER MATERIAL OR PROCESS.

In the Event that Contractor furnishes a material, product, process or article better than that specified in the Contract Documents, the difference in cost of such material, product, process or article shall be borne by the Contractor, unless the County previously specifically authorized the use of such item and a Contract Price adjustment therefore.

Section 6.03. INDUSTRY STANDARDS.

Unless otherwise specified in the Technical Specifications:

A. Any material specified by reference to a number, symbol or title or a specified standard such as a Commercial Standard, a Federal Specification, a Trade Association Standard, or other similar standard, shall comply with requirements in the latest revision thereof including any amendments or supplement thereto, in effect on the date of the Contractor's Bid, except as limited to type, class or grade, or modified in such reference.

B. The standard referred to, except as modified in the Specifications, shall have full force and effect as though printed in these Specifications. These standards are not specified in detail for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements.

1) Where Federal Specifications are referred to as a measure of quality and standard, they refer to Federal Specifications established by the Procurement Division of the United States Government and are available from the Superintendent of Documents, U.S. Government Printing Office.

2) Where Federal Specification numbers are used, they refer to the latest edition including amendments thereto.

3) Where Commercial Standards or Product Standards are referred to as a measure of quality, standard and method of fabrication, they refer to Commercial Standards and Product Standards issued by the U.S. Department of Commerce.

4) Where industry standards numbers are used, they refer to the latest tentative specifications, standards specifications, standards method or standard methods of testing, issued for example by the American Society for Testing Materials, unless specifically noted.

See Section 01 42 13 - Standard Abbreviations and Symbols for details on Abbreviations and Symbols.

Section 6.04. MATERIALS AND PRODUCTS STORAGE.

The Contractor shall confine the storage of all materials, products and equipment required in the performance of the Work to the area specified on the contract Drawings.

The County reserves the right, at the sole discretion of the Contract Administrator, to require materials to be stored off the Site in a bonded warehouse or other approved location. The County shall provide such location free of charge to the Contractor, or the Contractor shall be entitled to a Contract Price change order to off-set the actual cost thereof as defined in Section 17.02-D. Contractor shall not be entitled to overhead and profit on the rent of such facility.

The Contractor is admonished that the County has no obligation to provide a secure warehouse or other storage facilities; the Contractor takes the sole risk of loss or vandalism to any products or materials stored anywhere other than in a warehouse provided by the County.

All materials and products shall be stored in accordance with their manufacturers' instructions, with seals and labels intact and legible.

All materials, supplies and equipment to be incorporated in the Work shall be new, unless otherwise specified; of the type, capacity and quality specified; and free from defects. All materials shall remain in their original packages or containers until ready for use. The labels of all packages or containers shall remain affixed and shall be kept legible.

The Contractor shall protect the Work, materials and equipment from damage due to action of the elements, trespassers, and other causes. It shall properly store materials and equipment and, when necessary or when specified by the Technical Specifications, erect such temporary structures as is required to protect them from damage.

Section 6.05. TIME FOR DELIVERY OF MATERIALS: EARLY DELIVERY.

A. **Basic Requirement:** Unless early delivery is authorized by the Contract Administrator pursuant to Subsection B. hereof, the Contractor shall limit delivery of materials and equipment to the Site to those materials and/or equipment needed for installation within thirty (30) days of the date of delivery. The Contract Administrator shall refuse payment for materials delivered to the Site that are not intended to be used within thirty (30) days of the date of delivery.

B. **Early Delivery of Materials:** The County reserves the right to allow an earlier delivery date of any materials and/or equipment. Upon inspection and approval as specified below, the Contractor shall be entitled to progress payments therefore as specified in Section 23.01.

Upon application by the Contractor, the Contract Administrator, in his sole discretion, may authorize early delivery of materials and/or equipment, and payment therefore, subject to the following requirements:

1. For purposes of this Section, "materials and equipment" eligible for payment are defined as finished goods made specifically for the Project and requiring extensive time to be manufactured or obtained. Raw materials or work in progress and not yet delivered to an approved storage location are not eligible for payment. Finished items that are readily available for purchase are not eligible for payment.

2. The Contractor's request shall demonstrate that the proposed early payment is in the best interest of the Project by accomplishing time and/or money savings.

3. In his application for payment for such materials, the Contractor shall separately list the items for which payment is sought pursuant to this subsection. No payment shall be authorized unless the Contractor demonstrates that he is the unconditional owner of the equipment or material and executes a transfer of title to such equipment or material to the County with each request for early payment.

4. The materials for which a progress payment has been received shall be fully insured, with the County named as co-insured, segregated from the manufacturer's other work in progress and raw materials at the manufacturer's place of storage, and separately identified as being the property of the County of Yolo. Such insurance shall be primary, and the County's Builders' Risk insurance secondary.

5. The County retains the right to conduct inspections of such materials either during fabrication or during storage, at the manufacturer's plant or place of storage. The Contractor shall retain all risk of loss for such materials, however.

6. Payments for such materials shall be due only after such materials have either been delivered to the job site or to a storage location acceptable to the County, except that such payments shall not be included in the value for work in place for the purpose of calculating payments for labor and mark up.

7. The County reserves the right to specify requirements in addition to those stated above regarding early payment for materials. Such requirements shall be listed on the Contract Administrator's consent for early payments; the Contract Administrator hereby is authorized to provide such consents, with additional requirements, as are deemed necessary to protect the County.

Section 6.06. SPARE PARTS AND MAINTENANCE MATERIALS.

The Contractor shall provide spare parts and maintenance materials as required by the Technical Specifications.

Section 6.07. PROVIDING AND PAYING FOR MATERIALS, ETC.

Except as otherwise specifically stated in the Contract Documents, Contractor shall provide and pay for all materials, products, articles, processes, tools, equipment, and installation, and all associated superintendence of every nature whatsoever necessary to execute and complete the Work within the specified time.

Section 6.08. WARRANTY OF TITLE.

No material, article, product, supplies, or equipment for the Work under this Agreement shall be subject to any chattel mortgage, or a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier.

The Contractor warrants that, upon demand by County at any time after a progress payment has been made therefore, the Contractor will deliver to the County clear title to any materials, supplies, and/or equipment for which such progress payment was made, but which has not as yet been incorporated into the Work, such title to be free from any claims, liens, or changes, save only the Contractor's claim for the 10% withhold attributable to such materials, supplies, or equipment.

The Contractor further warrants clear title to all material, supplies, and equipment installed or incorporated in the Work, and agrees upon completion of the Work to deliver the premises, together with all

improvements and appurtenances, constructed or placed thereon pursuant to the Agreement for Construction, to the County, free from any claims, liens, or charges.

The Contractor agrees that neither he nor any person, firm or corporation furnishings any materials or labor for any Work pursuant to the Agreement for construction shall have any right to a lien upon the premises or any improvement or appurtenances thereon; provided, however, that nothing contained in this section shall defeat or impair the rights of persons furnishing materials or labor under the Payment Bond posted by the Contractor, nor any rights covered under any law permitting such persons to look to funds due to the Contractor but withheld by the County.

This section shall not disallow the Contractor's installing any devices or equipment of utility companies or of governmental agencies, the title to which is commonly retained by the utility company or the agency.

Section 6.09. PATENTS AND ROYALTIES.

All fees, claims, or royalties for any patented or copyrighted invention, article, arrangement, or plan that may be used upon or in any manner connected with the doing of the Work or any part thereof shall be included in the price bid for doing the Work. The Contractor and his sureties shall protect and hold harmless the County and all of its officer, agents, and employees against any and all demands made for such fees or claims and against any and all suits, demands, claims, or causes of action brought or made by the holder of any invention, patent, copyright or trademark, or arising from any alleged infringement of any invention, patent, copyright, or trademark.

Before final payment, the Contractor shall furnish acceptable proof to the Contract Administrator of proper release from all such fees or claims.

Section 6.10. PAYMENT OF FEDERAL OR STATE TAXES.

Any Federal, State, or local tax, specifically including sales and use taxes, payable on materials incorporated in the Work shall be included in the Contract price and paid by the Contractor.

The County will furnish the contractor with a certificate, on forms provided by the Contractor, to the effect that such materials are for the exclusive use of the County.

Section 6.11. PRODUCT CERTIFICATION.

Where required by the Technical Specifications, the Contractor shall submit proper product Certifications, which demonstrate the product's conformity to the Technical Specifications. Article 5 shall apply thereto.

ARTICLE 7.

PRODUCT OPTIONS AND SUBSTITUTIONS.

Section 7.01. APPLICABILITY OF ARTICLE.

This Article authorizes the Contractor to request substitutions of equal materials pursuant to Public Contracts Code Section 3400. Applications for such Substitutions shall be considered by the County only if the contractor's submittal is received within the time and includes all information specified herein and in the Contract Documents.

The Contractor is responsible to file all such requests on behalf of all subcontractors and product supplies; the County shall consider no request filed by a subcontractor or product supplies.

Only one request for Substitution shall be considered for each product specified. If the Contractor's request for Substitution is denied, the Contractor shall provide the specified first preference product.

Section 7.02. EFFECT OF BRAND NAME MATERIALS SPECIFICATION.

Unless otherwise expressly specified, whenever in the Contract Documents any materials, products, processes or articles are indicated or specified by the name brands of the manufacturers or products, or by patent or proprietary names, such Specifications shall be deemed to be followed by the words, "or equal", unless the specification expressly states that there is no known equal, or that the particular product specified is a unique or novel product application required to be used in the public interest. When materials are specified by reference to brand names, such specification is intended to incorporate all specifications of the listed brand as the measure of the type, quality and utility of the material so specified, and is not intended to limit the bidding, directly or indirectly, to any one specific concern.

Section 7.03. NECESSITY FOR SUBSTITUTION REQUESTS.

If materials are specified only by reference to standards, with no brand or proprietary trade name listed, any product meeting the specified standards may be provided, and no request for Substitution is required. No product not meeting the specified standards shall be provided unless a change order is approved so authorizing.

If materials are specified by listing more than one manufacturer or product, and the specification does not list one as the first preference manufacturer or product and the others as optional, any manufacturer or product listed may be provided, and no request for Substitution is required. If material is proposed other than the listed manufacturers or products, a Substitution shall be proposed by the Contractor pursuant to this Article.

Section 7.04. TIME FOR REQUESTING SUBSTITUTIONS.

All requests for Substitutions shall be submitted to the Contract Administrator no later than thirty-five (35) calendar days from the date of the Award of Contract. Thereafter, this Article shall be of no further effect, and the Contractor shall provide only the material specified.

Any further requests to provide materials other than those specified shall be treated as Change Orders, subject to Article 16. The County reserves the right to refuse to accept applications for such Change Orders and has no obligation to review such applications. Such applications shall not be accepted for review unless the Contract Administrator has previously determined that it is in the County's best interest to do so.

Section 7.05. APPLICATION FOR SUBSTITUTIONS; CONTENTS.

Applications for Substitutions shall be accepted for review only if the application is timely filed, and includes the following information:

A. All Technical Specification Section Number(s) where the material is specified;

B. If the material is proposed as an "or equal" Substitution, submittals to demonstrate that the material in fact is equal in all respects to that specified or, if applicable, to the first preference specified, including detailed drawings, construction specifications, performance specifications and warranty information for the material proposed for Substitution.

C. Complete Working Drawings and specifications demonstrating how the Substitution is to be incorporated into the Work so that the system of which the substituted material is a component will be a coordinated system fully compatible with all related systems, in conformity with the intent of the Contract Drawings.

D. Complete identification of all changes in related Work necessary to accommodate the Substitution, including but not limited to structural, mechanical and electrical changes.

E. Cost information necessary to evaluate the net difference in cost of the specified material against that proposed for Substitution, including the supplies' cost quotations and the Contractor's labor estimates.

F. Contractor's written assurance that the material is in fact equal in all respects to the material specified, or if applicable, the first preference specified; and that if the Substitution is accepted, the Contractor will bear all costs of incorporating the substituted material into the Work to provide a complete system which conforms to the design intent; and that no Contract Price or Time increase will be sought by Contractor on account thereof.

Failure by the Contractor to identify all deviations from the Contract Documents in his request for Substitution shall render any County action taken thereon null and void. Contractor shall bear all costs resulting from any error in the request for Substitution.

Section 7.06. ACTION ON REQUEST.

Within twenty-one (21) days of receipt of complete submittals requesting a Substitution, with all supporting data necessary to evaluate the request, the Contract Administrator shall evaluate and act on the request. The decision of the Contract Administrator shall be final. No Contract Time Extensions shall be allowed on account of an incomplete request for Substitution or the timely decision on such request.

The Contract Administrator shall authorize a Substitution only if he finds that the material requested is equal in all respects to that specified and is consistent with the design intent of the Contract Drawings.

The Contractor shall bear the burden of proving to the County's satisfaction that the material proposed in the substitution request is of equal quality and performance to the originally specified material in all respects and is compatible with the design intent.

The Contract Administrator's evaluation shall consider, but is not limited to, the following factors:

A. All product data for the originally specified material as against that for the requested Substitution;

B. The compatibility of the substitution with the remaining components of the system(s) of which it is a part.

C. The conformity of the Substitution with the design intent.

D. The length and terms of the warranties for the material proposed in the Substitution.

E. The net cost advantage to the County for granting the Substitution request.

Section 7.07. SAMPLES AND TESTING OF PROPOSED SUBSTITUTIONS.

If the Contract Administrator determines that samples and/or testing are required to decide a request for a Substitution, he shall so advise the Contractor, and specify the materials or work to be sampled and/or tested. The Contractor shall at no cost to the County, provide such samples and testing as required to evaluate the requested Substitution. The results of the testing shall be evaluated by the Contract Administrator before action on the Substitution request. The time during which the sampling and testing is being conducted shall not be included within the time specified in Section 7.06.

Section 7.08. DESIGN COSTS FOR SUBSTITUTION.

If a Substitution is accepted, Contractor shall bear all costs associated therewith, including the cost of architect's and/or engineer's services required to adapt the substitution to the design to the complete satisfaction of the County, and all costs of mechanical, electrical, structural or other changes needed to adapt the Substitution to the Work. Contractor shall also bear all cost increases to the County for construction management services being provided to the County by independent contractors, resulting from the substitution.

Section 7.09. EFFECT OF ACCEPTANCE.

If a Substitution is accepted, the Contractor shall be solely and directly responsible for setting accepted substituted materials and/or equipment and systems into the available space, and for the proper operation of the substituted equipment with all other equipment with which it may be associated, all in a manner acceptable to the County and which conforms to the design intent.

No time extension shall be granted on account of a Substitution. The Contract Price shall be adjusted by the price difference between the accepted Substitution and the originally specified (first preference) material. Neither acceptance nor rejection of a Substitution request shall relieve the Contractor of any obligation to perform the Agreement for Construction according to its terms, other than as expressly modified by the accepted Substitution.

ARTICLE 8.

SAMPLES, TESTS AND TESTING LABORATORIES.

Section 8.01. CONTRACT COMPLIANCE TESTING; SAMPLES.

Materials and/or work that require sampling and/or testing to determine compliance with the Contract Documents are specified in the Technical Specifications. The Contractor shall bear the full cost of providing samples when required to perform the specified tests, and shall take, store and provide such samples in the manner specified in the Technical Specifications, including Division 1.

All such samples shall be selected by the Contract Administrator or the Testing Laboratory employed by the County.

Section 8.02. DELIVERY OF SAMPLES.

The Contractor shall, at his sole cost and expense, furnish, package, mark, and store all samples to be tested. Chain-of custody and sample security precautions shall be utilized, as specified or as instructed by the Contract Administrator.

Collection, preparation, curing and delivery of all samples shall be made in ample time to allow the test to be made without delaying construction. No extra time will be allowed for the completion of the Work by reason of delay in testing.

Section 8.03. TESTING LABORATORY; COSTS.

The County shall employ and pay for the services of one or more independent testing laboratory(ies) ("Test Laboratory") to perform all required contract compliance testing expressly specified in the Technical Specifications as being provided by the County.

The County reserves the right to utilize the Yolo County Public Works concrete testing laboratory for any and/or all specified concrete or paving tests.

All testing not specified as being provided by the County shall be provided by the Contractor, using testing agencies with the specified qualifications.

The County reserves the right to require the Contractor to provide samples and to perform tests in addition to those samples and/or tests specified in the Technical Specifications. In the event the County orders such additional samples and/or tests, the County shall be obligated to pay therefore only if the sample and/or test is acceptable. If the sample and/or test does not comply with the Contract Documents, the County shall deduct the cost of the extra testing, and any subsequent re-testing, from the next progress payment.

If the Contractor determines that testing in addition to that specified is necessary and/or convenient, the Contractor shall employ a separate testing laboratory. The results of such tests shall not be binding on the County.

Section 8.04. RE-TESTING.

If as a result of any test, whether originally specified or not, any material or work is found to be unacceptable, it shall be rejected, and the original test and all further sampling and testing required by the

County shall be at Contractor's expense. Re-testing shall not be charged against the specified contingency or testing allowances, if any.

Section 8.05. ACCESS TO SITE; COOPERATION.

The Contractor shall allow free access at all times to the representatives of the County's testing laboratory or consultant to the Work, or to any off-site area where Work is being performed and shall point out the sources from which samples are taken.

The Contractor shall cooperate with the testing laboratory to facilitate execution of its services and shall provide quantities of samples as specified.

Section 8.06. DAMAGE DUE TO TESTING.

Contractor shall, at his sole cost and expense, repair all damage resulting from testing or retesting specified in the Contract Documents. The County shall issue a Contract Price adjustment for repair of damage due to sampling or testing in addition to that specified in the Contract Documents, if and only if the additional testing shows full compliance with the Contract Documents; otherwise, the Contractor shall be obligated to repair such damage.

Section 8.07. RESULTS OF SAMPLING/TESTING.

No materials or work of which samples and/or tests are required shall be used or covered until the Contract Administrator approves such samples and/or tests. If the Contractor installs, uses or covers any such material, article or work prior to testing and approval, such shall be at Contractor's sole risk and expense, and he shall bear all costs of uncovering, repair and replacement thereof.

Upon testing of any sample of material or work, no additional sample shall be considered.

Section 8.08. EFFECT OF SAMPLING AND TESTING.

The County assumes no obligation, and the Contractor shall be relieved of no obligation undertaken pursuant to the Agreement for Construction, by virtue of sampling and testing specified in this Article. The responsibility for incorporating satisfactory materials and workmanship, which meet the Contract Documents, into the Work rest entirely with the Contractor, notwithstanding any prior samples or tests.

The Contractor is not relieved of this obligation by virtue of the results of any test or the failure of the testing laboratory or consultant accurately to ascertain or report test results.

Section 8.09. CODE COMPLIANCE TESTING; COSTS.

The Contractor shall bear all costs for all sampling and/or testing required by all agencies of jurisdiction regarding compliance of the Work with the Codes those agencies enforce. Examples include but are not limited to Building, Fire, Health, Air Pollution, and CALOSHA Code and regulation and compliance testing.

The Contractor shall arrange for and conduct all such testing in conformity with applicable codes and regulations and shall schedule the testing so as not to delay the Work.

ARTICLE 9.

REJECTION AND REPLACEMENT OF WORK AND MATERIALS.

Section 9.01. REJECTION OF MATERIALS AND WORKMANSHIP.

The County shall reject materials that are determined by the Contract Administrator to be defective or fail to comply fully with the Contract Documents, and workmanship that is not first-class, competent and workmanlike in all respects. Rejected workmanship shall be corrected satisfactorily and rejected materials shall be removed from the premise and replaced, all without cost to the County.

Section 9.02. REMOVAL OF REJECTED MATERIALS.

The Contractor promptly shall remove from the Site all materials that have been rejected.

Upon request by the Contract Administrator, the Contractor shall submit a statement of the source for rejected materials. The County reserves the right to notify such source that the specified materials have not been and will not be incorporated into the Work, and no claim or stop notice therefore will be recognized. The Contractor shall fully indemnify the County for any claims, costs, or demands made by any supplier regarding such materials. The County reserves the right to satisfy any such supplier's claims by issuing a warrant jointly payable to the Contractor and the supplier, the amount of which shall be deducted from the next progress payment due to the Contractor.

Section 9.03. FAILURE TO REMOVE REJECTED MATERIALS.

If the Contractor does not remove rejected materials within a reasonable time, fixed by the written notice from the Contract Administrator, the County may remove such materials and may store or return the materials to the supplier, all at the expense of the Contractor. Contractor shall also bear the cost of replacement of any work damaged due to the removal of materials pursuant to this Section.

Any materials removed and stored pursuant to this section shall remain the property and the responsibility of the Contractor, and it is the Contractor's obligation to dispose of such materials. Such materials shall not again be brought upon the Site or any County-approved storage facility.

Section 9.04. FAILURE TO CORRECT REJECTED WORK; WITHHOLD AND DEDUCTION.

If the Contractor fails to correct rejected workmanship and/or materials, the County may withhold the cost to correct the rejected work, and the value of the rejected materials, from the Progress Payments due the Contractor.

If the work is not corrected prior to recordation of a Notice of Cessation or Notice of Completion, the County shall process a Contract Price Change Order to decrease the Contractor's final payment by an amount equal to the cost to cure the defect, measured by the cost the County would incur to purchase and install the specified material, and/or to correct the faulty workmanship, to bring the Work into full compliance with the Contract Documents.

Section 9.05. RESERVATION OF RIGHTS.

The County's authority to reject work under this Article is in addition to all other County rights under the Agreement for Construction. Neither the County's action or inaction under this Article shall relieve the Contractor from any obligation under this Agreement, nor constitute a waiver by the County of any other right under the Agreement for Construction.

ARTICLE 10.

SUPERVISION AND LABOR.

Section 10.01. SKILLED LABOR.

All labor shall be especially skilled for the kind of Work required, shall be conducted under the direction of a competent foreman, and workmanship shall be of the highest quality and finish, competent and workmanlike in all aspects.

All workers shall meet the skill and experience requirements specified in the applicable sections of the Technical Specifications.

Section 10.02. NO TENANCY.

All workers, contractors, or Contractor's representatives are admitted to the Site only for the proper execution of the Work and have no tenancy.

Section 10.03. DISMISSAL OF UNSATISFACTORY EMPLOYEES.

All employees engaged in the Work will be considered employees of the Contractor.

The Contractor shall discharge, or cause a subcontractor to discharge, any incompetent employee, any employee not skilled for the type of work required, or any employee who violated the standard set forth in Section 10.06 habitually or flagrantly.

Section 10.04. PERSONAL ATTENTION AND SUPERINTENDENCE; CONTRACTOR'S AGENT.

The Contractor shall supervise the Work to the end that it shall be faithfully prosecuted.

The Contractor at all times keep a Project Superintendent, fully empowered to act as agent for the Contractor, on the Site or available by telephone and within a reasonable distance. Contractor shall advise the County in writing of its agent, and of any limitations on the agent's authority to act on behalf of the Contractor. Regardless of such limitations, the Contractor shall be responsible for the faithful observation of all instructions delivered to it or its Project Superintendent, and representations on behalf of the Contractor by the Superintendent shall be binding on the Contractor.

Section 10.05. AUTHORIZED COUNTY VISITORS TO THE SITE.

The Contract Administrator shall specify those individuals who are entitled to access to the Site.

If the Contractor has complaints regarding the presence or conduct of any authorized individual on the Site, the Contractor shall report such complaint to the Contract Administrator, and shall conform to the instructions of the Contract Administrator regarding the complaint.

After consultation with the Contract Administrator, the Contractor may enforce reasonable regulations to secure the safety of authorized visitors. Such regulations may include the requirements to check in at a designated location and wear "hard hats" in specified areas.

Section 10.06. RELATIONSHIPS OF EMPLOYEES AND COUNTY EMPLOYEES AND THE PUBLIC.

It is the policy of the County of Yolo and the law of this State that all County employees be free from sexual, racial, or other harassment at their workplace; it is the policy of the County that all members of the public likewise be free there from.

It is Contractor's responsibility to supervise all workers on this Project to the end that their conduct does not result in a violation of this policy.

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ARTICLE 11.

SUBCONTRACTORS; LISTING AND BID; SUBSTITUTION.

Section 11.01. SUBCONTRACTORS; CONTRACTOR'S SUPERVISION.

Nothing contained in the Agreement for Construction shall create any contractual relationship between any subcontractor and the County of Yolo. The County's only contract is with the Contractor.

The Contractor shall be as fully responsible to the County for the performance and/or omissions of all first-tier and lower-tier subcontractors and their employees and agents as it is for its own performance and omissions.

It is the Contractor's responsibility, not the County's, to resolve disputes between subcontractors and/or between the Contractor and subcontractors. The Contractor shall not simply refer issues raised by subcontractors to the Contract Administrator. Prior to referring any controversy, issue, or request made by any subcontractor to the County, the Contractor shall exert his good faith best efforts to resolve the issue. Upon referring any such request, the Contractor shall accompany it with a submittal specifying efforts taken by the Contractor to resolve the issue. Should the Contract Administrator determine that the Contractor has not satisfied his obligation pursuant to this section, the Contract Administrator may reject the Contractor's submittal. The Contractor shall not be entitled to either a Contract Price or a Contract Time Change Order as a result of such rejected submittal.

It is also the Contractor's responsibility to supervise all subcontractors' compliance with all safety, wage and hours, equal employment opportunity and related regulations, including reporting requirements.

The County shall not entertain any request for, nor engage in, arbitration or dispute resolution between subcontractors, subcontractors and the Contractor, nor any agency with Code compliance, safety, wage and hours, and/or equal employment opportunity jurisdiction. However, in the event of such dispute, the Contract Administrator may request the Contractor to provide a complete written explanation of all facts underlying the dispute and may attend or call any meetings between the disputing parties. The Contractor shall provide such information to the Contract Administrator upon his request.

The County shall not be liable to the Contractor for any claims by subcontractors, suppliers, laborers, workers, or any other person, including claims that are settled by and assigned to the Contractor. The Contractor shall indemnify, defend and hold harmless the County, its officers, agents and employees from and against any and all such claims.

Section 11.02. DISPUTES BETWEEN SUBCONTRACTORS AND/OR CONTRACTOR.

If, through acts of neglect on the part of the Contractor, including failure to supervise and control his subcontractors, any other contractor, subcontractor, or workman shall suffer loss or damage on the Work, Contractor agrees to settle with such other contractor, subcontractor, or workman by agreement or arbitration, if such other contractor, subcontractor, or workman shall assert any claim against the County of Yolo or any of its officers, agents, or employees, on account of any damage alleged to have been so sustained.

In the event of the receipt of any such claim, the County shall notify the Contractor, who shall defend, indemnify, and save harmless the County and all of its officers, agents, and employees against any such claim, pursuant to Section 2.05 hereof.

Section 11.03. LISTING OF SUBCONTRACTORS.

Contractor shall comply with the requirements in the Instructions to Bidders regarding the listing of subcontractors and shall comply with the requirements of the Subletting and Subcontracting Fair Practices Act, Public Contracts Code Sections 4100 and following, forbidding bid shopping and bid peddling and requiring accurate listing of all subcontractors.

Should the Contractor violate any provision of that Chapter, such violation shall be deemed a breach of the Agreement for Construction, and the County shall have all remedies provided by California law including, but not limited to, those provided in Public Contracts Code Section 4110, allowing termination of the Contract or a penalty assessment of 10% of the subcontract.

Section 11.04. TERMINATION OF UNSATISFACTORY SUBCONTRACTORS.

When any portion of the Work that has been subcontracted by the Contractor is not being prosecuted in a satisfactory manner, the Contractor shall terminate the subcontract for such work.

Any such subcontractor who is discharged shall not again be employed on the Project.

Any termination of a subcontractor pursuant to this section shall be in strict conformity with the Subletting and Subcontracting Fair Practices Act, Public Contracts Code Sections 4100 and following.

Section 11.05. SUBCONTRACTORS' INSURANCE.

All subcontractors shall procure and maintain the insurance required by Article 2 hereof. Contractor shall supervise subcontractors to enforce this requirement and shall allow no subcontractor to evade this requirement.

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ARTICLE 12.

STATE REQUIREMENTS REGARDING WAGES, HOURS, AND EQUAL OPPORTUNITY.

Section 12.01. PREVAILING WAGE RATE NOTICE

As provided under Labor Code Sections 1726-1861, the Director of the Department of Industrial Relations (DIR) of the State of California has determined the prevailing rate of wages in the locality in which the Work on the project is to be performed for each craft, classification, or type of Worker needed to execute this Contract. The prevailing rates so determined are on file with the COUNTY, and they are available for public inspection. They may also be obtained on the internet at http://www.dir.ca.gov/DIR/S&R/statistics_research.html. Those prevailing wage rates hereby are incorporated in this agreement and made a part hereof.

The CONTRACTOR shall obtain and post copies of these prevailing wage rates in a prominent place at the job site, in accordance with the regulations of the Department of Industrial Relations.

If the Project is subject to the requirements of Title 8 of the California Code of Regulations, Section 16461, the CONTRACTOR shall post on the jobsite a Notice containing the following language:

DIR will no longer charge awarding bodies for prevailing wage compliance monitoring and enforcement by the CMU.

SB 854 (2014) established a public Works CONTRACTOR registration program to replace prior Compliance Monitoring Unit (CMU) and Labor Compliance Program (LCP) requirements for bond-funded and other specified public Works projects.

- Pursuant to Labor Code section 1725.5 and 1771.3, contractors and subcontractors who intend to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No proposal will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. CONTRACTOR and its subcontractors, of any tier, shall maintain active registration with the Department of Industrial Relations for the duration of the project. Information is available at: http://www.dir.ca.gov/Public-Works/PublicWorks.html. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. In bidding on this Project, it shall be CONTRACTOR's sole responsibility to evaluate and comply with all labor compliance requirements and applicable laws in performing the Agreement for Construction.

Section 12.02. PAYMENT OF PREVAILING WAGE RATES.

Pursuant to Labor Code Section 1772, Workers employed by contractors or subcontractors in the execution of any contract for public Work are deemed to be employed upon public Work as defined in Labor Code Sections 1720-1725. Therefore, the CONTRACTOR shall pay, and shall cause all subcontractors, whether under contract with the CONTRACTOR or under contract with any subcontractor, to pay not less than the specified prevailing wage rates to all Workers employed in the execution of this Contract.

In accordance with Labor Code Section 1775, the CONTRACTOR shall monitor the payment of the specified general prevailing rate of per diem wages by subcontractors to employees by periodic review of the certified payrolls of the Subcontractors.

Section 12.03. WAGE RATES FOR CRAFTS NOT LISTED.

The responsibility to check prevailing wage rates is the CONTRACTOR's. Pursuant to Labor Code Section 1773, the CONTRACTOR may file with the Director of DIR or the Chief of the Division of Labor Standards Enforcement ("DLSE") a petition to review a determination of any rate or rates made by the Director of DIR. The CONTRACTOR may also petition the Director of DIR to make a determination for a particular craft, classification or type of Work not covered by a general determination. Pending the review or

determination, the wages may be assumed to be those in the applicable collective bargaining agreement, but no adjustment in the bid or Contract Price shall be made if such assumption is incorrect.

Section 12.04 RECORDS OF HOURS WORKED AND WAGES

The CONTRACTOR shall keep, and shall cause all subcontractors on the Project to keep, certified payroll records of the hours and wages of all employees employed on the Project, and those records shall be open at all times for inspection by the COUNTY and/or the Division of Labor Statistics and Enforcement, in accordance with Sections 1776 and 1812 of the Labor Code. The certified payroll records shall contain at least the following information: the name, address, social security number, Work classification, dates of payroll period, straight time, and overtime hours Worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, Worker, or other employee employed by the CONTRACTOR and/or each Subcontractor in connection with the Work.

In the event that the CONTRACTOR and/or any subcontractor fails to submit certified payroll records to the COUNTY within ten (10) calendar days of a request from the COUNTY for the records, the CONTRACTOR and/or the Subcontractor shall, as a penalty, forfeit one hundred dollars ($100) per calendar day, per Worker, until strict compliance is effectuated. These penalties shall be withheld from progress payments then due and/or to become due. The CONTRACTOR is not subject to this penalty assessment due to the failure of a Subcontractor to comply with these requirements if the CONTRACTOR can demonstrate that it has fully complied with the provisions of Labor Code Section 1776.

The CONTRACTOR shall not carry on its payrolls any person not actually employed by the CONTRACTOR, nor shall it carry on its payroll's employees of any Subcontractor. The CONTRACTOR shall show on its payrolls all persons actually employed by the CONTRACTOR on the Project, in any capacity. The CONTRACTOR shall cause all subcontractors on the Project, whether under contract with the CONTRACTOR or under contract with any subcontractor, to comply with this Section.

In accordance with Government Code Section 8546.7, or any amendments thereto, all books, records, and files of the CONTRACTOR, or any subcontractor connected with the performance of this Contract, shall be subject to examination and audit by the Auditor General for a period of three (3) years after final payment. CONTRACTOR shall preserve and cause all Subcontractors to preserve such books, records and files for the audit period.

Section 12.05. ADDITIONAL REQUIREMENTS FOR LABOR COMPLIANCE

In accordance with Section 16463 of Title 8 of the California Code of Regulations ("8 CCR Section 16463"), the COUNTY may, on its own or if required by the Labor Commissioner, withhold funds due to the CONTRACTOR when payroll records are delinquent or inadequate. The amount withheld shall be those payments due or estimated to be due to the CONTRACTOR or subcontractor whose payroll records are delinquent or inadequate, plus any additional amount that the Labor Commissioner has reasonable cause to believe may be needed to cover a back wage and penalty assessment against the CONTRACTOR or subcontractor whose payroll records are delinquent or inadequate. The CONTRACTOR shall cease all payments to a Subcontractor whose payroll records are delinquent or inadequate until the Labor Commissioner provides notice that the Subcontractor has cured the delinquency or deficiency. When payments are withheld under 8 CCR Section 16463, the Labor Commissioner will provide the CONTRACTOR and Subcontractor, if applicable, with immediate written notice that includes all of the following: (1) a statement that payments are being withheld due to delinquent or inadequate payroll records, and that identifies what records are missing or states why records that have been submitted are deemed inadequate; (2) specifies what amounts the CONTRACTOR has been directed to withhold; and (3) informs the CONTRACTOR or subcontractor of the right to request an expedited hearing to review the withholding of payments under Labor Code Section 1742, limited to the issue of whether the records are delinquent or inadequate or the Labor Commissioner has exceeded his or her authority under 8 CCR Section 16463. The withholdings under 8 CCR Section 16463 do not preclude assessment of penalties under Labor Code Section 1776(g) for failure to timely comply with a written request for certified payroll records, as set forth below.

Section 12.06 UNDERPAYMENT OF WAGES

The CONTRACTOR agrees that in the event of underpayment of wages to any employee on the Project, whether by the CONTRACTOR or any subcontractor on the Project, the COUNTY may retain from payments due to the CONTRACTOR, an amount sufficient to pay such Worker the difference between the wages required to be paid by the DIR, and the wages actually paid such Worker for the total number of hours Worked, plus any penalties and forfeitures. The COUNTY may disburse such retention to such employees.

Section 12.07. APPRENTICES.

Attention is directed to the provisions of Sections 1777.5, 1777.6 and 1777.7 of the Labor Code concerning the employment of apprentices by the CONTRACTOR or any subcontractor.

The CONTRACTOR and all subcontractors on the Project shall comply with the requirements of Sections 1777.5 and Section 1777.6 of the Labor Code in the employment of apprentices. Violation of these requirements shall subject the CONTRACTOR and/or subcontractor to the penalties set forth in Section 1777.7 of the Labor Code and/or otherwise provided by law or Contract.

Information relative to apprentice standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, ex-officio the Administrator of Apprenticeship, San Francisco, California, from the Division of Apprenticeship Standards or its branch offices, and/or on the DLSR website at www.dir.ca.gov/DLSR/PWD. Apprentices employed on the Project must at all times Work with or be under the direct supervision of a journeyman or journeymen.

Section 12.08 PENALTIES

In accordance with Articles 2 and 3, Chapter 1, Part 7, Division 2 of the Labor Code, particularly Sections 1775, 1776, 1777.7 and 1813, the CONTRACTOR shall forfeit to COUNTY as a penalty the sum specified below, over and above any retention or withholds otherwise authorized by the agreement, as follows:

A. Up to two hundred dollars ($200) for each calendar day, or portion thereof, for each Worker paid less than the applicable prevailing wages for any Work done by him/her under this Contract or under any subcontract on the Project, with the amount to be determined by the Labor Commissioner in accordance with the considerations set forth in Labor Code section 1775. If a Worker employed by a Subcontractor on the Project is paid less than the prevailing wages by the Subcontractor, the CONTRACTOR is not subject to this penalty assessment if the CONTRACTOR can demonstrate that it did not have knowledge of that failure of the Subcontractor to pay the prevailing wages and that it strictly complied with the requirements of Labor Code Section 1775(b).

B. Twenty-five dollars ($25) for each Worker employed in the execution of this agreement by the CONTRACTOR or by any Subcontractor on the Project for each calendar day during which such Worker is required or permitted to Work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of the provisions of Article 3.

C. Failure to provide certified payroll records to the COUNTY or, if applicable, to the CMU, within ten (10) calendar days of a request, shall, in addition to resulting in a withholding of payments due or estimated to be due, result in a penalty in the amount of one hundred dollars ($100) for each calendar day, or portion thereof, for each Worker until strict compliance is effectuated. The CONTRACTOR is not subject to this penalty assessment due to the failure of a Subcontractor to comply with these requirements if the CONTRACTOR can demonstrate that it has fully complied with the provisions of Labor Code Section 1776.

D. Knowing violation of Labor Code Section 1777.5 shall yield a penalty in an amount not exceeding one hundred dollars ($100) for each full calendar day of non-compliance. A CONTRACTOR or Subcontractor who knowingly commits a second or subsequent violation of Section 1777.5 within a

three-year period, where noncompliance results in apprenticeship training not being provided as required, shall forfeit as a civil penalty the sum of no more than three hundred dollars ($300) for each full calendar day of noncompliance.

Section 12.09. HOURS OF WORK AND APPROVAL OF SCHEDULES

Eight (8) hours of labor constitutes a legal day's Work, and forty (40) hours constitutes a legal Work week. No Worker employed at any time by the CONTRACTOR, or by any subcontractor upon the Project, shall be required or permitted to Work more than eight (8) hours in any one calendar day or forty (40) hours in any one week, except as provided in Labor Code Sections 1810 through 1815.

Overtime shall be paid at the rate of not less than one and one-half (1-1/2) times the basic rate of pay, or at such other rate as stated on the applicable Determination issued by the DIR, or as may be required by applicable statutes or collective bargaining agreements.

The COUNTY reserves the right to approve or disapprove the days scheduled for Work, and the hours during which Work is in progress.

Section 12.10. COMPLIANCE WITH THE STATE ANTI-DISCRIMINATION LAWS

The CONTRACTOR shall comply with Section 1735 of the Labor Code, which provides as follows:

> "A contractor shall not discriminate in the employment of persons upon public works on any basis listed in subdivision (a) of Section 12940 of the Government Code, as those bases are defined in Sections 12926 and 12926.1 of the Government Code, except as otherwise provided in Section 12940 of the Government Code. Every contractor for public Works who violates this section is subject to all the penalties imposed for a violation of this chapter."

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ARTICLE 13.

FEDERAL REQUIREMENTS REGARDING WAGES, HOURS, AND EQUAL OPPORTUNITY

SEE SUPPLEMENTARY CONDITIONS

ARTICLE 14.

ON-SITE SECURITY; RISK OF LOSS; SITE SAFETY.

Section 14.01. PROJECT SITE.

The Contractor shall confine his equipment, materials, and construction apparatus to the site limits designated in the Contract Documents and/or directed by the Contract Administrator.

The Site and equipment storage areas shall be kept in a neat and safe condition, conforming to all requirements of the Contract Documents and applicable Codes regarding the storage of materials, including flammable materials.

Section 14.02. SECURITY OF THE SITE.

The Contractor shall take such steps as are necessary to secure the Site at all times, including times workmen are not present. The Contractor shall maintain adequate security and protection of all structures, facilities, equipment, tools, materials, and any other property on or adjacent to the Site, against damage, vandalism, loss of fire, or theft.

The Contractor's attention is directed to the Technical Specifications and/or Supplementary Condition for specified fencing, screening, gate and lighting requirements, if any.

The Contractor may, at its option and expense, provide night watchmen for the Site. The facilities for such watchmen shall be subject to approval by all agencies with jurisdiction.

At the Contract Administrator's request, the Contractor shall meet with representatives of the police and fire agencies with jurisdiction and shall comply with the Contract Administrator's request on behalf of such departments regarding security of the Site.

Section 14.03. RISK OF LOSS.

The Contractor assumes full responsibility for site security and full liability for the risk of loss from any cause of materials stored, work performed and existing improvements on the site, and agrees to repair and replace, at no cost to the County, at the time they are needed for incorporation in the Work, any materials or work that may have become lost, damaged, destroyed, stolen, vandalized, or have otherwise been rendered unsuitable for use from any cause. Contractor shall repair or replace any such damage and remove any damaged or defaced materials and/or equipment from the Project Site, at no cost to the County, and Article 9 hereof shall apply to such material or equipment.

Section 14.04. PROTECTION OF WORKMEN AND VISITORS TO THE SITE.

Contractor shall take all necessary precautions for the safety of all employees and visitors to the Site and shall comply with all applicable provisions of the Federal, State and local safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the Site.

Contractor shall erect and properly maintain at all times, as required by the condition and progress of the Work, all necessary safeguards for the protection of workmen, visitors to the Site, and the public, and shall post danger signs warning against construction hazards as needed.

The responsibility for maintaining a safe site shall be the Contractor's and the County undertakes no obligation to suspend the Work or notify the Contractor of any hazardous condition or noncompliance with safety laws.

Contractor shall designate a responsible member of his organization on the Work, whose duty shall be the prevention of accidents. The name and position of persons so designated shall be reported to the

Contract Administrator by the Contractor; absent designation of some other individual by the Contractor, the Contractor's Project superintendent shall be responsible for the Contractor's safety program.

Contractor shall immediately replace or repair any unsafe, dangerous, or hazardous condition that may exist.

Section 14.05. EXCAVATION AND TRENCHING; SAFETY.

The Contractor shall comply with of all provisions of law regarding safety requirements for trenches or excavations.

A. Public Contract Code '7104 provides:

(a) That the contractor shall promptly, and before the following conditions are disturbed, notify the public entity, in writing, of any: (1) Material that the contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law; (2) Subsurface or latent physical conditions at the site differing from those indicated; (3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

(b) That the public entity shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the contractor's cost of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in the contract.

(c) That, in the event that a dispute arises between the public entity and the contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the contractor's cost of, or time required for, performance of any part of the work, the contractor shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract.

B. Labor Code Section 6705 provides that in advance of any excavation of any trench or trenches or other excavation five (5) feet or more in depth, the Contractor shall submit a detailed plan to the Contract Administrator for information only showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from California State Shoring System standards, the plan shall be prepared by a registered civil or structural engineer.

C. Nothing in the Contract Documents shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders of the State of California.

Nothing in this Section shall be construed to impose liability on the County of Yolo or any of its officers, agents, or employees, or to relieve the Contractor of its obligations to provide a safe site.

Section 14.06. CAL OSHA.

The contractor shall comply with all requirements of the California Occupational Safety and Health Administration or its successor, and the Federal equivalent, and shall provide a safe work environment for all workers employed on the Work, as required by such agencies. The Contractor shall supervise performance of the Work with all occupational health & safety requirements applicable to the type of work being done, and the materials and equipment being utilized. (See also Section 20.05).

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ARTICLE 15.

OFF-SITE SAFETY AND PROTECTION OF ADJACENT PROPERTY; INDEMNITY.

Section 15.01. PROTECTION OF ADJACENT PROPERTY DURING EXCAVATION OR OTHER OPERATIONS; NOTICES.

In addition to any requirements imposed by law, the Contractor shall shore up, brace, underpin, and protect as may be necessary all foundations and other parts of all existing structures on the Site or adjacent to the site which are in any way affected by the excavations or other operations connected with performance of the Work.

Not less than five (5) days prior to commencing any work which may detrimentally affect adjoining or adjacent land or buildings thereon, the contractor shall send the owner and occupants thereof a notice, which specifies the type of Work to be done, the schedule of the Work, the effects expected from the Work, and the protective measures being taken by the Contractor. A copy of the notice shall be sent to the Contractor Administrator.

The basic standard to determine whether the Work may detrimentally effect adjoining properties shall be whether the work will create noise, dust, vibration, and/or settling on such properties. Examples include, but are not limited to, blasting, pile driving and excavations within 30 feet of any structure not owned by the County.

The Contractor shall, at the instruction of the Contract Administrator, meet with any recipient of such notice to explain and discuss the proposed Work. The Contractor shall make such modifications to the proposed working methods as are required to comply with all provisions of law, and shall exert its best efforts to address the concerns expressed by recipients of such notices.

Section 15.02. UNDERGROUND UTILITIES; "USA".

The Contractor is responsible to coordinate all excavation work with the owners of existing underground utilities, and to avoid unintentional disruptions in services by those utilities. Locations of existing utilities shown on the Contract Drawings are schematic only and shall not relieve the Contractor's duty to precisely locate and avoid them.

If the underground utility service is disrupted by the Work, the Contractor shall take emergency action appropriate to the situation and immediately notify the owner of the utility. Repair thereof shall be the Contractor's responsibility, at no cost to the County.

The Contractor is advised that the County participates in the Underground Service Alert-Northern California ("USA"), which may be contacted by telephone at (800) 227-2600. Except in an emergency, the Contractor shall contact the USA Notification center at least two working days prior to commencing an excavation in any area that contains subsurface installations.

Section 15.03. DAMAGE TO OR BLOCKING STREETS, STREET IMPROVEMENTS AND TRACKS.

The Contractor is responsible to avoid damage to existing streets, sidewalks, curbs, traffic signs and signals, streetlights, control boxes, meters, railroad tracks, crossing guards, and all other appurtenances thereto. The Contractor shall take necessary precautions to avoid damage to such property, and if damage occurs, shall take emergency action appropriate to the situation and immediately notify the owner of the damaged property. Repair thereof shall be the Contractor's responsibility, at no cost to the County.

Existing traffic signs, lights, traffic signals, railroad crossing warnings, control boxes, hydrants, meters and related safety items occurring within the street and/or sidewalk area shall be kept visible, free of obstructions and accessible at all times.

Should it be necessary to cover up, move, or alter such items, this shall be done only with permission of the authorities having jurisdiction of the items involved.

Should it be necessary to block a street or sidewalk, the Contractor shall first notify the police, fire, or public works agencies with Jurisdiction, and shall comply with their instructions, including scheduling limitations.

Section 15.04. FIRE PROTECTION.

The Contractor is responsible to protect all structures from fires and sparks originating in the work, and all laws and regulations regarding fire protection, and shall comply with all instructions of the fire department with jurisdiction.

The Contractor shall notify the Contract Administrator and the fire department prior to disconnection of either water or electrical service to the Site, and shall comply with the fire department's instructions regarding fire safety.

The Contractor shall provide fire extinguishers as necessary to protect the Site and adjacent structures at all times, in accordance with applicable Fire Codes, regulations and Fire Department instructions.

Section 15.05. DUST CONTROL.

The Contractor shall at all times control dust originating from the Site by sprinkling as needed. The Contractor shall not allow dust to be blown onto adjacent properties. In the event that complaints are received by the County regarding dust control, the Contractor shall increase sprinkling to control the dust.

Section 15.06. INDEMNITY FOR DAMAGE TO ADJACENT PROPERTY; REPAIRS.

A. **Indemnity**. Without limitation of its indemnity obligations set forth in Article 3 hereof, Contractor shall defend, indemnify, and save harmless the County from any claim, loss or damages on account of any harm to person or property alleged to have resulted from the Work, the performance of this Agreement or Contractor's acts or omissions in protecting the public from the effects of the Work including settlement and/or the loss of lateral subjacent support of adjoining property; damage to utilities' or governmental agencies' equipment or installations; injuries to persons using the public streets; and from all loss or expense and from all damages for which the County may be liable as a consequence of such injury or damage to person an/or adjoining or adjacent property and/or structures' or equipment or installations, including those owned by Yolo County.

B. **Repairs**. Any damage arising from or in consequence of the performance of the Agreement for Construction to tracks, pavement, curbs, sidewalks, walls, stairs, sewage and/or drainage structures, mains, pipes, valves, conduits, poles, wires, transformers, trees, shrubs, adjoining work, or to any other improvement or property above or below the surface of the ground, whether private or public, shall be repaired at once by Contractor without expense to the County, if the owner thereof consents.

Section 15.07. EMERGENCY SAFETY ACTIONS.

In an emergency affecting the safety of life or property, including adjoining property, the Contractor, without previous instructions or authorizations from the County, shall act at the Contractor's discretion and risk to prevent such threatened loss or injury, and shall bear all costs of such action. The Contractor immediately shall notify the Contract Administrator of such actions, and thereafter shall comply with any instructions issued by the Contractor Administrator.

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ARTICLE 16.

CONDUCT AND PROSECUTION OF THE WORK.

Section 16.01. BASIC STANDARD.

The Contractor is responsible for all aspects of the full, complete, satisfactory and faithful performance of the Work strictly as specified by the Contract Documents or any duly issued amendments thereto as well as all applicable laws and regulations.

Section 16.02. SURVEYS AND FIELD ENGINEERING.

Unless otherwise specified, the Contractor is responsible for all survey and field engineering work required for performing the Work. All such survey and field engineering work shall conform to the Technical Specifications.

The County shall identify existing control points and property line corner stakes, as indicated on the Drawings. Benchmarks, baselines, property boundaries, line and grade hubs, and other reference and construction points shall thereafter be maintained by the Contractor who shall be responsible for keeping their accuracy and who shall pay all costs of re-establishing them if they are disturbed.

The Contractor shall notify the Contract Administrator in writing at least ten (10) days prior to the time he will commence work on any part of the construction requiring surveys to be commenced by the County.

Section 16.03. CLEARING OBSTRUCTIONS.

Unless specified otherwise, the Contractor shall clear all obstructions and prepare the site for the construction. The Contractor shall verify all dimensions and levels shown on the Drawings against the Site after it has been graded and prepare for construction, and properly reset all survey control points and property line corner stakes.

Section 16 04. LAYOUT WORK.

The Contractor shall be responsible for all layout work, and shall lay out all lines, corners, levels and grade stakes after the Site has been prepared. The exact locations of all partitions shall be laid out on forms, walls and flooring, as the Work progresses. It is the Contractor's responsibility to verify all dimensions shown on the Drawings before layout of the Work, and to properly locate the Project on the Site and the components within the structure, as specified by the Contract Documents.

Section 16.05. CONTRACTOR'S EQUIPMENT.

The Contractor shall provide adequate and suitable equipment and means of construction to meet all the requirements of the Contract Documents, including completion of the project within the time specified. The Contractor alone shall be responsible for the safety, adequacy, and efficiency of his plant, equipment and methods, and those of all subcontractors on the Site. By entering the Agreement for Construction, the Contractor agrees to provide all specialized plant, equipment and methods of construction required to perform the Work on schedule, whether separately specified or not, at no extra cost to the County.

Section 16.06. DISCOVERY OF UNKNOWN CONDITIONS; PROCEDURE.

Should concealed or unknown conditions be encountered in the performance of the work below the surface of the ground or in existing structures on the Site, which conditions are at variance with the Contract Documents, the Contractor immediately shall seek a Clarification from the Contract Administrator, pursuant to Section 4.08 hereof.

The Contract Administrator shall investigate, and if the Contractor has demonstrated the following, a Change Order shall be processed pursuant to Article 17:

A. The conditions are at variance with the Contract Documents; and,

B. The conditions require work beyond the Scope of the Agreement for Construction; and,

C. The conditions differ materially and substantially from conditions normally encountered and generally recognized as inherent in work of the character of the Project in the area of the Project Site; and

D. The Contractor has provided Notice of its claim as required by Section 17.05.

Time extensions necessitated by concealed conditions are governed by Section 3.07-D.

No claim for extra compensation or time for conditions described herein shall be allowed unless the Contractor has given the notice required by this Section and/or Section 3.08 hereof (regarding Notice of Delay). (See also: Section 4.04 regarding Site Conditions).

Section 16.07. EQUIPMENT AND METHODS.

Only equipment and methods suitable to produce the quality of Work required to conform to the Technical Specifications shall be permitted by the Contractor to operate on the Work. If any part of the Contractor's plan, equipment or methods of execution of the Work are determined by the Contract Administrator to be nonconforming to applicable safety regulations or to be non-conforming to applicable Technical Specifications, the Contract Administrator may order the Contractor to conform to the applicable requirements, and the Contractor shall promptly comply with such orders; provided, however, that neither compliance with such orders nor failure by the Contract Administrator to issue such orders shall relieve the Contractor from his obligation to perform the Work as required by the Contract Documents.

Section 16.08. TEMPORARY FACILITIES AND SERVICES.

The Contractor shall be responsible for providing and maintaining all necessary storage places, field offices, temporary roads, fences, and all utilities, including telephone, electric, gas and water service to the Site during construction at his sole cost and expense unless otherwise specified in the Technical specifications. The Contractor shall not connect to fire hydrants for construction water without the prior consent of the fire department with jurisdiction,

The Contractor shall comply with all requirements of Federal and State law and Yolo County Ordinances regarding the placement of temporary facilities on the Site, and the County shall not be deemed by this Agreement to have consented to such placement.

Section 16.09. COORDINATION OF WORK.

The Contractor shall be responsible for coordinating the work of the various subcontractors and trades employed on the Work. He shall adjust, correct, and coordinate this work with the work of others so that no discrepancies will result nor unnecessary delays occur.

If completion is delayed because of any acts or omissions of any subcontractors, the Contractor shall on that account have no claim against the County for extra compensation or time.

Section 16.10. JOINING WORK.

Where work of one trade or subcontractor joins or is installed upon the work of another trade or subcontractor, there shall be no discrepancy in mating or joining such work, which shall be done and finished in a good and workmanlike manner. In joining one kind of work with another, the marring or damaging of either shall be corrected at no expense to the County.

Should improper work of any trade be covered by that of another, it shall be the Contractor's responsibility to correct the improper work and to adjust costs between the various subcontractors, without cost to the County.

Section 16.11. CUTTING AND PATCHING OF WORK.

The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the work or to make its several parts fit together properly.

The Contractor shall not damage or endanger any portion of the Work or work being done by the County or any separate contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the County or any separate contractor except with the written consent of the Contract Administrator and of such separate contractor. The Contractor shall not unreasonably withhold from the County or any separate contractor his consent to cutting or otherwise altering the Work.

Section 16.12. INSPECTION OF THE WORK OF OTHER CONTRACTORS.

It shall be the duty of the Contractor and all subcontractors, before beginning any work, to examine all construction and work of other contractors and/or subcontractors that may affect their work, and to satisfy themselves that everything is in proper condition to receive such work.

Section 16.13. COMBINATION OF WORK WITH OTHER CONTRACTORS OR COUNTY.

If the Project requires performance of work by the County or other Prime Contractors, as specified in the supplementary Conditions, the following provisions shall apply:

A. The County reserves the right to perform work related to the Project with its own forces, and/or to award separate contracts in connection with other portions of the Project or other work on the Site.

B. When separate contracts are awarded for different portions of the Project or other Work on the Site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Agreement for Construction.

C. The County will provide for the coordination of the work of its own forces and of each separate contractor with the Work of the Contractor, who shall cooperate therewith as provided below.

D. The Contractor shall provide the County and separate contractors reasonable opportunity for the storage of their materials and equipment and the execution of their work on the site and shall connect and coordinate his Work with theirs as required by the Contract Documents. The Contract Administrator may designate separate areas on the Site for the use of separate contractors.

E. If any part of the Contractor's Work depends for proper execution or results upon the work of the County or any separate contractor, the Contractor shall, prior to proceeding with the Work, promptly report to the Contract Administrator any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor to report shall constitute an acceptance of the County's or separate contractor's work as fit and proper to receive his Work, except as to defects that may subsequently become apparent in such work by others.

F. Any costs caused by defective or ill-timed work shall be borne by the party responsible, therefore.

G. Should the Contractor unintentionally cause damage to the Work or property of the County, or to another contractor's work on the site, the Contractor shall, upon notice from the Contract Administrator, promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues or initiates a legal proceeding against the County on account of any damage alleged to have been caused by the Contractor, the County shall notify the Contractor who shall defend such proceedings, and if any judgment or award against the County arises therefrom, the Contractor shall pay or satisfy it and shall reimburse the County for all attorneys' fees and court or legal costs which the County has incurred.

H. If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up, the County may clean-up and charge the costs thereof to the contractors responsible therefore, as determined by the Contract Administrator.

Section 16.14. OVERTIME AND HOLIDAY WORK.

The Contractor shall secure the approval of the Contract Administrator before allowing work on the Project before 6:00 A.M. or after 6:00 P.M. on any working day, or any work on weekends or legal holidays.

The Contract Administrator may deny permission for such work, or impose conditions thereon, if needed to protect adjacent properties or land uses from noise, dust, or other work-related impacts not normally expected in the area during the terms proposed for such work. The Contract Administrator may consult with all governmental agencies with jurisdiction before responding to such requests.

The Contractor shall reimburse the County for all added costs to the County resulting from overtime and holiday work not specified by the Contract Documents, including Project Management and inspections by County employees and/or independent contractors, Project Architect cost increases, and any costs claimed

by any other contractor. Such reimbursement shall be made from the next progress payment due to Contractor.

Section 16.15. PROOF OF COMPLIANCE WITH CONTRACT DOCUMENTS AND LAW.

In order that the Contract Administrator may determine compliance with the requirements of the Contract Documents and applicable laws and regulations which are not readily ascertainable through inspection and tests of materials and work, the Contractor shall, at any time requested by the Contract Administrator, submit such documents or other satisfactory proofs as required by the Contract Administrator to demonstrate compliance by the Contractor with the Contract Documents and applicable laws and regulations.

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ARTICLE 17.

CHANGE ORDERS; WORK AUTHORIZATIONS; ALLOWANCES.

Section 17.01. NO CHANGES WITHOUT CONSENT; PERFORMING WORK ORDERED.

No extra work shall be performed, and no change shall be made, except pursuant to a written Change Order or Work Authorization from the County stating that the extra work or change is authorized, and no claim for any addition to the Contract Price or Time for completion shall be valid unless so ordered; provided, however, that nothing in this Article shall excuse the Contractor from diligently proceeding and fully completing the Project.

Section 17.02. CHANGE ORDERS AUTHORIZED; PROCEDURE.

A. **Change Orders Authorized**. Subject to legal requirements relating to competitive bidding, the County may require changes in, additions to, or deletions from the scope of the work to be performed or the materials to be furnished pursuant to the Contract Documents.

B. **Methods of Calculation**. Adjustments, if any, to the Contract Price by reason of any such change, addition or deletion, shall be determined by one or more of the following methods, at the County's sole discretion. The Contractor shall provide sufficient substantiating data to allow the County to evaluate the Contractor's claim for a Change Order.

1. By a lump sum proposal from the Contractor accepted by formal action by the County; and/or

2. By unit prices contained in the Contractor's original bid and incorporated in the Contract Documents or fixed by subsequent agreement between the County and the Contractor; and/or

3. By time and materials charges if approved by formal action of the County, limited to the "Actual Cost" to perform the Work, as defined by Paragraph "D" of this Section, plus overhead and profit as allowed by Paragraph "C" of this Section.

4. If the Change Order implements an Allowance procedure, the Contract Price adjustment shall be as specified in the Allowance.

C. **Overhead and Profit on Change Orders**. The maximum amount allowable on any change order for overhead and profit shall not exceed the following:

1. For change order work performed by the prime contractor, the maximum amount for overhead and profit shall be the following percentages of the "actual cost to perform the work" as defined in Paragraph D of this Section, plus a maximum of 1% of such costs for extra bond premiums, upon submission of a paid invoice for such premiums:

   a. If the change order is up to $1,000.99, 20%;

   b. If the change order is up to $1,001.00 and $4,000.99, 15%;

c. If the change order is between $4001.00 and $12,000.99, 12%;

d. If the change order is $12,001.00 or more, 10%.

2. For change order work performed by subcontractors, the maximum amount for all subcontractors' overhead and profit shall not exceed the percentages set forth in Subparagraph (1) above. The prime contractor may add 5% for the prime contractor's overhead and profit, and 1% for bond premiums if a paid invoice for extra bond premiums is submitted, both percentages being of the "actual cost" as defined in Paragraph B.

3. The allowances for overhead and profit as enumerated in the preceding subparagraphs shall include full compensation for any and all items of overhead including superintendence, layout, field engineering, and any related work, whether or not included within the definition of "actual cost" specified in Paragraph D.

D. **"Actual Costs" Defined**. The actual cost to perform the Work for purposes of this Section is limited to the applicable labor rates set forth in Article 12 hereof, including Contractor's contributions directly attributable to the Work authorized; and the material man's or supplier's invoice amount for all material and equipment actually used to accomplish the work authorized. All other direct and indirect costs, all costs attributable to the time needed to perform the work ordered by such Change Orders, and all profit associated with such work shall be included in the maximum overhead and profit amounts stated hereinabove.

E. **Audit and Verification**. All Change Order claims are subject to examination and audit before payment, if ordered by the Contract Administrator. If requested by the Contract Administrator, the Contractor shall furnish a detailed itemized breakdown and copies of all invoices for all costs being claimed for such Change Order, prior to the Contract Administrator's decision thereon. The Contract Administrator may order a more detailed audit of the Contractor's claim and supporting documentation if necessary to decide the claim.

F. **Deductive Change Orders**. If a Substitution, Field Order, Work Authorization, or Change Order is issued which reduces either the Scope of the Contract, the cost to perform the Work, the time to perform the work, or any combination thereof, the County shall be credited therefore on a Change Order. The credit shall be calculated in the same method as an extra-work Change Order. The Contractor shall submit time and materials data for approval by the Contract Administrator detailing the credit due the County. The County reserves the right to verify such data by reference to standard estimating manuals, the Contractor's Schedule of Values, or other documents, and to review the Contractor's estimate of the credit due.

G. **Periodic Change Orders**. The Contract Administrator is authorized to cumulate Work Authorizations and to process periodic Change Orders including additions and deletions, and to develop procedures providing the methods for such processing in addition to and consistent with those set forth in Division l.

Section 17.03. WORK AUTHORIZATIONS; PROCEDURE.

A. **Work Authorization Authorized**. The Contract Administrator or the County Administrative Officer, depending on amount, is authorized to issue Work Authorizations instructing the Contractor to proceed with extra work subject to the following maximum amounts, above which a Change Order must be approved by the Board of Supervisors.

B. **Maximum Amounts**. Work Authorizations may be issued by the Contract Administrator up to $2,000.99, and by the County Administrative Officer up to $25,000, maximum price adjustment authorized thereby. Either may approve a time allocation for such work, subject to the procedure and limitations specified in Section 3.07-D.

C. **Quotation by Contractor**. Other than in extraordinary circumstances as described below, before a Work Authorization is issued the Contractor shall submit a quotation setting forth an estimated cost of the extra work to be performed with sufficient substantiating data to allow the County to evaluate the quotation, and an estimate of the time necessary to perform the extra work. If requested by the Contract Administrator, the Contractor shall provide additional data to support the quotation. The Contractor shall acknowledge the quotation as binding.

D. **Claim for Price Adjustment**. After the extra work specified on the Work Authorization is completed, the Contractor may submit a claim for a Contract Price Change Order due to the Work Authorization. The claim shall be supported with substantiating data to show the actual costs to perform the Work and the overhead and profit being claimed, as defined in Section 17.02 C and D. The maximum price adjustment claimed shall not exceed one-hundred-ten (110%) percent of the approved quotation.

E. **Claim for Time Adjustment**. If the Contractor claims that the Work Authorization has delayed the Contract Completion Time, he shall verify the claimed delay by demonstrating with reference to the approved Project Progress Schedule that the Work Authorization in fact caused a delay in the overall completion date of the Project. Upon such demonstration, the Contract Administrator shall process a request for a Contract Time extension Change Order pursuant to Article 3 hereof.

F. **Accumulation of Work Authorizations**. At the Contract Administrator's sole discretion, the Contractor's claims for change Orders arising from several Work Authorizations may be accumulated into periodic Change Orders adjusting Contract Price, Time, or both, separately or in one Change Order.

Such periodic Change Orders shall include deductions for Changes that constitute Deductive Change Orders, as defined in Section 17.02-F during the time period being considered in the periodic Change Order.

G. **Immediate Work Authorizations**. In the event extraordinary circumstances arise which require extra work to be authorized before a quotation is prepared by the Contractor, the Contract Administrator or County Administrative Officer may issue an immediate Work Authorization without such quotation. Such Work Authorization shall include a maximum authorized sum over which no price adjustment will be authorized. The determination as to whether circumstances as

described above exist is discretionary with the County. Such Work Authorizations otherwise shall be processed as specified in this Section.

Section 17.04. EXTRA WORK CLAIMS; PROCEDURE.

If the Contractor claims that any Clarification or other instruction issued by the County requires work beyond the scope of the Agreement for Construction, the following provisions shall apply:

A. **Notice to Contract Administrator**. The Contractor shall notify the Contract Administrator of its claim, and submit a quotation for the claimed costs, in the same manner as specified in Section 17.03-C. The Contractor shall submit additional information requested by the Contract Administrator to decide the claim.

B. **Action by Contract Administrator**. The Contract Administrator shall review the Contractor's submittals and either approve or deny the Contractor's claim. The Contract Administrator shall issue his decision within twenty-one (21) days of receipt of a complete submittal from the Contractor. If the claim is approved, the Contract Administrator may process either a Change Order or Work Authorization, pursuant to this Article. If the claim is denied, the Contract Administrator shall so advise the Contractor. Thereafter, the Contractor shall proceed with the work in issue.

C. **Time**. If the claim is approved, the time during which the claim was being considered shall be included in the time allocation for the Work Authorization adjusting the claim, and Section 17.02 shall apply thereto; if the claim is adjusted by Change Order, any Time extension authorized thereby shall include the time during which the claim was pending. If the claim is denied, no time adjustment shall be authorized.

D. **Effect of Proceeding**. If the Contractor proceeds with the work without notifying the Contract Administrator pursuant to Paragraph A, or before a decision pursuant to Paragraph B, any claim for a Contract price and/or time adjustment shall be waived.

E. **Scheduling**. The Contractor is responsible to schedule the work and submit extra-work claims so the time required for decision, as specified in Paragraph B, does not delay the Work in general.

Section 17.05. ALLOWANCES; PROCEDURE.

The Contractor's bid includes the amounts specified for Allowances in the Contract Documents. Work or materials specified as included in the Allowance shall be provided by the Contractor for the Allowance amount.

The County reserves the right to specify work and/or materials which differ from those specified as included in the Allowance, in which case additive or deductive changes to the Contract Price shall be processed pursuant to this Section.

Unless otherwise expressly specified in the Contract Documents, the following provisions shall control the Price adjustment for the Allowance:

A. The Contract Price bid by the Contractor shall include the cost for the Allowance item(s), delivered to the Site, unloading, handling, storage, taxes, and all overhead and profit pertaining thereto. If the

Allowance is specified as including labor, the Contract Price bid by the Contractor shall include all costs of such labor, including superintendence, overhead and profit.

B. If the County orders item (s) or labor different from those specified as included in the Allowance, the Contract Price shall be adjusted by either a deductive or additive Change Order pursuant to Section 17.02, or a Work Authorization pursuant to Section 17.03.

C. Unless another method is specified by the Allowance, the price adjustment shall be based upon the following:

1. The actual costs of the items ordered by the County, delivered to the Site and made ready for incorporation in the Project shall be compared to the material cost specified in the Allowance. "Actual costs" is defined by Section 17.02-D.

2. The actual costs of labor to incorporate the items ordered by the County in the Project shall be compared to the labor amounts specified in the allowance, if any. "Actual Costs" is defined by Section 17.02-D.

3. The results of the materials and labor adjustments shall then be compared. If the net adjustment resulting from this comparison is additive, the Contractor shall be entitled to overhead and profit as specified by Section 17.02-D only on the net amount resulting from the previous calculations. Such overhead and profit shall include all sums authorized for all indirect costs associated with the Allowance, including materials, shipping, handling, unloading and storage and labor superintendence. If the net adjustment is negative, nothing shall be deducted for overhead and/or profit.

4. The resulting adjustment shall either be reflected in a separate Change Order or cumulated in a periodic Change Order, at the Contract Administrator's sole discretion.

5. Any Contract Time adjustment claimed by the Contractor shall be subject to Section 3.07.

Section 17.06. MINOR CHANGE ORDERS BY COUNTY ADMINISTRATIVE OFFICER.

The Yolo County Board of Supervisors has authorized the County Administrative Officer to order changes or additions in the work being performed under construction contracts, pursuant to Public Contracts Code Section 20142,

This authorization allows any change or addition in the Work to be ordered in writing by the County Administrative Officer when the extra cost to the County does not exceed the sum of TWENTY-FIVE-THOUSAND DOLLARS ($25,000) plus 5% of the amount of the contract in excess of $250,000.00, up to 10% of the Contract Price, whichever is less.

Section 17.07. CHANGE ORDERS REGARDING TIME FOR COMPLETION.

Any time extension authorized by the County pursuant to Article 3 hereof shall be set forth in a Change Order issued by the County Administrator.

Section 17.08. CHANGE ORDERS DUE TO UNAVAILABLE MATERIALS.

In the event that the Contractor demonstrates good cause for a delay in the Contract Time due to the unavailability of materials, the County, in its sole discretion, may either grant a Contract Time extension change order pursuant to Section 3.07-A hereof, or utilize this Section.

In the event that the Project is unable to be completed due to unavailable materials, and if the Project is complete otherwise, the Contractor may request to delete the portion of the Project not yet completed from the Agreement for Construction, thereby allowing a Notice of Completion to be filed on the remainder of the Project. The County shall approve no such Change Order unless the Contractor accompanies his request with an offer to perform the work so deleted for a price not to exceed the value of the work deleted by such Change Order, such work to be commenced upon delivery of the materials, and diligently prosecuted to completion. In the event the County elects to accept the Contractor's offer, work done pursuant thereto shall not be construed as work done on the Project, nor shall such work be construed as affecting, in any way, the legal significance of the Notice of Completion filed on the Project.

The application of this Section is limited as follows:

A. No Change Order shall be issued pursuant to this Section until the Contractor has submitted all documents required for final payment.

B. This Section shall apply only to work the Completion of which is precluded due to unavailable materials.

C. Utilization of this Section lies solely within the discretion of the County, and such discretion hereby is delegated to the Contract Administrator.

Section 17.09. EFFECT OF CONTRACTOR'S ACCEPTANCE OF CHANGE ORDER.

By acceptance of a Change Order, Contractor agrees to the changes, if any, in the Contract Price specified for each item and to the specified extension of Time allowed, if any, for completion of the entire work on account of such Change Order, and agrees to furnish all labor and materials and perform all work necessary to complete all additional work specified therein for the price adjustment and within the time specified therein. Contractor shall make no additional claim for adjustment to the Contract Price or Time, nor for additional costs or damages, on account of the Work referenced in such Change Order. A Change Order duly issued by the County and accepted by the Contractor shall constitute a complete accord and satisfaction as to the Work, Contract Price and Contract Time changed thereby. Contractor shall defend and indemnify the County, as required by section 2.05, if any subcontractor asserts any claim against the County due to a duly issued and accepted Change Order.

Section 17.10. EFFECT ON SURETIES.

All changes authorized by the Contract Documents may be made without notice to or consent of the sureties on the performance and payment bonds and shall not reduce their liability on the bonds.

The County reserves the right to require additional performance and payment bonds to secure a Change Order. In this event, the Change Order shall be increased by the actual cost of the bond premium for the additional bond amounts, if any, up for a maximum of 1%.

ARTICLE 18.

INSPECTION.

Section 18.01. ACCESS FOR INSPECTION.

The Contract Administrator, the Project Architect, the County Inspector(s), and other designated employees or agents of the County, and inspectors of all agencies of jurisdiction over the Project or funds used for the Project shall at all times have access for the purpose of observation to all parts of the Work and to all shops wherein the Work is in preparation. The Contractor shall cooperate and furnish such facilities and assistance as needed for the Inspector(s).

Sections 18.02. NOTICE OF READINESS FOR INSPECTION.

Where the Contract Documents, instructions by the Contract Administrator, laws, ordinances, or any public authority having jurisdiction requires work to be inspected, tested or approved before any portion of the Work proceeds, such work shall not proceed, nor shall it be covered up without inspection.

The Contractor shall give notice to the Contract Administrator at least two (2) days in advance of the readiness for any Contract compliance inspection by the County Inspector. The Contractor shall give notice as required by all other inspection agencies of jurisdiction for Code and regulation compliance inspection. In all cases, the Contractor shall schedule inspection so as not to delay the Work.

Section 18.03. CONTRACT COMPLIANCE INSPECTIONS.

All work done and all materials furnished shall be subject to the inspection and approval of the Contract Administrator for compliance with the Contract Documents, either acting personally or through the County Inspector(s).

Any work covered without required inspection, or not in compliance with the Contract Documents or instructions to the Contract Administrator, shall, upon the instruction of the Contract Administrator, be uncovered for inspection and properly restored after inspection and approval, at no cost to the County.

Section 18.04. INSPECTION OF COMPLETED WORK.

Should the Contract Administrator determine that it is necessary or advisable to make an inspection of Work already completed and inspected at any time before final inspection and acceptance of the Project, by removing or exposing the Work, Contractor shall, upon instruction of the Contract Administrator, promptly furnish all necessary facilities, labor and materials to do so. If such work is found to be defective in any aspect, the Contractor shall bear all expenses of such examination and satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract Documents, the additional cost of labor and materials necessarily involved in the examination and replacement shall be allowed the Contractor, and a Change Order shall be issued.

This Section shall not apply in the case of Work covered without required inspection, which is governed by Sections 18.02 and 18.03.

Section 18.05. AUTHORITY OF COUNTY; STOP WORK NOTICES.

The Contract Administrator and the County Inspector shall have the authority to order the Work stopped if either determines that the Work is proceeding in violation of the Contract Documents or any orders issued by the Contract Administrator. Such order shall be effective only upon the posting of a stop work notice upon the Work or portions of the Work in question.

Upon issuing a stop work notice, the County Inspector shall immediately notify the Contract Administrator, who shall inspect the Work in question and determine whether it does or does not comply with Contract Documents. The decision of the Contract Administrator shall be final. The Contractor shall thereafter comply with the instructions of the Contract Administrator regarding corrections needed to cure the defect. The stopped Work shall be resumed only when such instructions are fulfilled, and a resume work notice is issued by the Contract Administrator. The Contractor shall not be entitled to an extension in time in the event of such suspension of Work, except as authorized in Section 3.14 hereof.

Section 18.06. EFFECTS OF INSPECTIONS.

Neither the final inspection and payment, nor any interim inspection or progress payment shall relieve the Contractor of any obligation to fully perform the Agreement for Construction as required by the Contract Documents and all applicable laws and regulations.

Any work, materials, or equipment not meeting the requirements and intent of the Contract Documents and all applicable laws and regulations may be rejected, and suitable work or materials shall be made good, notwithstanding the fact that such work or materials may previously have been inspected and/or payment therefore may have been made.

Section 18.07. AUTHORITY OF CONTRACT ADMINISTRATOR.

The Contract Administrator shall decide all questions which may arise as to the quality or acceptability of materials and/or equipment furnished or work performed, and as to the interpretation of Contract Documents and Specifications; all questions as to the acceptable performance of the Contract; and all questions as to compensation.

Section 18.08. AUTHORITY OF COUNTY INSPECTOR(S).

The designated County Inspector is a representative of the Contract Administrator for purposes of inspection of the work for compliance with the Contract Documents and monitoring the Contractor's performance. He is authorized to order a cessation of non-complying Work pursuant to Section 18.05, and to certify the field copies of the Contractor's requests for progress payments. He conducts meetings as required by the Technical Specifications and generally monitors the contractor's performance for the Contract Administrator.

If a person or firm other than the Construction Manager is engaged as County Inspector, the Inspector is not authorized to bind the County in discussions with the Contractor, nor to issue Clarifications, Field Orders, Work Authorizations, or Change Orders.

No interpretations of the Contract Documents made by the Inspector are binding on the County unless the Contract Administrator adopts such interpretation by a written clarification.

The Contractor shall not attempt to influence the Inspector in the performance of his duties, nor request him to exceed his authority. The County shall honor no request by the Contractor that is based on any action of the Inspector beyond the scope of the Inspector's authority as specified in this Section.

Section 18.09. BUILDING INSPECTIONS AND CODES.

The Contractor shall provide access to inspectors from all agencies having jurisdiction over the Project.

Such inspectors are independent of the Contract Administrator and the County Inspector(s), and approval by either shall not constitute approval by the other.

The Contractor shall obey all orders of the inspectors with jurisdiction, and if such inspector reports a violation of any Code within his jurisdiction, the Contractor immediately shall notify the Contract Administrator.

The Contractor is responsible to comply with all applicable Codes in the construction of the Work.

ARTICLE 19.

PUBLIC UTILITIES.

Section 19.01. UTILITIES USED DURING CONSTRUCTION.

Unless otherwise specified in the Contract Documents, the Contractor shall provide and pay for all necessary water, gas, and electricity required for himself, and all trades employed in the performance of the Agreement for Construction.

The Contractor shall send all required notices, make all necessary arrangements, and perform all other services required in the care and maintenance of such utilities, and assume all financial responsibility concerning the care and maintenance of said utilities.

All temporary connections to such utilities shall be maintained in such manner as not to interfere with the continuing use of such utilities by the County during the entire progress of the Work.

The enclosing of such public utility equipment shall be done by the Contractor consistent with the requirements of the utility. Upon completion of the Work, the Contractor shall remove all enclosures and fill-in and leave in a finished condition all openings for such utilities.

Section 19.02. LIGHTING.

Contractor shall furnish, wire for, install and maintain temporary electric light whenever it is necessary to provide illumination for the proper performance and inspection of the Work, unless otherwise specified. The lighting shall provide sufficient illumination and shall be so placed and distributed that the Contract Documents can be easily read in every place where the Work is being performed. This temporary lighting equipment may be moved about, but shall be maintained throughout the Work and available for the use of the Contract Administrator or County Inspector(s) whenever required for inspection.

Section 19.03. PERMANENT UTILITIES; INSTALLATION.

The Contractor shall install all permanent utilities called for by the Construction Documents strictly in compliance with all laws, regulations and requirements of the particular utility company or governmental agency providing the utility.

Section 19.04. TOILET FACILITIES FOR WORKERS.

The Contractor shall provide and maintain for the duration of the Work temporary toilet facilitates as required by the Yolo County Health Department, which shall be weather-tight structures with raised floors.

The Contractor shall service such facilities daily and shall pump such facilities as required, to maintain them in a clean and sanitary condition.

Section 19.05. DISRUPTION OF UTILITY SERVICE.

The Contractor shall secure the advance approval of the Contract Administrator regarding scheduling of any disruption of utility service to other structures necessitated by the Work.

The Contractor is advised that unscheduled disruptions of electrical service to County buildings may seriously damage computer and word-processing equipment and/or software, and other equipment and/or material in use in such building, and the Contractor will be liable for all resulting repair and re-programming costs if occasioned by an unscheduled disruption caused by Contractor.

Section 19.06. UTILITIES FOR COUNTY PERSONNEL.

If the Contract Documents call for the Contractor to provide temporary on-site office trailers for County personnel involved in the Project, the Contractor shall provide utility services for such trailers pursuant to this Article.

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ARTICLE 20.

PERMITS, LICENSES, ORDINANCES AND REGULATIONS.

Section 20.01. COMPLIANCE WITH CONSTRUCTION REGULATIONS.

The Contractor shall conduct the Work so that all laws, regulations, and ordinances for the protection of the public and the workers shall be obeyed fully both by the Contractor and by all subcontractors on the site.

The Contractor shall obtain and keep current all licenses or permits required by the State Contractor's Licensing Act and/or other licenses required to authorize him to perform the Work and shall require all subcontractors to comply with this section.

Section 20.02. PERMITS; FEES.

Unless otherwise specified by the Contract Documents or ordered by the Contract Administrator, the Contractor shall obtain all permits, licenses and/or entitlements that are required for the performance of the Work by all laws, ordinances, rules, and regulations or orders of any officer and/or body with jurisdiction, shall give all notices necessary in connection therewith, and shall pay all fees required relating thereto and all costs or expenses incurred on account thereof.

Section 20.03. COMPLIANCE WITH LAWS AND REGULATIONS.

The Contractor shall keep himself fully informed of and shall observe and comply with, and shall cause all subcontractors and all employees to observe and comply with all Federal and State laws, and County or Municipal Ordinances, regulations, orders or decrees which in any manner affect those engaged or employed on the Work, or the materials used in the Work, or in any way affect the conduct of the Work. The Contractor shall ensure that the Work is constructed and completed in compliance with all applicable laws and regulations.

Section 20.04. VIOLATION OF LAWS AND REGULATIONS; INDEMNITY.

The Contractor shall save harmless, defend, and indemnify the County and all of its officers, agents, and employees against any liability or claim arising from or based upon the violation of any law, ordinance, regulation, order or decree, whether by himself, his agents, employees, or his subcontractors or their agents or employees.

Section 20.05. SPECIFIC STATE LAWS AND REGULATIONS.

In addition to the general requirements set forth above, the Contractor's attention is directed to and Contractor shall be responsible for performing and completing the Work in compliance with all laws of the State of California governing the construction of buildings in general as well as those governing construction of public buildings, including, without limitation, the following:

A. The California Health & Safety Code and all applicable Administrative Code regulations adopted pursuant thereto.

B. All laws governing the employment of labor, qualifications for employment of aliens, payment of employees, convict-made materials, domestic and foreign materials, and accident prevention.

C. Title XIX of the California Administrative Code entitled, "Public Safety", Chapter 1, State Fire Marshal, Sub-chapter 12, General Fire and Panic Safety".

D. General Industrial Safety Orders, including but not limited to the provisions of Title VIII of the California Administrative Code relating to safe and proper use, construction, disposal, etc. or materials, machinery, and building appurtenances as therein set forth.

E. All rules and regulations of the State Fire Marshall; the safety orders of the Division of Industrial Safety; and Department of Industrial Relations regulations.

All of the above laws and regulations are expressly incorporated in the Agreement for Construction and are as much a part of the Contract Documents as if they were incorporated in their entirety in these General Conditions.

The Contractor shall not interpret the enumeration set forth above as being a complete listing of all applicable laws. It is also the Contractor's responsibility to inform himself regarding the requirements of all applicable laws regarding the performance of construction contracts for California counties and to obey them, and the Contractor agrees by execution of the Agreement for Construction to do so at his sole cost, expense and risk. (See also Section 14.07 regarding Cal OSHA and Section 20.08 regarding hazardous materials).

Section 20.06. COMPLIANCE WITH CONDITIONS OF PERMITS.

The Contractor shall conduct the Work in conformity with the conditions imposed on all permits or other entitlements which address the performance of the Work by the Contractor, whether or not such permits or entitlements are incorporated in the contract Documents.

Such permits may include, but are not limited to, measures required during the construction of the Work and incorporated in the Project to avoid or mitigate the environmental effects of the Project, pursuant to the California Environmental Quality Act, and conditions imposed on use permits issued by any agency with jurisdiction.

It shall be the Contractor's responsibility at all stages, from bidding through final completion, to inform himself of the requirements of any such permits. Copies are available from the Contract Administrator.

The Contractor's attention is directed to the Supplementary Conditions and Technical Specifications setting forth additional requirements, if any, regarding this subject.

Section 20.07. COMPLIANCE WITH CONDITIONS OF GRANTS.

The Contractor shall conform to all requirements of Federal and/or State authorities that have provided grant funding for the Project. Specific requirements are specified in the Supplementary Conditions and Contract Documents. Without limitation thereof, Contractor shall keep financial, wage and hours, equal employment opportunity and other records required by any such grant and shall allow access to the Site by inspectors from such agencies.

The Contractor shall cooperate fully with and assist the County in its efforts to comply with all conditions imposed on such grant funding.

Section 20.08. HARMONIZATION WITH CONTRACT DOCUMENTS.

The Contract Documents are intended to be coordinated to described and provide for the complete Project in a manner that complies with all applicable laws and regulations.

In the event of a conflict between the Contract Documents and the applicable laws and regulations, the applicable laws and regulations shall govern; provided, however, that in the event of conflict involving quantity or quality, the greater quantity and the higher quality shall be furnished. All other conflicts shall be handled in the manner described in Section 4.02 of these General Conditions.

Section 20.09. COMPLIANCE WITH HAZARDOUS MATERIALS REPORTING AND USE REQUIREMENTS; CLEAN-UP; INDEMNITY; WITHHOLD.

A. **Reporting and Use**: The Contractor shall file all reports required by Federal and/or State agencies regarding the presence on the Site and/or use of toxic or any hazardous material and shall store and/or use such materials in strict conformity with all applicable laws and regulations.

B. **Clean-Up**: The Contractor shall clean-up any toxic or hazardous spill or pollution caused by the Contractor and/or any subcontractor, material man or carrier occurring on the Site, and shall remove all polluted water, dirt or materials to an approved disposal site, as required by the Federal and/or State agencies with jurisdiction or, if none, by the County Health Department, all without cost to the County.

C. **Indemnity**: The Contractor shall save harmless, indemnify and reimburse the County for all costs for defense of any County liability, cost, claim or damages resulting from the Contractor's failure to perform Paragraphs "A" and/or "B" of this Section, and/or a toxic or hazardous spill within Paragraph "B" of this Section.

D. **Withhold**: In addition to all withholds or retentions authorized by the Agreement for Construction, the County shall retain sums sufficient to offset the County's costs resulting from Contractor's failure, refusal or neglect to conform to all requirements of this Section.

ARTICLE 21.

PRESERVATION AND CLEANING.

Section 21.01. PROTECTION OF WORK.

The Contractor shall protect and preserve the Work from all damage or accident, and shall at its cost provide any temporary roofs, window and door coverings, enclosures, boxing, or other construction as required for this purpose.

Section 21.02. PERIODIC CLEANING OF PROJECT.

The Contractor shall properly clean the Site and the Work as it progresses, and from time to time shall remove all dirt, debris, waste, rubbish, and implements of service from the Project and the Site. Debris, waste, or unused construction materials shall not be left under, in, or about the Project, nor allowed to accumulate in the Project or the Site. The Technical Specifications specify additional requirements regarding this subject.

The Contractor, at its sole cost, shall contract with a disposal company to remove all such rubbish, and shall have the containers therefore emptied at frequent enough intervals so that waste does not overflow the containers.

Section 21.03. FINAL CLEANING OF PROJECT.

Prior to the request for Final Inspection, the Contractor shall thoroughly clean the interior and exterior of the Work, and do all things required by the Technical Specifications regarding final cleaning.

Final cleaning shall not be accepted unless the Project is in all respects ready to occupy without further cleaning by County forces.

ARTICLE 22.

OCCUPANCY BY COUNTY.

Section 22.01. USE OF COMPLETED WORK.

Whenever, in the opinion of the County, the Work or any part thereof is in a condition suitable for use, and the best interests of the County require such use, the County may take possession of, connect to, and open for public or County use, the Work or any part thereof, subject to this Article.

Section 22.02. REPAIRS OR RENEWALS IN THE WORK.

Prior to the date of final acceptance of the Work by the County, all necessary repairs or renewals of the portion of the Work occupied pursuant to Section 22.01 hereinabove (or part thereof) shall be made at the Contractor's expense if necessary due to defective material and/or workmanship, or to the operations of the Contractor, ordinary wear and tear excepted.

Section 22.03. EFFECT OF OCCUPANCY.

The occupancy by the County of the Work or any part thereof as authorized by this Article shall in no case be construed as constituting acceptance by the County of the Work or any part thereof. Such use shall neither relieve the Contractor of any of his responsibilities under the Contract Documents, nor act as a waiver by the County of any of the terms or conditions of the Agreement for Construction. Notwithstanding occupancy by the County pursuant to this Article, the warranty periods on all products and the Contractor's basic warranty pursuant to Article 26 shall not commence, and the term thereof shall not be diminished, as a result of County occupancy. The warranty periods commence only upon recordation of a Notice of Cessation of Work or a Notice of Completion.

Section 22.04. COORDINATION WITH OTHER ACTIVITIES.

In the event that the Project, or any portion of the Site, is occupied by the County during the Work, it shall be the responsibility of the Contractor to conduct his operations so as not to unreasonably interfere with the use of the occupied portions by the County.

The Contractor shall submit periodic schedules to the Contract Administrator proposing the times, areas, and types of work to be done within such areas. The Contract Administrator shall approve, conditionally approve, or reject such schedule, and the Contractor shall comply with the Contract Administrator's instruction.

In the event that the Work produces conditions rendering uninhabitable the portions of the Project, the Site, or other areas occupied by the County, either because of noise, dust, vibration, smoke, fumes, or for any other cause, the Contract Administrator may order the Work ceased, or modifications to the schedule, and the Contractor shall comply at it's sole cost and expense.

Section 22.05. PRICE OR TIME ADJUSTMENTS.

In the event the County exercises its right to take early occupancy pursuant to this Article, and provided that the Contract Documents at the time of bidding did not specifically indicate the County's

intention to do so, the Contractor may request an adjustment to the Contract Price and/or Time, for extra costs and/or time directly caused by the early occupancy. Article 17 shall apply to any request by the Contractor for a Contract Price adjustment, and Article 3 to a Contract Time adjustment, resulting from the County's occupancy pursuant to this Article.

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ARTICLE 23.

PROGRESS PAYMENTS.

Section 23.01. SUBMISSION OF CLAIMS.

On or before the seventh (7th) day of each month, the Contractor shall prepare and forward to the Contract Administrator a statement in writing, on forms provided by the County, detailing the following work done during the preceding month:

A. The units or work completed during the preceding month, with reference to the Progress and Value Schedules approved pursuant to Article 3, or approved modifications thereto, and the date of inspection and approval thereof.

B. The portion of the progress claim attributable to such units of work.

C. All acceptable materials furnished and delivered to and stored on the Site or other approved location for use in the performance of the Work, but not yet incorporated in the Work.

D. The value of such materials, with reference to the Schedules of Value provided pursuant to Article 3 hereof.

E. The date of inspection and approval by the County of any such materials and labor.

If the Contract Documents require the sampling and testing of any such materials or labor, the claim shall indicate whether such sampling and testing has been approved and, if so, the date thereof.

As part of such claim for payment, the Contractor shall agree that, upon payment of such claim (or part thereof), the Contractor will indemnify, defend and hold harmless the County, its officers, agents and employees from and against any and all claims for damages, costs, compensation or any other recovery, including but not limited to claims of the Contractor, subcontractors, suppliers, laborers and workers, based upon the portion of the Work for which payment is claimed (or such part thereof for which payment is made). As part of such claim for payment, Contractor shall also provide proof that all subcontractors, suppliers, etc. have been paid and have provided releases for all portions of the Work for which the Contractor has previously been paid. Such claims shall be executed by the Contractor under penalty of perjury.

Each payment request shall be reviewed by the Contract Administrator as soon as practical after receipt for the purpose of determining that the payment request is a proper payment request. Any payment request determined not to be a proper payment request suitable for payment shall be returned to the contractor as soon as practicable, but not later than seven days, after receipt. A request returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.

Within seven (7) days of receipt of a fully completed claim form, the Contract Administrator shall verify such claim and shall take such steps as are necessary to investigate the accuracy of any statements made by the Contractor. Contractor shall provide such other and further documentation as ordered by the

Contract Administrator to enable verification of a claim for a progress payment and the time until such additional documentation is delivered shall extend the time for processing the claim.

The Contract Administrator shall verify the claims for progress payments by use of the Progress and Value schedules approved pursuant to Article 3 hereinabove, or subsequently approved modifications thereto.

Section 23.02. PAYMENT; WITHHOLDS.

Upon approval of a claim for progress payment by the Contract Administrator, such claim shall be paid; provided, however, that the following amounts shall be withheld as security:

A. No greater than Ten (10%) percent of the value of the Work done.

B. Ten (10%) percent of the value of the acceptable materials delivered to and accepted by the County, but not yet incorporated in the Work.

Within the time specified in the Contract Documents, the County shall pay to the Contractor, while the Contractor is carrying on the Work, the balance of any progress payment not withheld as set forth above, after deducting therefrom all previous payments and all sums to be retained under the provisions of law or of the Contract Documents.

No payment by the County shall be construed to be an approval by the County of any defective work or improper materials, nor as an acceptance as completed of any portion of the Work.

If the County fails to make any progress payment within 30 days after receipt of an undisputed and properly submitted payment request, the County shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

Section 23.03. POSTING SECURITIES IN LIEU OF WITHHOLDS.

Pursuant to Public Contract Code Section 22300, at the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the County, or with a state or federally chartered bank as the escrow agent, who shall pay such monies to the Contractor upon satisfactory completion of the Contract.

Securities eligible for investment under this section shall include those listed in Government Code 16430 or bank or savings and loan certificates of deposit.

The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest hereon.

The escrow agent shall be a trustee of the County.

Section 23.04. RETAINING ADDITIONAL AMOUNTS; GROUNDS.

In addition to the amounts which the County withholds as provided in Section 23.02, the County shall retain a sufficient amount of any payment otherwise due to the Contractor as in the sole discretion of the Contract Administrator may be necessary to protect the County in the event of the following:

A. The receipt of Stop Notices and Claims against the Contractor or any subcontractor for labor or materials furnished on the Project;

B. For the cost to correct defective work not remedied, including failure to periodically clean the Site and Work as specified in Section 21.02.

C. For failure of the Contractor to make progress payments to any of its subcontractors;

D. For the occurrence of reasonable doubt that the Project can be completed for the balance of the Contract Price, as reflected in the approved Schedule of Values, or within the Contract Time, as shown on the approved Progress Schedule;

E. For the refusal of the Contractor to commit sufficient resources so that the Work proceeds in accordance with the approved Progress Schedule. Section 3.11 regarding Liquidated Damages shall apply in such event;

F. For failure of the Contractor to comply with any lawful or proper direction concerning the work given by any County representative authorized to have given such instruction;

G. For claims and/or penalties which State or Federal law assesses against the Contractor for violation of such law, including prevailing wage claims;

H. For any claim or penalty asserted against the County by virtue of the Contractor's failure to comply with the provisions of all governing laws, ordinances, regulations, rules and orders;

I. For any reason specified elsewhere in the Contract Documents as grounds for retention.

In order to adequately to protect the County, the basic standard to determine the amount of retention pursuant to this section shall be ONE-HUNDRED-TWENTY-FIVE (125%) PERCENT of the amounts claimed or the value of the Work not done or defectively done, plus interest and litigation costs; provided, however, that County retains the authority to retain greater sums should such sums be necessary in the County's discretion adequately to protect it.

In the event the progress of the Work does not meet the approved Progress Schedule, the County may retain the amounts specified in Section 3.11 and Section 2 of the Agreement for Construction for each day the Work is behind schedule.

The County retains the right to make, or not to make, any partial progress payment involving sums not in dispute, or to retain the total progress payment pending resolution of any such dispute.

Section 23.05. DISBURSEMENT OF RETAINED AMOUNTS.

The County, in its sole discretion, may apply any such retained amount or amounts to the payment of any such claims resulting in a retention. Any payment, so made by the County, shall be considered as a payment made under this Contract by the County to the Contractor. The County shall not be liable to the Contractor for any such payments made in good faith. Such payments may be made without a prior judicial determination of the claim or claims. The County shall render to the Contractor a proper accounting of any such funds dispersed on behalf of the Contractor. The County reserves the right to utilize warrants issued to the Contractor and Claimant as joint payees for this purpose.

Prior to applying such amounts as stated hereinabove, County shall afford the Contractor an opportunity to present good cause, if any he has, why the claim or claims in issue are not valid or just claims against the Contractor. The County then reserves the right to take such further steps as are appropriate, in its sole discretion, including, but not limited to, seeking a judicial resolution of the controversy.

Section 23.06. CORRECTION OF STATEMENT AND WITHHOLDING OF PAYMENT.

No inaccuracy or error in any claim provided by the Contractor shall operate to release the Contractor or any surety from the error, or from damages arising from such error, or from any obligation imposed by the Contract Documents. The County shall retain the right subsequently to correct any error made in any previously approved claim for the progress payment, or progress payment issued, by later adjustments to subsequent progress payments.

Section 23.07. EFFECT OF PROGRESS PAYMENTS.

Neither the payment, the withholding, nor the retention of all or any portion of any progress payment claimed to be due and owing to the contractor shall operate in any way to relieve the Contractor from his obligations under the Agreement for Construction. The Contractor shall continue diligently to prosecute the Work without reference to the payment, withhold or retention, of any progress payment. The payment withhold or retention of any progress payment shall not be grounds for an adjustment to the Contract Time or Contract Price. By making progress payments, the County waives no right nor releases any obligation of the Contractor to the County.

ARTICLE 24.

FINAL INSPECTION.

Section 24.01. NOTICE OF FINAL INSPECTION.

When the Work is completed, the Contractor shall request a final inspection. Within ten (10) days of the receipt of such request, the Contract Administrator shall make a final inspection. The Contractor or his representatives may be present at the final inspection. The purpose of such final inspection shall be to determine whether the Work has been fully completed in accordance with the Contract Documents, including all modifications previously issued.

Section 24.02. PUNCH LIST.

The Contract Administrator shall notify the Contractor in writing of any deficiencies to be remedied prior to final acceptance, by preparing a written list of deficiencies, known in the industry as a "punch list".

The Contractor shall remedy all items shown on the punch list prior to final acceptance by the Contract Administrator.

The Contract Administrator is not authorized to amend the Contract by use of the punch list; it is provided solely for the benefit of the Contractor to enable him to determine whether items must be corrected before final acceptance will be recommended by the Contract Administrator. The County reserves the right to require compliance with the Contract Documents, notwithstanding the issuance of a punch list or the completion by the Contractor of all items on the punch list.

In the event that the Work still does not comply with the Contract Documents, the County reserves the right to issue such further punch lists as may be required, or to deduct from the final payment the cost of correction of any Work not completed in accordance with the Contract Documents without the issuance of further punch lists.

Section 24.03. ADDITIONAL SUBMITTALS.

After completion of work on punch list items, and before the Contractor's Request for Final Payment, the Contractor shall submit the following items:

A. A complete and accurate accounting, showing the total amounts claimed by the Contractor, all subcontractors and all suppliers due for final payment of the Project. The accounting shall identify first-tier subcontractors (those with a contract directly with the contractor) separately from all other claimants and shall include all subcontractors listed by the Contractor pursuant to Article 11. This accounting shall be submitted under penalty of perjury.

B. A complete and accurate set of Record (as-built) Drawings prepared by the Contractor pursuant to Section 4.05 and the Technical Specifications.

C. The Contractor's guarantee required by Article 26 hereof, and all other guarantees and warranties required by the Contract Documents.

D. The Contract bond securing the Contractor's guarantee pursuant to Article 26 hereof.

E. Proof acceptable to County of proper release from all claims regarding patents and/or copyrights pursuant to Section 6.09 hereof.

F. All operating manuals required by the Technical Specifications for all mechanical and electrical installations.

G. All other submittals required by the Contract Documents prior to final payment.

Section 24.04. SYSTEMS DEMONSTRATION.

Before submitting a Request for Final Payment, Contractor shall demonstrate the operation of all systems in the Work to such persons as directed by the Contract Administrator, and shall instruct County personnel in the operation, adjustment, and maintenance of all equipment and systems.

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ARTICLE 25.

ACCEPTANCE AND FINAL PAYMENT; ADMINISTRATION OF THE WITHHOLD ACCOUNT.

Section 25.01. CONTRACTOR'S REQUEST FOR FINAL PAYMENTS AND CHANGE ORDERS.

When the Work is fully (100%) complete and all items on the punch list have been satisfied, or the Contractor contends that such items are not required by the Contract Documents, the Contractor shall submit Requests for Final Progress Payment and Final Payment.

The request for Final Progress Payment shall include the total amount the Contractor contends is due on the Contract Price less the amounts to be withheld for Final Payment. The amounts to be withheld for Final Payment shall include no less than One-Hundred Twenty-Five Percent (125%) of the total of all claims identified by the Contractor in the accounting submitted pursuant to Section 24.03-A, plus One-Hundred-Twenty-Five Percent (125%) of all unpaid claims against the Project by the County or any other claimant, which claims authorize a County withhold and/or retention pursuant to the Contract Documents, State or Federal law.

With the requests for Final Progress Payment, the Contractor shall submit its request for a final Contract Price Change Order with all information required by Article 17, and/or Contract Time Change Order, with all information required by Article 3, if the Contractor requests an adjustment in the Contract Price and/or Contract Time then in effect.

Section 25.02. CONTRACTOR ADMINISTRATOR'S ESTIMATE.

Upon receipt of all required submittals and the Contractor's Requests for Final Payments, the Contract Administrator shall conduct a final inspection to identify any deviations from the Contract Documents in the Work, and estimate the cost of corrections of such deviations.

After Final Inspection, the Contract Administrator shall prepare an estimate of the final sum due the Contractor. Said estimate shall take into account the Contract Price, as adjusted by any Change Orders; amounts previously paid; the Final Progress Payment; and sums to be withheld and/or retained for claims against the Project for incomplete work, liquidated damages, and for any other cause under the Contract. The Contract Administrator shall deliver a copy of this transmittal to the Contractor.

The Contract Administrator's estimate shall address whether the completion date for purposes of calculating liquidated damages should relate back to the date of the Contractor's Request for Final Payment, pursuant to Section 3.06.

Section 25.03. PROTEST TO PROCUREMENT MANAGER

If the Contractor contests the estimate of sums due prepared by the Contract Administrator, the Contractor shall, within five (5) days following delivery of the Contract Administrators' final inspection report, file his protest in writing with the Procurement Manager, setting forth in detail all grounds alleged to justify adjustment to the Contract Administrator's final estimate. Failure to file such protest shall constitute a waiver of the right to contest or otherwise challenge the Contract Administrator's final inspection report and estimate, and acceptance of the rest by Contractor.

Section 25.04. RESOLUTION AUTHORIZING ACCEPTANCE OF CONTRACT AND RECORDATION OF NOTICE OF COMPLETION.

Acceptance of the Work by the Board of Supervisors and the recordation of a Notice of Completion shall be in the manner prescribed by law, provided that the County is of the opinion that the Work is fully and satisfactorily completed and the provisions of the Contract Documents fully and satisfactorily performed in all respects. The acceptance of the Work by the County will only be made by resolution of the Board of Supervisors in a regular session. The Notice of Completion shall specify the date of the Resolution of Acceptance as the completion date and shall be recorded in the manner provided by law.

The County reserves all rights provided by law and/or the Contract Documents if the Work is not fully satisfactory and complete in all respects.

The resolution shall specify the final Contract Price and Time, with deductions and/or offsets for liquidated damages, the cost of correction of defective work or workmanship, inadequate clean-up, non-compliance with the Contract Documents, or statutory fines, forfeitures or penalties.

Section 25.05. DETERMINATION OF FINAL PROGRESS PAYMENT AND WITHHOLD AMOUNT.

After the Board of Supervisors has approved a Final Contract Price and Time, the Contract Administrator shall adjust the withhold Amount, as follows:

A. At no time shall the withhold amount be less than five (5%) percent of the Final Contract Price, or One-Hundred-twenty-Five (125%) percent of the total of all claims against the Project from all sources, including the County, whichever is the greater amount.

B. The Contract Administrator is authorized to withhold additional sums necessary to protect the County in his sole discretion, if claims, including State or Federal prevailing wage claims, and/or stop notices are filed, or to secure the County's own claims.

C. The Contract Administrator is authorized to process payment(s) to the Contractor at such frequency as the Contract Administrator shall determine, when the Contractor has provided acceptable submittals with its request(s) for release of withheld amounts, as specified in Section 25.06.

Section 25.06. SUBMITTALS FOR RELEASE OF WITHHELD AMOUNTS.

With its request for release of amounts withheld and/or retained by the County, the Contractor shall submit the following:

A. Receipts and releases on forms standard in the industry and approved by the County, from all first-tier subcontractors, releasing the County from all further claim or liability.

B. Receipts and releases, including Stop Notice releases if stop notices have been filed, from any persons or firms claiming against the Project; or fully executed agreements by such claimants specifying a settlement of their claims.

C. Releases and authorizations to pay from any State or Federal agency claiming against the Project, including prevailing wage claims.

D. Waiver of all claims by the Contractor against the County except those which the Contractor expressly specifies therein as being outstanding and not included in the waiver.

The maximum amount the Contractor may request to be released shall not exceed the amount specified in Section 25.05-A.

Section 25.07. ADMINISTRATION OF WITHHOLD ACCOUNT.

The County reserves all rights regarding its administration of the withhold fund, with or without filed Stop Notices, including all judicial remedies provided by law.

In its sole discretion, the County may contact such claimants, or any of them, and reach independent settlement of their claims, through use of warrants jointly payable to claimants or otherwise.

In addition, the County is authorized to retain sums as needed, in its sole discretion, to secure its own claims.

Section 25.08, PAYMENT OF WITHHELD AMOUNTS.

On the thirty-fifth (35th) calendar day following recordation of a Notice of Completion, the undisputed balance owing in the withhold account shall be due and payable to Contractor.

The "undisputed balance owing" shall be the difference between the final Contract Price fixed by the Board of Supervisors' Resolution of Acceptance less the following amounts:

A. All payments made to date;

B. One-Hundred-Twenty-Five (125%) percent of the total amounts claimed in unresolved stop notices on file with the County or wage claims and related penalties in the jurisdiction of any State or Federal wage compliance office;

C. The total of any claims by the County for defective work, and/or liquidated damages.

The balance owing shall be "due and payable" upon presentation by the Contractor of releases executed by the Contractor, releasing the County of Yolo from all claims arising by virtue of the Agreement for Construction related to the amounts released from the withhold.

Payment of undisputed contract amounts is contingent upon the Contractor furnishing the County with a release of all claims against the public entity arising by virtue of the Agreement for Construction. The Contractor shall specifically identify in the release any disputed claim, including the amount thereof, which is excluded from the release. Any claim not so specified within the release shall be forever released, discharged, and waived. If the Contractor disputes the amount owing by the County, the final balance in the Withhold Account shall become due and payable only upon execution by the Contractor and the County of an accord and satisfaction agreement acceptable to both, by which both release the other from all claims.

If the Contractor accepts the final balance in the Withhold Account as the total due and payable by the County, and provides a written final release, the accord and satisfaction agreement shall not be required.

Nothing in this Article shall be construed as requiring the Contractor to waive any claim against the County in violation of Public Contracts Code Section 7100, nor as constituting a waiver by the County of any claim or legal right against the Contractor.

Section 25.09. NON-WAIVER.

Neither acceptance of nor payment for the Work or any part thereof, nor any extension of time, nor any possession taken by the County shall operate as a waiver of any of the provisions of the Agreement for Construction, nor shall a waiver of any breach of this Agreement be held to be a waiver of any other or subsequent breach. In addition, adoption of a Resolution of Acceptance and recordation of a Notice of Completion shall not be deemed an acceptance of latent defects, shall not constitute a waiver of any of the provisions of the Agreement, and shall not relive the Contractor of its obligation to complete the work as specified in the Contract Documents and in compliance with all applicable laws and regulations.

Section 25.10. WORK AFTER NOTICE OF COMPLETION.

Contractor shall do no work after recordation of a Notice of Completion, save only work required by the warranties and guarantees provided under the Agreement for Construction.

Any work done after recordation of a Notice of Completion shall be conclusively presumed to be in furtherance of the Contractor's obligations on such warranties and guarantees for all purposes.

Section 25.11. STOP NOTICES; WHERE TO FILE; ENFORCEMENT.

All persons are advised hereby that all Preliminary Notices and Stop Notices shall be filed at the following address:

County of Yolo
Director of General Services
Yolo County General Services Department 120 West Main Street, Suite C
Woodland, CA 95695

The envelopes and the Notice shall clearly designate the name of the Project.

The Contractor shall cause the provisions of this Section to be inserted in all subcontracts and material contracts executed by the Contractor and notice of this provision shall be given to all persons furnishing materials for the Work.

All Stop Notice claimants are referred to Civil Code Section 3103 for the required contents of a Stop Notice, and Sections 3179 and following regarding enforcement/release of Stop Notice.

ARTICLE 26.

GUARANTEES AND WARRANTIES.

Section 26.01. GUARANTEE REQUIRED.

In addition to any guarantees required elsewhere by the Contract Documents, the Contractor shall guarantee the Work for a period of one (1) year from and after the recordation of the Notice of Completion, Notice of Cessation or, if neither is recorded, upon actual cessation of the Work. Such guarantee shall be made on the form provided, as set forth in Section 26.02 below.

Such guarantee is in addition to, and not in lieu of, the County's rights to enforce the Agreement for Construction in all respects, and the County's rights on all other guarantees and warranties required by the Technical Specifications.

Section 26.02. FORM OF GUARANTEE.

The guarantee required by this Article shall provide as follows:

The (Contractor) hereby unconditionally guarantees that the Work performed pursuant to the (Name of Project) Agreement for Construction (Yolo County Agreement No.) has been fully performed and completed in accordance with the requirements of the Agreement for Construction therefore and in compliance with all applicable laws and regulations, and further guarantees the Work of the Contract to be and remain free of defects in workmanship and materials for a period of one (1) year from the date of recordation of a Notice of Completion, Notice of Cessation, or actual cessation of work, whichever is longer. The Contractor hereby agrees to repair or replace any and all the Work, together with any adjacent Work which may have been damaged or displaced in so doing, that is not in accordance with the requirements of the Agreement and applicable laws and regulations, or that may be defective in its workmanship or material within the guarantee period specified, without any expense whatsoever to the County of Yolo, ordinary wear and tear excepted. The Contractor has provided contract bonds that will remain in full force and effect during the guarantee period.

The Contractor further agrees that within ten (10) calendar days after being notified in writing by the County of Yolo of any Work not in accordance with the foregoing requirements he will commence and prosecute with due diligence all Work necessary to fulfill the terms of this guarantee, and to complete the Work within a reasonable period of time. In the event he fails to so comply, he does hereby authorize the County of Yolo to proceed to have such Work done at the Contractor's expense and he will pay the cost thereof upon demand. The County shall be entitled to all costs, including reasonable attorney fees, necessarily incurred upon the Contractor's refusal to pay the above costs.

Notwithstanding the foregoing paragraph, in the event of an emergency constituting an immediate hazard to the health or safety of the employees or property of the County of Yolo, the County may undertake, at the Contractor's expense and without prior notice, all Work necessary to correct such hazardous condition when it was caused by the Work and/or the Contractor’s not being in accordance with the foregoing requirements, and to charge the same to the Contractor as specified in the preceding paragraph.

This guarantee set forth herein is not intended by the parties, nor shall it be construed, as in any way limiting or reducing the County of Yolo's rights to enforce all terms of the Agreement for Construction referenced hereinabove or the time for enforcement hereof. This guarantee is provided in addition to, and not in lieu of, the County's rights on such Agreement.

This Agreement is in addition to, and not in lieu of, the County's rights on all other guarantees and warrants required by the Contract Documents.

CONTRACTOR' SIGNATURE

(CORPORATE SEAL)

Section 26.03. GUARANTEE CONTRACT BOND.

Prior to Final Payment, the Contractor shall post a surety securing performance of his guarantee, as required by section 2.04 hereof.

Section 26.04. OTHER GUARANTEES.

All other guarantees or warranties required by the Contract Documents shall be subject to approval as to form by the County. At a minimum, such guarantees or warranties shall provide that the guarantor/warrantor shall repair or replace defective materials and/or workmanship, along with adjacent work that may be damaged or displaced in so doing and shall be unconditional. Such guarantees are in addition to, and not in lieu of, the product manufacturers' warranties, expressed or implied, and the Contractor's guarantee required by this Article.

Section 26.05. GUARANTEES NOT WAIVER.

By accepting the guarantees required by the Contract Documents, the County shall not be deemed to have waived any warranty or buyer protection implied, required and/or provided by the law of the State of California, nor to have altered any applicable statute of limitations regarding enforcement of any right of the County created by the Agreement for construction or otherwise. These guarantees and warranties are in addition to, and not in lieu of, such rights.

No disclaimer or limitation of any such right shall be valid unless properly executed by the County.

ARTICLE 27.

COUNTY'S RIGHT TO TERMINATE AGREEMENT.

Section 27.01. GROUNDS FOR TERMINATION.

The County may terminate the Agreement for Construction, pursuant to the provisions of this Article, for the following causes:

A. The Contractor has been adjudged bankrupt or has made a general assignment for the benefit of creditors, or that a receiver has been appointed on account of the insolvency of the Contractor.

B. The Contractor or any of his subcontractors violates any of the provisions of the Contract Documents or fails to perform the Work within the Contract Time specified in the Progress Schedule then in effect and approved by the County;

C. The Contractor or any of his subcontractors fails to make prompt payment to subcontractor or material men for material or for labor.

D. The Contractor or a subcontractor persistently disregards laws, ordinances, or the instructions of the County.

E. The Contractor fails to provide and keep in full force and affect all required insurance, and to cause all subcontractors to so comply.

F. Neglect of the work amounting to material breach of the Agreement for Construction.

G. Any other material breach by the Contractor.

Section 27.02. PROCEDURE FOR TERMINATION.

Upon the certification of the Contract Administrator that sufficient cause exists to justify the termination of the Agreement for the Construction, the County Administrator may, without prejudice to any other right or remedy of the County, give written notice to Contractor and his surety or sureties of its intention to terminate the Agreement.

Unless within seven (7) days of the giving of such notice, the Contractor shall cease such violation and make satisfactory arrangements for a correction thereof, the Agreement shall, upon the expiration of the said seven (7) days, cease and terminate.

In the event of any such termination, the County shall immediately give written notice thereof to the surety and to the Contractor and the surety shall have the right to take over and perform the Contract; provided, however, that if the surety within fourteen (14) days after service of the notice of termination, does not commence performance of the Contract, the County may take over the Work and prosecute the same to completion by contract or by any other method it may deem available, for the account and at the expense of the Contractor, and the Contractor and his sureties shall be liable to the County for any costs occasioned by the County thereby. In such event, the County may, without liability, take possession of and utilize in

completing the Work, such materials as may be on the Site of the Work and necessary, therefore. In any such case, the Contractor shall not be entitled to receive any further payment until the work is finished.

Section 27.03. RECONSTRUCTION IN EVENT OF LOSS.

In the event of a partial or total destruction of any or all of the work or materials to be provided pursuant to this Agreement, at any time prior to the final completion of the Project and the final acceptance of the Work by the County, the Contractor promptly shall reconstruct, repair, replace or restore, all work or materials so destroyed at no cost to the County.

Nothing herein provided shall in any way excuse the Contractor from the obligation of furnishing all the required materials and competing the Work in full compliance with the terms of the Contract Documents; provided that a reasonable time extension shall be negotiated by the parties.

This section shall not apply if the destruction is by an "Act of God" as defined in Public Contract Code Section 7105 and the loss is in excess of five percent (5%) of the total Contract price.

Section 27.04. OPTION IN EVENT OF A LOSS.

In the event that any destruction or loss should exceed twenty percent (20%) of the value of the construction completed to date, as determined at the end of the preceding month, or is due to an "Act of God" as defined above, the County shall have the option at its sole discretion to terminate this Contract.

Section 27.05. PROVISION FOR TERMINATION OF CONTRACT.

This Contract is subject to termination as provided by Section 4410 and 4411 of the Government Code, being portions of the Emergency Termination of Public Contracts Act of 1949.

ARTICLE 28.

ADDITIONAL PROVISIONS.

Section 28.01. CONFLICT OF INTEREST.

No official of the County who is authorized on behalf of the County to negotiate, make, accept, or approve, any architectural, engineering, inspection, construction, or materials supply contract, or any subcontract in connection with the construction of the Project, or any land acquisition in connection with the Project, shall become directly or indirectly interested personally in the Agreement for Construction or in any part thereof.

No officer, employee, architect, construction manager, attorney, engineer or inspector of or for the County who is authorized on behalf of the County to exercise any executive, supervisory, or other similar function in connection with the construction of the Project shall become directly or indirectly interested personally in the Agreement for Construction or any party thereof.

Section 28.02. NOTICES.

Any notice from one party to the other pursuant to the Contract Documents shall be in writing and shall be dated and signed by the party giving such notice or by a duly authorized representative of such party. Any such notice shall not be effective for any purpose whatsoever unless served in the following manners: If the notice is given to the Contract Administrator, it must be served personally at his office or by depositing same in the United States Mails, in a sealed envelope, correct postage prepaid, and correctly addressed to the address shown the Instructions to Bidders.

If the notice is given to the Contractor, it must be by personal delivery thereof to Contractor or to Contractor's Project superintendent at the Site of the Work, or by depositing the same in the United States Mails, in a sealed envelope, addressed to the Contractor at the place designated in the Bid by the Contractor for the receipt of correspondence.

If the notice is given to a surety of the Contractor, it must be by personal delivery to such surety or by depositing the same in the United States Mails, in a sealed envelope, addressed to such surety or other person at the address last communicated by him to the County. Copies of all such notices shall be delivered to the Contractor.

Section 28.03. NO VERBAL AGREEMENTS.

No verbal agreement or conversation with any officer, agent, or employee of the County, either before, during, or after the execution of the Contract Documents shall affect or modify any term or condition contained in the Contract Documents, nor shall such verbal agreement or conversation entitle the Contractor to any additional payment or time to perform whatsoever under the terms of the Agreement for Construction.

Section 28.04. EXAMINATION OF PROPOSED PROJECT LOCATION AND CONTRACT DOCUMENTS.

By submitting its Bid and executing the Agreement for Construction, the Contractor warrants that prior to bidding it carefully examined the location of the Project, that it carefully reviewed the Contract

Documents, and that it is fully aware of all the Work called for by the Contract Documents, the nature of the Site, and the requirements of all Specification including these General Conditions. The Contractor also warrants that it is familiar with all relevant circumstances and conditions affecting construction projects in Yolo County, California, and the particular site, and has the requisite experience and skill to perform the Agreement for Construction on the Site of the Project.

Section 28.O5. NOTICE OF POTENTIAL CLAIMS.

A. The Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act or failure to act, by the County or any of its officers, agents, or employees, or the happening of any event, thing or occurrence, unless he shall have given the County written notice of potential claims as specified herein.

The written notice of potential claims shall set forth the reasons for which the Contractor believes additional compensation should be paid, a firm estimate or accounting of the cost involved, and, insofar as possible, the total amount of the claim.

Such notice must have been given to the County prior to the time that the Contractor shall have performed the work giving rise to the potential claim if based on an act or failure to act by the County, or in all other cases within five (5) days after the happening of the event, thing, or occurrence giving rise to the potential claim or such other time as may be specified herein.

It is the intention of this Section that differences between the parties arising as a result of performance of the Contract shall be brought to the attention of the County at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence, for which no written notice of potential claim was filed as required by this section.

This subsection shall not supersede, but shall be superseded by, any provisions of these Contract Documents that specifically set forth the procedure for the Contractor to give notices of claims to the County in any particular case.

B. Any lawsuit, action or other proceeding seeking damages, costs, compensation or any other recovery, based upon any claim related to the Project, including but not limited to claims of the Contractor, subcontractors, suppliers, laborers and workers, must be preceded by a claim filed in accordance with Government Code Sections 900 et seq.

Section 28.06. CONTINUING WORK IN DISPUTE.

The Contractor shall not delay or suspend performance of the work pending resolution of any dispute or controversy between the County and the Contractor or any other person, firm, or entity involved in the Work.

If these General Conditions specify a procedure to resolve the particular issue, it shall be followed. If no specific procedure is specified, the Contractor shall give notice of the dispute as provided in Section 28.05.

The County's resolution of the issue shall be followed by all parties for the remainder of the Work. If notice has been filed pursuant to Section 28.05, the Contractor is authorized and shall request a Final Change Order to satisfy the unresolved Contract Price or Time claims arising from the issue, pursuant to Section 25.01.

Section 28.07 ASSIGNMENT OF CERTAIN CLAIMS

In entering into this contract, or any subcontract to supply goods, services, or materials pursuant to this contract, the Contractor and any subcontractor offers and agrees to assign to the County all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the contract or the subcontract. This assignment shall be made and become effective at the time the County tenders final payment to the Contractor, without further acknowledgment by the parties.

Section 28.08 NO THIRD-PARTY BENEFICIARIES

Except where specifically stated otherwise in the Agreement for construction, the promises in the Agreement benefit the COUNTY and CONTRACTOR only. They are not intended to, nor shall they be interpreted or applied to, give any enforcement rights to any other persons (including corporate) that might be affected by the performance or non-performance of this agreement, nor do the parties hereto intend to convey to anyone else any "legitimate claim of entitlement" with the meaning and rights that phrase has been given by case law.

END OF GENERAL CONDITIONS

SECTION 00 12 00

NOTICE TO BIDDERS

NOTICE IS HEREBY GIVEN that the County of Yolo will receive sealed bids in accordance with the provisions of the Public Contract Code from contractors licensed for the furnishing of all labor, materials, equipment, transportation, mobilization, demobilization, permitting, disposal and any other required services for the performance of the following Work:

Yolo County Ag Department Shops Building

The extent of work is identified in the Technical Specifications Volume II.

All work to be performed during the hours of 7:30am-5:00pm, Monday through Friday.

Plans and Specifications for the work will be available as noted herein.

All questions regarding Plans and Specifications and Interpretations or Clarifications for this Initiation for Bid must be entered electronically through Periscope (formerly Bid Sync at (https://www.BidSync.com). The County's Project Manager will respond to all Contractor questions through the Periscope (formerly Bid Sync) Question and Answer section on this website.

SEALED BIDS:

Sealed bids on the above project shall be filed with Yolo County General Services Department, Procurement Division, located at 120 West Main Street, Suite C., Woodland, CA 95695, before **2:00 pm** on **Thursday, October 24, 2024.**

All bids must be marked clearly on the envelope:

"Yolo County Ag Department Shops Building"

Said bids will be opened in public after **2:15 pm** of said day at Yolo County General Services Department -Procurement Division 120 West Main Street, Ste. C, Woodland, CA 95695. Bids shall be submitted only on forms provided in the Bid Documents and shall be accompanied by all documents and information required to be submitted by the Instructions to Bidders and by law. No bid may be withdrawn after the time established for receiving bids or before the award and execution of the Contract, unless the award is delayed for a period exceeding one hundred twenty (120) calendar days. The low bidder, for purposes of the award, shall be the responsive bidder offering the low lump sum amount for the base bid and meeting all other bid submittal requirements. The County reserves the right to reject any or all bids.

CONTRACTOR'S LICENSE REQUIRED:

The Board will not consider or accept any bids from contractors who are not licensed to do business in the State of California. Contractor warrants and represents that he/she holds a valid California license pursuant to the State Contractors License Act [Business and Professions Code Section 7000, et seq.], that his/her license is in good standing and that he/she possess a Class A or Class B; C-10, C-12, C-27 and C-36 license and any other additional licensing needed to perform all required categories and type of work -- or any others as identified per design plan. Copies of the Contractor's State Contractor license(s) must be provided, along with their bid.

REQUIRED LISTING OF PROPOSED SUBCONTRACTORS:

Each proposal shall have listed therein the name and address of each subcontractor to whom the Bidder proposes to subcontract portions of the Work in an amount in excess of one-half of one percent (½ of 1%) of his total Bid in accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100, through 4113 inclusive of the Public Contract Code. The Bidder's attention is invited to other provisions of said Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions.

Notice is hereby given that the Project is a public works project within the requirements of Division 2, Part 7, Chapter 1 of the California Labor Code, and that each bidder and listed subcontractor is required to be registered pursuant to Labor Code section 1725.5 at the time of bidding. Failure of the bidder to be registered at the time of bidding shall render the bid non-responsive and unavailable for award. Bidder's listing of an unregistered subcontractor may render the bid non-responsive and unavailable for award unless such failure is the result of an inadvertent error and the provisions of Labor Code section 1771.1 apply.

JOINT APPRENTICESHIP COMMITTEE PARTICIPATION REQUIREMENT

The County has adopted additional requirements for certain "Covered Projects" as defined in the County's Policy on Procurement. This Project is considered a "Covered Project" and is subject to the County's Joint Apprenticeship Committee (JAC) participation requirement. The County has adopted a JAC participation requirement for certain public projects estimated to cost more than one-million dollars ($1,000,000). A JAC means an apprenticeship program comprised of an equal number of employer and employee representatives approved by the State of California Division of Apprenticeship Standards. This JAC requirement is in addition to the apprenticeship requirements of the Prevailing Wage Laws.

To satisfy the County's JAC participation requirement, Contractors must submit with their bid the Joint Apprenticeship Committee Participation Certification with signed evidence satisfactory to the Procurement Manager or the Procurement Manager's designee that they participate in a JAC by being a signatory to a JAC or employ registered apprentices dispatched by a JAC. Such evidence may be in the form of a signed letter from a JAC confirming the Contractor is a signatory to a JAC or has hired registered apprentices who are active participants of a JAC.

In addition, Bidders must submit a signed "Statement Re: No Apprenticeship Violation" confirming the Bidder has not been found in violation of any provision of state or local apprenticeship laws or regulations in the past three years.

HEALTH CARE EXPENDITURE REQUIREMENT

The County has also adopted the following health care expenditure requirement for certain public projects estimated to cost more than one-million dollars ($1,000,000):

Each Contractor with construction craft employees shall make health care expenditures for each such employee in an amount per hour worked on the Covered Project equivalent to at least the hourly pro rata cost of a Covered California Platinum level plan for two 40-year-old adults and two dependents 0 to 14 years of age for the Covered California rating area in which the development is located. Qualifying expenditures shall be credited toward compliance with prevailing wage payment requirements up to the amount determined by the Director of Industrial Relations pursuant to Sections 1773 and 1773.9 of the Labor Code. Health care expenditures in excess of that amount shall not be so credited. "Health care expenditures" include contributions under Sections 501(c) or (d) or 401(a) of the Internal Revenue Code and payments toward "medical care" as defined under Section 213(d)(1) of the Internal Revenue Code. A Contractor that is signatory to a valid collective bargaining agreement that requires payment of at least the prevailing wage, participation in a joint labor-management apprenticeship program, and the provision of health care payments for all construction craft employees shall be deemed in compliance. A Contractor without construction craft employees shall show a contractual obligation that its subcontractors comply with this paragraph.

Bidders must submit a signed Acknowledgment confirming they have read and will comply with this requirement.

CALIFORNIA AIR RESOURCES BOARD REQUIREMENT

The California Air Resources Board ("CARB") implemented amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulations ("Regulation") which are effective on January 1, 2024 and apply broadly to all self-propelled off road diesel vehicles 25 horsepower or greater and other forms of equipment used in California. A copy of the Regulation is available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/off-roaddiesel/appa-1.pdf. Bidders are required to comply with all CARB and Regulation requirements, including, without limitation, all applicable sections of the Regulation, as codified in Title 13 of the California Code of Regulations section 2449 et seq. throughout the duration of the Project. Bidders must provide, with their Bid, copies of Bidder's and all listed subcontractors' most recent, valid Certificate of Reported Compliance ("CRC") issued by CARB. Failure to provide valid CRCs as required herein may render the Bid non-responsive.

The County is a Public Works Awarding Body, as defined under Title 13 California Code of Regulations section 2449(c)(46). Accordingly, Bidders must submit, with their Bids, valid Certificates of Reported Compliance ("CRC") for the Bidder's fleet and for the fleet(s) of its listed subcontractors (including any applicable leased equipment or vehicles). Bidders must additionally complete and submit the Fleet Compliance Certification, included in the Bid Documents. Failure to provide a CRC for the Bidder, and for all listed subcontractors, or failure to complete the Fleet Compliance Certification, may render the Bid non-responsive.

BID EXAMINATION AND PREPARATION:

Project Documents may be obtained at Periscope (formerly Bid Sync) at (https://www.BidSync.com) or at the Yolo County Website (under *Doing Business with the County*). Documents will be available beginning on January xx, 2024. It is the bidder's responsibility to arrange for printing services to obtain printed copies of the bid documents. The contract documents may also be examined at the following locations:

Construction Bid Board
Dodge Data & Analytics
Sacramento Regional Builders Exchange
Placer County Contractors Association & Builders

The Bidder shall carefully examine the Bid Documents, including the Plans and Specifications and the Asbestos Inspection Report, and satisfy the Bidder as to their sufficiency, and shall not at any time after submission of the Bid, dispute or complain of such Plans or Specifications nor assert that there is any misunderstanding in regard to the location, extent or nature or amount of work to be performed in accordance thereto. Should a Bidder find discrepancies or omissions in the Plans and Specifications, the Bidder shall notify the Project Manager immediately. Interpretations or clarifications considered necessary by the Project Manager shall be by addenda, mailed or electronically delivered to all plan holders and acknowledged on Bid form. Questions received after **2:00 p.m. of October 10, 2024** will not be answered. The issuance and release of the final addendum is estimated to be **Thursday , October 17, 2024.**

The Bid shall have all items filled in and the signatures of all persons signing the Bid shall be in long-hand. Mistakes must be corrected, and the correction inserted and initialed in ink by the person signing the Bid. Erasures and/or correction fluid are NOT acceptable. Changes must be lined out and corrections inserted adjacent and initialed by the bidder's authorized representative. No proposal will be considered which makes exceptions, changes or reservations to the Plans and Specifications.

The bids must supply all information required by the bid documents & specifications. Bids must be full and complete. The County reserves the right in its sole discretion to reject any bid as non-responsive as a result of any omission or error in the bid.

SUBSTITUTIONS:

Bids shall be based on products and systems specified in the Bid Documents or listed by name in addenda. Contractors and materials suppliers may submit requests for substitutions up to 35 days following Notice of Award.

NON-COLLUSION DECLARATION:

Bidders shall include with their bids a signed declaration under penalty of perjury stating that their bid is not a sham or a collusive bid. The declaration is to be signed exactly as worded; no alternate wording will be accepted. The declaration is included with the bid.

DEBARMENT AND SUSPENSION

By signing and submitting a bid for the Project, Bidder represents and warrants that it is eligible to bid and work on this project pursuant to Sections 1777.1 and 1777.7 of the California Labor Code and other applicable provisions of law. Further, Bidder acknowledges that it is prohibited from performing work on this project with a subcontractor who is ineligible to perform work on public works project pursuant to Sections 1777.1 and 1777.7.

ECONOMIC SANCTIONS

Pursuant to California State Executive Order N-6-22 ("Executive Order") imposing economic sanctions against Russia and declaring support of Ukraine, County shall terminate any contract with any individual or entity that is in violation of the Executive Order or that is subject to economic sanctions therein and shall not enter a contract with any such individual or entity while the Executive Order is in effect. By signing and submitting a bid, Bidder acknowledges and represents that it is aware of and shall comply with the Executive Order and that Bidder is not a target of economic sanctions pursuant to the Executive Order or the federal government, nor is Bidder conducting prohibited transactions with sanctioned individuals or entities. Violation of the Executive Order shall be grounds for County to terminate the Construction Agreement.

BONDS AND INSURANCE REQUIRED:

A bid security shall be provided with each Bid. Bid security shall be in an amount of not less than ten percent (10%) of the total amount of the Bid and shall be cash, a certified check or cashier's check drawn to the order of the County of Yolo or a Bidder's Bond executed by a surety satisfactory to the County of Yolo in the form provided in the Proposal section of these Bid Documents. The Bidder to whom award is made shall provide Certificates of Insurance as required in Article 2 of the General Conditions, and shall complete and submit the Performance Bond and Payment Bond forms contained in the Contract Documents.

PREVAILING WAGE PROVISION:

a. Pursuant to Labor Code Section 1770 et seq., 1773, 1773.1, 1773.2, 1773.6, 1773.7, and 1720 each laborer or mechanic of contractor or any subcontractor engaged in work on the project under this Contract shall be paid not less than the hourly wage rate of per diem wages set forth in the prevailing wage rate schedule published by the Director of Industrial Relations regardless of any contractual relationship which may be alleged to exist between contractor or any subcontractor and such laborers and mechanics. Interested parties may obtain the current wage information by submitting their requests to the Department of Industrial Relations, Division of Labor Statistics and Research, P.O. Box 603, San Francisco, CA 94101, or at www.dir.ca.gov/dlsr/pwd.

b. Any laborer or mechanic employed to perform work on the project under this Contract, which work is not covered by any of the foregoing classifications, shall be paid not less than the prevailing rate of per diem wages specified herein for the classification which most nearly corresponds to the work to be performed by him/her.

c. The foregoing specified prevailing wage rates are minimum rates only, and the contractor may pay any wage rate in excess of the applicable rates contained in this Contract.

d. Pursuant to Labor Code Section 1775, the contractor as a penalty to the owner shall forfeit $200.00 for each calendar day, or portion thereof for each worker paid less than the prevailing rate established by the Department of Industrial Relations for such work or craft in which such worker is employed. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which the worker was paid less than the prevailing wage rate shall be paid to each worker by the contractor. NOTE: an error on the part of an awarding body does not relieve the contractor from responsibility for payment of the prevailing rate of per diem wages and penalties pursuant to Labor Code Sections 1770-1775.

e. Prevailing wage rates are available through the following website: https://www.dir.ca.gov/OPRL/dprewagedetermination.htm.

f. All contractors and subcontractors are subject to the provisions of Sections 1810 through 1814 of the California Labor Code which provide for the maximum hours a worker is to be employed and the amount and rate of overtime compensation.

AWARD OF CONTRACT:

Bids will be considered for award by the Yolo County General Services Department. The County of Yolo reserves the right after opening bids to reject any or all bids, or to waive any informality (non-responsiveness) in any bid, or to make award to the lowest responsive, responsible bidder and reject all other bids, as it may best serve the interests of the County.

If this Contract is to be awarded, the Notice of Award shall be issued to the lowest responsible, responsive bidder within One-Hundred Twenty (120) days following the bid opening.

As a condition of award, the successful Bidder will be required to submit bonds and evidence of insurance prior to execution of the Agreement by the County. Failure to meet this requirement shall constitute abandonment of the Bid by the Bidder and forfeiture of the Bid Bond. Award will then be considered to the next lowest responsible Bidder.

All bids will be compared using the Opinion of Probable Cost prepared by the AE of Record for the project. For the purposes of bonding, the OPC for the base bid work is in the range of $3,081,724.00.

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PRE-BID CONFERENCE:

A mandatory pre-bid conference is scheduled for **2:00pm** on **October 3, 2024,** at the project site located at 120 West Main Street, Woodland, CA right outside of Ste. C. The County shall allow a ten-minute grace period for tardiness to the job walk. Any questions that can be answered at that time by direct reference to the Contract, Plans and Specifications, will try to be answered. Questions that cannot be so answered will be addressed, as necessary, by written addendum. Submission of a bid shall be considered an acknowledgment of familiarity with the Contract, Plans and Specifications, and conditions at the site. Oral statements made during the bidding period may not be relied upon and will not be binding or legally effective.

PROJECT MANAGER:

All communications relative to the Contract Documents and Plans shall be posted on Periscope (formerly BidSync). No oral responses to any questions concerning the content of the Plans and Contract Documents will be given. Responses, if any, will be in the form of written addenda to the Contract Documents and Plans.

By order of the Yolo County General Services Department, County of Yolo, State of California.

By:

Chris Rice
County of Yolo
Project Manager

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SECTION 00 55 00

NOTICE TO PROCEED

Dated: xxxxxxxxxx, 2024

TO: xxxxxxxxxxxxxx (Contractor)

ADDRESS: xxxxxxxxxxxxx
xxxxxxxxxxxxx

RE: COUNTY OF YOLO

PROJECT:

Yolo County Ag Department Shops Building

BID NO. 01

CONTRACT FOR

You are notified that the Contract Time under the above contract will commence to run on xxxxxxxxxxxxxxxxxxxx, 2024. By that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 3 of the Construction Agreement (Document 00 52 00), the date of final completion 548 calendar days from the date of this notice.

THE COUNTY OF YOLO

By:_____

Chris Rice

Project Manager
Yolo County General Services Department

October 11, 2024

Chris Rice
Capital Projects Division Manager
Yolo County General Services Department
120 W. Main St., Suite G
Woodland, CA 95695

Re: ADDENDUM #3
Yolo County Ad Department Shops Building
County Job No. WA20-106-3719-AG
120 W. Main St.,
Woodland, CA 95695
CJA Project #21027

The following additions were made to the project manual technical specifications sections based on question 17 below.

Question 17

Please provide the specifications for IT cabling. I cannot find them in the plans.

Response 1:

Specification section 27 10 00 Structured Cabling System and supplemental diagrams were left out of the project manual. See attached documents.

END

Prepared by
COMSTOCK JOHNSON ARCHITECTS, INC.

David Helms, AIA
Architect C-28687

Principals:

Daniel P. Eriksson
Architect

Kevin L. Wilcox
Architect

10520 Armstrong Avenue · Mather, CA 95655 · Phone 916.362.6303 · Fax 916.362.5841

SECTION 27 10 00

STRUCTURED CABLING SYSTEM

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. The extent of telephone/data system, Structured Cabling System (SCS) work is indicated and is hereby defined to include, but not be limited to cable, cable supports, raceway, connectors, racks, cabinets, panels, wire management, device plates, patch cords, backboard, grounding, firestop and miscellaneous items required for a complete, tested and operational system.

B. Provide, install and test the complete cable and outlet system as indicated and described herein. Work includes procurement, project management, installation, labeling, termination, testing and cleanup of all cables installed under this project.

C. Provide system testing, as-builts (redlines) of installed cables and numbering plan, Operations & Maintenance Manuals (O&M's), and processing of warranty registration with Manufacturer.

D. Project coordination with General Contractor, Owner, Owners Representative, and other trades before, during and upon completion of project as necessary for a well-executed project.

E. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.

F. Horizontal copper cabling system consists of four twisted pairs of solid annealed copper. Each four-pair cable is terminated onto 8 position 8 conductor ("RJ45", or 8P8C) outlet connectors ("Jacks") using Insulation Displacement Conductors (IDCs). Color-coded connectors are placed into NEMA rated faceplates at the work area and placed into corresponding rack-mounted patch panels in the equipment / networking rooms. The jacks use state-of-the-art techniques to effectively eliminate Alien Crosstalk.

G. Bridged taps and/or splices will not be installed in the horizontal cabling.

H. Communications cables shall be rated CMR (riser) or CMP (plenum). CMP cable ratings are required for cables passing through or contained within plenum air handling spaces, such as above drop ceilings and return or supply air shafts. The contractor is responsible for installing the correct cable type in the appropriate environment, and any failures to do so according to the Owner or the Authority Having Jurisdiction (AHJ) will result in the contractor removing the unsuitable cable and installing the correct cable, at their own expense.

I. The maximum allowable horizontal cable length installed in the permanent link (jack to jack) is 295 feet (90 m). This maximum allowable length does not include an allowance for patch cords, maximum length of 16 feet (5 m) to the workstation equipment and of 16 feet (5 m) in the horizontal cross-connect.

1.02 DIVISION OF RESPONSIBILITY

A. Owner:
   1. All Local Area Network (LAN) hub equipment
   2. All active electronics required at the telecom room.
   3. Server Room Cabinets

B. Contractor:
   1. As indicated on plans and specifications.
   2. Testing

1.03 SUBMITTALS AND SUBSTITUTIONS

A. ACCEPTABLE MANUFACTURER SOLUTIONS:
   1. Panduit

2. General Cable
3. Owner Pre-approved equal

B. Owner has standardized on a unified, end-to-end copper and optical fiber cabling system design based on Panduit jacks, patch panels, patch cords, (Panduit / General) fiber cords, (Panduit / General) fiber connectors, trunk cables, (Panduit / General) fiber enclosures and modules, as well as General Cable field-terminable copper and (Panduit / General) fiber cables. The Owner is satisfied that the products specified herein are qualified for the purpose intended, and has performed due diligence in establishing a consistent set of standards based on performance and feature set.

C. Prior to ordering any material, provide a complete submittal, in electronic format to include copies of brochure information on all products for installation on this project. All product data and specification sheets shall be organized in the same manner as the products portion of the specifications. If more than one product is listed on the same page of the brochure or specification sheet submitted, the intended product or part number shall be clearly indicated or highlighted by the Contractor

D. Contractor shall submit along with the materials submittal all Proposed Test Procedures and a sample of the printout or test result form as well as a list of all Test Equipment to be used for cable testing. Within two (2) weeks of completion of testing all cabling systems, Contractor shall submit an electronic copy of the test results as directed in the Testing portion of the Specifications.

E. Products which are proposed in the bid response which are of an alternative solution are to be prequalified as “equal or better” by the Designer and Owner, in writing, prior to bid acceptance. If substitutions are allowed, they are at the discretion of the Owner and based on performance, suitability, quality, administrational requirements, warranty and other factors deemed important to the Owner. Written acceptance of substitutions from Owner must be included in bid package to avoid disqualification of bid.

F. Submit manufacturer’s data and installation details for all devices, plates, cable, terminal blocks, patch cords, racks, wire management, labels and similar equipment which are not in accordance with Owner standards.

G. Submit a copy of 3rd party testing and certification documents which prove they meet or exceed the requirements as set forth in this document, for any product or system not specified herein or proposed as an “equal” substitute for Owner-approved products. All products must have independent test data published prior to bid.

H. Any substitutions must be approved by Designer, Owner and/or Owner’s Representative in writing prior to acceptance of bid.

I. Company Certification: The Proposer must be certified by the manufacturer of the submitted system. If different manufacturers will be used there must be a company certification for each, and its use to be approved and authorized by County Telecommunications Staff. The Proposer must provide evidence of this certification as part of the submittal process.

1.04 REFERENCE STANDARDS

A. Strictly adhere to all Building Industry Consulting Service International (BICSI), and Telecommunications Industry Association (TIA) recommended installation, best practices, codes, and standards when installing The Structured Cabling System.

B. Material and work specified herein shall comply with the applicable requirements from the following Codes and Standards.
   1. AAAC-B – Detail Specification for 850-nm Laser-Optimized, 50-um Core Diameter/125-um Cladding Diameter Class 1a Graded-Index Multimode Optical Fibers
   2. ANSI/TIA-492.AAAD – Detail Specification for 850-nm Laser- Optimized, 50-μm Core Diameter/125-μm Cladding Diameter Class la Graded-Index Multimode Optical Fibers Suitable for Manufacturing OM4 Cabled Optical Fiber
   3. ANSI/TIA-492.CAAB – Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers with Low Water Peak. Current Edition

4. ANSI/TIA-568.0-D – Generic Communications Cabling for Customer Premises
5. ANSI/TIA-568.1-D – Commercial Building Communications Cabling Standard
6. ANSI/TIA-568-C.2-1 – Balanced Twisted-Pair Telecommunications Cabling and Components Standards
7. ANSI/TIA-568.3-D – Optical Fiber Cabling and Components Standard
8. ANSI/TIA-569-D – Telecommunications Pathways and Spaces
9. ANSI/TIA-606-B.1 – Administration Standard for the Commercial Telecommunications Infrastructure.
10. ANSI/TIA-607-C – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
11. ANSI/TIA-862-B – Structured Cabling Infrastructure Standard for Intelligent Building Systems
12. ANSI/TIA-942-A – Telecommunications Infrastructure Standard for Data Centers
13. NFPA 70 – National Electrical Code (NEC).
14. BICSI – TDMM, Building Industries Consulting Services International, Telecommunications Distribution Methods Manual (TDMM)

C Fire stopping shall be in accordance with ASTM E 814, ASTM E 136, and UL 1479 as well as Section 300-21 of the National Electric Code.

D Other applicable standards. ANSI C2-2010 National Electric Safety Code. UL 497 Electrical Grounding and Bonding Equipment.
1. IEEE 802.3 Carrier Sense Multiple Access with Collision Detection.
2. FCC Rules and Regulations, Part 68.
3. Basic, Uniform, and Standard Building Codes (BOCA, ICBO, SSBC).
4. REA Cable Designations - PE Series Specifications
5. NFPA 101 - Life Safety Code

E Conditions: Materials and equipment provided must be new products of manufacturers regularly engaged in the production of such products.

F UL Listing: Products must be UL listed where a UL test procedure is applicable.

G Communications system materials and equipment shall be FCC Type-accepted and certified as such by supplier.

1.05 ADMINISTRATION REQUIRMENTS

A. The Electrical Code referred to in these specifications is the National Electrical Code as currently adopted by the State of California. All work will be provided in strict compliance with the Electrical Code and all regulations that may apply.

B. Where standards exist, for a category, products used on this project will be listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL), and be approved or listed for the intended service and application.

C. These specifications do not undertake to repeat the requirements of codes, regulations or NRTL listing or labeling instructions. The Specifications or Drawings may require items or work beyond the requirements of applicable codes or regulations. The stricter, higher quality, greater quantity or higher cost will be allowed, and accommodations must be approved by Owner/Designer prior to procurement or installation. It is incumbent on the Installer, material and equipment suppliers to meet these specifications, applicable codes, regulations, and NRTL listing agency restrictions.

D. The word "Manufacturer" will include the Manufacturer, the Manufacturer’s Representative, the Distributor, the Fabricator, and the Supplier of the particular classification of equipment, system, product, and material.

E. All work, equipment, and systems will be manufactured, provided, repaired, installed, and tested in accordance with the latest edition and all current amendments of the applicable publications and standards of the organizations listed below as of the date of the Contract Documents.

When the Specification requirements exceed the requirements of these publications and standards the Specifications will govern:

1. State Building Code (SBC)
2. Building Department Inspectional Services
3. American Society for Testing and Materials (ASTM)
4. Underwriter's Laboratories, Inc. (UL)
5. Insulated Cable Engineers Association (ICEA)
6. National Electrical Manufacturers Association (NEMA)
7. Institute of Electrical and Electronics Engineers, Inc. (IEEE)
8. American National Standards Institute, Inc. (ANSI)
9. National Fire Protection Association (NFPA)
10. Local Electric Code
11. Department of Public Safety (DPS)
12. Building Officials and Code Administrators International, Inc. (BOCA)
13. Department of Labor USA. Safety and Health Regulations for Construction (OSHA)
14. Energy Codes
15. National Electrical Contractors Association (NECA)
16. National Bureau of Standards (NBS)
17. Federal Communications Commission (FCC)
18. Utilities Serving Project.
19. Fire Department.
20. Americans with Disabilities Act Applications Guidelines (ADAAG).
21. Accessibility Guidelines for Buildings and Facilities.
22. Any and all Federal, State and Local Standards, Codes and Authorities having Jurisdiction (AHJ).
23. Buy America Act (BAA), 41 U.S.C. § 8301-8305

F. In addition, all phases of the Structured Cabling System installation will adhere to applicable Local Area Network (LAN) Specifications of the IEEE, Electronics Industry Association/Telecommunications Industry Association (TIA/EIA), and Building Industry Consulting Service International (BICSI). The entire system and all components will be Nationally Recognized Testing Laboratory (NRTL) certified to appropriate TIA/EIA performance rating Category, Latest ANSI/TIA/EIA Standards 455-A, 492, 568, 569-A, 570, 606, 607 and 758 (latest revisions), and ANSI/TIA TSB 67, TSB 72, TSB 75, TSB 95 plus other standards as applicable.

G. The above requirements will not in any way limit responsibility or requirements to comply with all other codes, standards and laws.

H. Material, equipment, enclosures, and systems will be designed for use as required to suit the conditions, exterior or interior operation, dust tight, water tight, explosion-proof, or other special types.

I. All materials shall be purchased from Distributors authorized by system Manufacturers to sell new and unused components.

1.06 QUALIFICATIONS

A. The Structured Cabling System (SCS) required for this project shall be the following: The Contractor must have current Panduit Partner ONE Certified Installer Certificate and be qualified to offer a Panduit Certification PLUS 25-year A PanGen system performance warranty.

B. A PanGen™ System Warranty shall provide a complete system warranty to guarantee end-to-end high-performance cabling systems that meet application requirements. The guarantee shall include cable and connectivity components and have one point of contact for all cabling system issues. The system shall be warranted for a period of at least 25 years.

C. In order for the structured cabling system or additional links to be eligible for warranty coverage, an installation company trained and certified by PANDUIT ® and General Cable must install

them. The contractor shall have completed standards based product and installation training. A copy of the PCI Certificate or PanGen Installer Certificate shall be submitted in the proposal.

D. All PANDUIT ® Pan-Net ® non-consumable products have a 20-year guarantee. When installed per TIA or ISO/IEC standards, the Cabling System will operate the application(s) for which the system was designed to support.

E. In order to qualify for the guarantee, the structured cabling system must be installed per the following:
   1. Meet all TIA/EIA commercial building wiring standards.
   2. PANDUIT ® categorized product must be used in conjunction with an equivalent or higher Category UL or ETL verified cable.
   3. PANDUIT ® Products must be installed per PANDUIT ® instruction sheets.
   4. Categorized copper product shall be used in conjunction with General Cable of equivalent or higher Category cable as verified by ETL, UL or PANDUIT ® engineering

F. The company must have a minimum of three (3) years' experience in low voltage installations for voice, data, and fiber optic cabling systems.

G. The Panduit Partner ONE Certified Installer Certificate must be in place 45 days prior to bid. All personnel performing work on this project must have gone through the Panduit Partner ONE Certified Installer Certificate training program as required by Panduit prior to performance of work.

H. Warranty: All repair, including labor and material, shall be made at no cost to the owner during the warranty period. All warranties shall be provided in writing to Owner prior to acceptance of the cabling system.
   1. The contractor shall be fully conversant and capable in the cabling of low voltage applications such as, but not limited to data and voice systems. The Contractor shall at a minimum possess the following qualifications:
      Provide references of the type of installation provide in this specification.
   2. Personnel trained in the installation of pathways and support for housing horizontal and backbone cabling.
   3. Personnel knowledgeable in local, state, province and national codes, and regulations. All work shall comply with the latest revision of the codes or regulations. When conflict exists between local or national codes or regulations, the most stringent codes or regulations shall be followed.
   4. Be in the Low Voltage or Telecommunications Installation business for a minimum of three (3) years. If project is in California, contractor must possess a current California C7 or C10 license. Projects in other states must be supported by the appropriate minimum level contractor's license required for the work involved.
   5. Maintain a certified RCDD on staff and utilize manufacturer trained, or BICSI certified Installers for this project.
   6. Contractor must be less than 100 miles from project location.

I. Be an approved Member in good standing of the Certified Installer network associated with the products listed in this Specification and authorized for use in this Project. Contractor must be a member of this installer program before, during, and through completion of the system installation. Supporting documentation will be required as part of the submittal.

J. Product manufacturer and cabling solution hardware are specified for performance, applications requirements, and warranty purposes. Contractor may provide an, "or equal cabling solution" if the contractor is an authorized installer certified to provide full manufacturer warranties.

K. All structured cabling products shall be installed according to any applicable instructions.

L. All networks and other applications shall be installed per applicable standards and manufacturers' guidelines and transmitted over the appropriate minimum Category copper cable or fiber cable for which it was intended to operate on

M. All applicable local, state, national, and federal electrical and fire safety standards shall be adhered to during and after installation.

1.07 WARRANTY

A. Panduit Certification PLUS 25-year system performance warranty covering all components (cable, jacks, panels, patch cords, equipment, workmanship, etc.) shall be provided to the Owner, submitted in writing with system documentation. The warranty period shall begin on the system's first use by the owner.
   1. Horizontal channels shall be completed with Panduit/General factory-terminated copper and/or fiber optic patch cords in order to be eligible for the applicable Warranty with channel performance guarantees.
   2. Approved product shall be listed on the most recent version of the applicable Manufacturer's data sheets for each listed solution.
   3. The Contractor must pre-register the project with the Manufacturer before installation has begun. Following project completion, contractor is responsible for completing all warranty registration procedures on behalf of the Owner.
   4. Should the cabling system fail to perform its expected operation within this warranty period due to inferior or faulty material and/or workmanship, the contractor shall promptly make all required corrections without cost to the owner.

B. Certified Installer shall provide labor, materials, and documentation in accordance with Manufacturer requirements necessary to ensure that the Owner will be furnished with the maximum available Manufacturer's Warranty in force at the time of this project.

C. The installed structured cabling system shall provide a warranty guaranteeing the specified performance in the installed channel performance above the ANSI/TIA-568 requirements for Augmented Category 6 (CAT 6A) cabling systems or ISO 11801 requirements for Class E and Class EA, respectively.
   1. Standards-compliant channel or permanent link performance tests shall be performed in the field with a Manufacturer-approved certification tester in the appropriate channel or permanent link test configuration.

D. Necessary documentation for warranty registration shall be provided to the manufacturer by the installer (within 10 days) following 100 percent testing of cables.
   1. Installation Contractor shall submit test results to Manufacturer in the certification tester's original software files.
   2. Installation Contractor shall ensure that the warranty registration is properly submitted, with all required documentation within 10 days of project completion.
   3. Certified Contractor/Integrator must adhere to the terms and conditions of the respective manufacturer's warranty programs.

E. Manufacturer shall ensure that the Owner receives the project warranty certificate within 60 calendar days of warranty registration.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials in manufacturer's standard protective packaging.

B. Do not remove protective packaging until ready for installation.

C. Follow manufacturer's instructions for storage & handling.

D. Protection: Contractor shall take all necessary precautions to protect materials from the following:
   1. Theft
   2. Vandalism/Tampering
   3. Dents
   4. Scratches
   5. Dust
   6. Temperature
   7. Weather
   8. Cutting
   9. Paint
   10. Other Hazardous Conditions

E. Replacement: Contractor shall replace any damaged or lost material as required by Owner or Consultant.

F. Installed Materials: Installed materials remain the responsibility of the Contractor until Acceptance. Contractor shall take necessary precautions to ensure the safety and security of installed materials.

1.09 CONTRACT DRAWINGS AND SPECIFICATIONS

A. The intent of the drawings and specifications is to establish the type of system and functions, but not to set forth each item essential to the functioning of the system. The drawings are generally diagrammatic and show approximate location and extent of work. In case of doubt of work intended, it is the responsibility of the Contractor to request instructions from the Engineer or Owner prior to bid. The Contractor shall be responsible for installing a complete functioning system.

B. Contractor shall review all drawings and specifications before starting the work. Where discrepancies occur, Contractor shall immediately notify Engineer for clarification.

PART 2 – PRODUCTS

2.01 GENERAL

A. Quality of Products: Material and equipment specified herein have been selected as the basis of acceptable quality and performance and have been coordinated to function as components of the specified system. Where a material, device, piece of equipment or system is specified directly, the current manufacturer's specification for the same shall be a part of these specifications, as if completely contained herein in every detail. Each material, device or piece of equipment provided hereunder shall comply with all the manufacturer's published specifications for that item.

B. Quantity: Provide quantity as shown on Contract Drawings, or as otherwise defined herein.

C. Preference: Where more than one manufacturer is listed herein as acceptable or equivalent, preference is intended and implied by the order of listing.

D. Substitutions: Comply with provisions of Division 01. Burden of proof of equivalence is on the Contractor.

E. Provide Complete: Provide all auxiliary and incidental materials and equipment necessary for the operation and protection of the Work of this Section as if specified in full herein.

F. Provide New: All materials provided under the Work of this Section shall be new, shall be the manufacturer's latest design/model, and shall be permanently labeled with the manufacturer's name, model number and serial number.

G. Similar: Similar devices shall be of the same manufacturer, unless specifically noted otherwise in these specifications.

H. Safety Agency Listing: All devices provided under the Work of this Section which are connected to the Project electrical system shall be listed by Underwriters Laboratories (UL), and shall be so labeled.

2.02 TELECOMMUNICATIONS HORIZONTAL CABLING SYSTEM

A. Category cable (data cable)
   1. Category 6a (cat6a) unshielded twisted-pair (UTP) cable
      a. 100-Ohm, 23 AWG, Category 6A 4-pair balanced unshielded twisted pair solid annealed copper
      b. Cable shall be characterized to 750 MHz and UL/ETL Listed by the Manufacturer printed on the cable jacket and package, as well as Intertek (ETL) Verified to TIA-568 Category 6A and ISO/IEC 11801 Class EA requirements for channel, link and component performance to support IEEE 10GBASE-T (802.3an) networks
      c. Maximum Cable Outer Diameter: 0.250”.

d. Documentation available from an independent third-party testing agency that verifies through random sampling that cable components perform at or above the levels contained on their product specifications, not simply at or above the standard.
e. Guaranteed cable balance improves overall performance and reduces emissions which results in error-free performance up to 10 Gigabit Ethernet with full duplex transmission
f. The unshielded twisted pair conductors are surrounded by a non-conductive aluminum/polyester tape and jacketed with flame-retardant polymer alloy to reduce alien crosstalk, reduce cable diameter and improve performance.
g. Provided on spools or reels-in-box to reduce risk of kinking cable upon deployment
h. Cable shall be Plenum-rated (CMP) for any location where plenum cable is required.
i. Category 6A cables shall have the following cable jacket (Yellow) for all outlets.
j. Be made by an ISO 9001 and 14001 Certified Manufacturer.
k. Guaranteed to meet or exceed Channel margin guarantees as stated above under System Performance

Approved Products:
1) Panduit: Yellow, PUP6AS04YL-G (Cat.6A/ Plenum/ Yellow/ solid model/ .250 O.D.)
2) Panduit: Yellow, PUR6AM04YL-CG Cat.6A/ Riser rated/ Yellow/ Matrix Model/ .285 O.D.)

B. Category-Rated Data Connectors (Rj45 Insert Jacks)
1. CATEGORY 6A Mini-Com® TX6A™ 10Gig™ UTP Jack Modules shall be Category 6A performance featuring Split Foil MaTriX Technology. These Category 6A (CAT6A) connectors shall be individual snap-in style, and exceed compliance with TIA/EIA-568-C.2 specifications. The connectors shall comply with the following:
a. The eight position modules shall terminate unshielded twisted 4 pair, 22 - 26 AWG, 100-ohm cable.
b. Comply with FCC Part 68; UL listed and CSA Certified. Verified to exceed all channel performance requirements in TIA-568-B.2-10 from 1 MHz to 500MHz to support the IEEE 802.an standard for 10 Gigabit Ethernet over UTP Cable.
c. Jack module shall use Enhanced Giga-TX™ Technology with forward motion termination to optimize performance by maintaining cable pair geometry and eliminating conductor untwist.
d. The Mini-Com® TX6A™ Jack Modules include Split Foil MaTriX Technology on the external portion of the jack module, which assists in suppressing alien crosstalk. Connector shall have Pair Separation Towers on IDC to facilitate quick, easy terminations without a complete untwist of each pair of conductors.
e. The jack modules shall be universal in design, including complying with the intermateability standard IEC 60603-7 for backward compatibility.
f. The connector shall provide a ledge directly adjacent to the 110-style termination against which the wires can be directly terminated and cut in one action by the installation craftsperson.
g. Connector wiring label shall provide installation color codes for T568B wiring schemes on separate labels.
h. The Mini-Com® TX6A™ 10Gig™ Jack Module must be installed as part of a complete Copper Cabling System in order to achieve 10GBASE-T certified performance.
i. All Category 6A jack modules shall be UL and CSA approved and RoHS compliant.
1) CJ6X88TG**.
2) Where ** = one of 12 colors. See drawings or check with Owner for application.(OR)=Orange,

j. The RJ11 type modules shall be available in six position/three pair USOC coded version and in 11 standard colors. They shall snap into all Mini-Com ® outlets and patch panels. The module shall include a white base to signify Category 3.
   1) CJ66U**
   2) Where ** = one of 12 colors. See drawings or check with Owner for application.

2. Additional Copper Cabling Connectors
   a. Additional Mini-Com® Modules for copper shall include the following:
      1) 50 and 75 Ohm BNC coax coupler modules, male-male
      2) F-Type coax coupler module, male-male threaded
      3) The connectors shall snap into all Mini-Com® outlets and patch panels.

a)	Part Number	Style	Medium	Termination Style	
b)	CMFBA**	F-Type	Copper	Coupler	5
c)	CMFSR**	F-Type	Copper	Coupler	5
d)	CMB**	Blank	-	-	5

C. Faceplates, Frames and Inserts
1. Faceplates (wall plates) secure information outlets to the work area. Contractor shall provide and install single gang faceplate kits to house all jacks as required for all work area outlets, workstation base feeds, and furniture openings. Unused telecom backboxes shall receive a solid blank faceplate.
2. CLASSIC SERIES WITH LABEL AND LABEL COVER Frames shall be vertical, single and double gang frames with combination head screws, screw covers, labels, and a curved designer appearance.
3. The faceplates shall mount onto standard U.S. NEMA boxes and adapters with screw-to-screw dimensions of 3.28" (83.3mm).
4. Each faceplate frame shall accept flat, sloped, sloped shuttered, sloped recessed and blank 1/2 and 1/3 size module inserts that can be individually inserted and removed as required from the front of the frame without removing the frame.
5. Telecommunications faceplates shall:
   b. Utilize a (“QuickPort”) footprint to match the approved connectivity manufacturer, and be made by the same manufacturer as the connectors.
   c. Precisely match colors and materials of the power wiring device plates.
   d. Support any connectivity media type, including fiber, AV and copper applications.
   e. Have write-on or printable designation labels for circuit identification together with a clear plastic cover.
   f. Be available in single-gang and double-gang configurations.
   g. Have surface-mount boxes and standoff rings available for both single and double gang faceplates.
   h. Have single-port blank inserts to match faceplate color, available in packs of 10.
   i. Color shall match nearby electrical devices exactly. Off-color ivories or whites will not be accepted.
   j. Furniture faceplates shall fit existing knockouts for telecom receptacles, and snap in without screw mounts.
   k. Decora® inserts shall hold from 1 to 6 jacks per device plate.
      1) Classic Series: CFP1**
      2) Classic Series: CFP2**
      3) Classic Series: CFP4**
      4) Where ** = one of 12 colors. See drawings or check with Owner for application.

         (IW)=Off White, (AW)=Artic White, (EI)=Electric Ivory, (YL)=Yellow, (OR)=Orange, (BU)=Blue, (VL)=Violet, (WH)=White, (RD)=Dark Red, (GR)=Green, (IG)=International Grey, (BL)=Black

D. Surface-Mount Blocks (SMB)
1. Surface-Mount Blocks (SMBs) are used to protect terminated CAT6A cables at the endpoints where they are not contained within walls or furniture. Example locations may be

Wireless Access Points (WAPs), Group Work Areas fed by conduits run down columns, security cameras, or other network-enabled device locations.

2. Ceiling, WAP, Camera and other non-wallmount locations will use a 2-port plastic SMB.
3. Small Surface-Mount Boxes shall exhibit the following characteristics:
   a. Outlet housings for WAPs and other devices shall be a high-density, low profile design with (1) to (12) field-configurable ports, snap-lock cover, and cable knockouts on back.
   b. Housing cover shall have raceway knockouts for top and bottom entry. Base shall include Tie-wrap anchor points at all cable entrances.
   c. The housing shall be mountable with screws, tape or a single magnet.
   d. The cover shall provide the option of securing it to the base with a screw that is hidden under the outlet identification window.
   e. Shall be constructed of high-impact self-extinguishing plastic rated UL 94V-0, and be UL Listed and compliant with FCC Part 68 and TIA-568 specifications.
   f. 1- and 2-port housings are suitable for installation in air-handling spaces (plenum)

      Approved Products:
      1) CBX1**-A (1 port)
      2) CBX2**-AY (2 port)
      3) CBXJ2**-A (2 port, low profile)
      4) Where ** = one of 12 colors. See drawings or check with Owner for application.

      (IW)=Off White, (AW)=Artic White, (EI)=Electric Ivory, (YL)=Yellow, (OR)=Orange, (BU)=Blue, (VL)=Violet, (WH)=White, (RD)=Dark Red, (GR)=Green, (IG)=International Grey, (BL)=Black

E. Modular Furniture Faceplates
   1. Modular Furniture Faceplates shall be four-port flat or angled and two port angled faceplates that snap directly into TIA/EIA standard furniture openings.
   2. The two port, angled faceplate shall provide a 45° slope to the side, in-line with the cable running through the furniture channel. If required, an extender shall be used with the four-port flat faceplate to provide 12.7mm (0.5”) additional depth.
   3. Each faceplate shall accept Mini-Com modules that can be individually inserted and removed as required.
      a. UICFFP4** (snaps into standard knockouts)
      b. CFFP4** (flat with (4) modules)
      c. CFFPA2** (slopped with (2) modules)
      d. CFFPL4** (flat with label (4) modules)
      e. CFFPLA4** (slopped with label (4) modules)
      f. Where ** = one of 12 colors. See drawings or check with Owner for application.

         (IW)=Off White, (AW)=Artic White, (EI)=Electric Ivory, (YL)=Yellow, (OR)=Orange, (BU)=Blue, (VL)=Violet, (WH)=White, (RD)=Dark Red, (GR)=Green, (IG)=International Grey, (BL)=Black

F. Modular Patch Panels
   1. Telecommunications Room Patch Panels shall be manufactured with empty ports, which allow for the insertion of appropriately-graded and colored jacks.
      a. Available in either 24- or 48-port 2RU versions.
      b. Independently tested and verified by Intertek (ETL) to meet or exceed all TIA component, permanent link, and channel requirements of TIA-568 for Cat 6A, FCC part 68, and IEC 60603-7.
      c. An appropriate cable management bar shall be included with standard density flat panels.
      d. Shall be sized to fit a TIA standard, 19-inch relay rack and hole pattern.
      e. There shall be pre-printed numbers above each port for easy identification and white write on areas for port and/or panel identification on the 24 and 48 port version.

f. The panel shall have vertical and horizontal cord organizers available as to improve patch cord management.
g. Verify angled or flat panel use per design documentation or verification with Owner's Representative.
1) Approved Products:
2) Mini-Com Flush Mount Modular Angled Patch Panel, 24 Port, CPPA24FMWBLY
3) Mini-Com Flush Mount Modular Angled Patch Panel, 48 Port, CPPA48FMWBLY

G. Copper Patch Cords
1. Category 6a patch cords
a. TX6A™ 10Gig™ Patch Cords shall be constructed with Category 6A 23 / 26-AWG stranded cable featuring MaTriX Technology. Patch Cords shall be factory terminated with modular plugs featuring a one-piece, tangle-free latch design and black strain-relief boots to support easy moves, adds and changes. TX6A™ 10Gig™ Patch Cords have incorporated MaTriX Technology and a barrier tape into the patch cable design to help suppress alien crosstalk and improve internal electrical performance. Patch cords shall be wired to be compatible with both T568A wiring schemes.
b. The patch cords shall be ETL verified ANSI/TIA-568-C.2Category 6A and IEC/ISO 11801Class EA channel performance. Each patch cord shall be 100% performance tested at the factory in a channel test to the ANSI/TIA-568-C.2 and IEC/ISO standards. The TX6A™ 10Gig™ Patch Cords must be installed as part of a complete TX6A™ 10Gig™ UTP Copper Cabling System in order to achieve 10GBASE-T certified performance.
c. Patch Cords shall be Contractor furnished/Owner Installed (CFOI)
1) Part numbers:
2) UTP6ASD5**
3) UTP6ASD10**
4) Where ** = one of 10 colors. See drawings or check with Owner for application. (YL)=Yellow,
d. Provide Category 6A data patch cords, Panduit or approved equal for 50% of all data connections.
e. Provide 10', Panduit UTP6ASD*** yellow for workstation use and 5' lengths, Panduit UTP6ASD***yellow for closet use.

2.03 GROUNDING AND BONDING

A. Wall-Mount Busbars
B. Telecommunications Main Grounding Busbar (TMGB)
1. Telecommunications Main Grounding Busbar (TMGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
2. Telecommunications Main Grounding Busbar (TMGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
3. The busbar shall be 4" (100 mm) high and 20" (510 mm) long and shall have 30 attachment points (two rows of 15 each) for two-hole grounding lugs.
4. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 27 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4) mm) hole centers.
5. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall.
6. The busbar shall be UL Listed as grounding and bonding equipment.
7. Design Make shall be:
8. Chatsworth Products, Inc. (CPI),
9. Telecommunications Main Grounding Busbar:
10. Part Number 40153-020, 20" x 4" (510 mm x 100 mm) Telecommunications Main Grounding Busbar, UL Listed.

C. Telecommunications Grounding Busbar (TGB)

1. Telecommunications Grounding Busbar (TGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
2. The busbar shall be 2" (50 mm) high and 12" (300 mm) long and shall have 9 attachment points (one row) for two-hole grounding lugs.
3. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 6 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers.
4. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall.
5. The busbar shall be UL Listed as grounding and bonding equipment.
6. Design Make shall be:
7. Chatsworth Products, Inc. (CPI),
8. Telecommunications Grounding Busbar:
9. Part Number 13622-012, 12" x 2" (300 mm x 50 mm) Telecommunications Grounding Busbar, UL Listed.

D. Grounding Conductors
   a. Bare stranded copper ground conductors shall be provided and installed by the Contractor as shown on the project drawings to provide a grounding system consistent with the 2016 National Electric Code as well as TIA 607B.
   b. Ground conductors shall be minimum 6 AWG between MDF/IDF Closets, and the Building Service Ground point and minimum 6 AWG green jacketed cable between hardware components located within the MDF/IDF closets.

2.04 BACKBONE CABLING SYSTEMS

A. Interbuilding Backbone Copper Cable
   1. Conductors-Solid, annealed copper, 24 AWG.
   2. Insulation-Solid, high density polyethylene, color coded in accordance with telephone industry standards.
   3. Twisted Pairs-Insulated conductors are twisted into pairs with varying lay lengths to minimize crosstalk.
   4. Core Assembly-25 pairs & less: pairs are assembling together in a single group. More than 25 pairs are arranged in groups or binders, each binder having a color-coded unit binder.
   5. Filling Compound-The entire core assembly is filled with ETPR compound, filling the interstices between the pairs and under the core tape.
   6. Core Wrap Non-hygroscopic dielectric tape applied longitudinally with an overlap.
   7. Aluminum Sheath-Corrugated, copolymer coated, 0.0008" aluminum tape applied longitudinally with an overlap. The sheath interfaces are flooded with an adhesive water blocking compound.
   8. Jacket-Black, low density polyethylene.
      1) Other multiples of 25 acceptable (50, 100, 200, 300pr as required or applicable)
   9. Acceptable Manufacturer: General Cable

B. Intrabuilding Riser Cable
   1. Multi pair riser twisted pair Cable Conductors category 5e.
      a. Conductors-Solid, annealed copper, 24 AWG.
      b. Twisted Pairs-Insulated conductors are twisted into pairs with varying lay lengths to minimize crosstalk.
      c. Core Assembly-25 pairs & less: pairs are assembled together in a single group. More than 25 pairs are arranged in groups or binders, each binder having a color-coded unit binder.
      d. Core Wrap-Non-hygroscopic dielectric tape applied longitudinally with an overlap.
      e. Category 25-pair 5e cable shall have a GRAY cable jacket.

         Acceptable Manufacturers:
         1) General Cable: Blue Jacket CMR (non-plenum), 2133694E

2) General Cable: Gray Jacket CMR (non-plenum), 2133269E
3) General Cable: White Jacket CMP (plenum), 2131550E
4) Riser rated, CMR rated jacket.
5) Plenum rated, CMP rated jacket.

C. Horizontal 25 Pair Telephone Interconnect Cables
1. Category 3 25 Pair Voice Cable
a. Conductors-24 AWG solid bare annealed copper.
b. Sequential footage markers located on the jacket.
2. Compliances:
a. ISO/IEC 11801
b. ANSI/TIA 568-B.2
c. UL Listed Type MPP/CMP, MPR/CMR
3. Category 3 25-pair cable shall have a WHITE cable jacket
Acceptable Manufacturers:
1) General Cable: White Jacket CMP (plenum), 2131505
2) Plenum rated, CMP rated jacket.
b. Other multiples of 25 acceptable (50, 100, 200, 300pr as required or applicable)

D. Wall-Mount Termination Fields:
1. Wall-mounted 110-style termination frames with legs
a. 110 Style termination/wiring blocks for cross connecting between voice station and riser cables shall be provided and installed as shown on the project plans.
b. 110 blocks shall be wall-mountable and manufactured with standoff legs to allow cables to pass behind. All required connecting blocks (4-pair and 5-pair), and labeling strips shall be included.
c. Connecting Blocks shall be Category 6 for all voice station cable installed.
d. Connecting Blocks shall be C-4 for all station cable installed.
e. Connecting Blocks shall be C-5 for all riser cable installed.
f. Acceptable Manufacturers: Cross-connects and wall terminations blocks will be: Panduit

1)	GPB24-X	Standard Density Base	24 port	Rack/Frame
2)	GPB72-X	Standard Density Base	72 port	Rack/Frame
3)	GPBW72-X	Standard Density Base	72 port	With Legs
4)	GPB144-X	High Density Base	144 pair	Rack/Frame
5)	GPB432-X	High Density Base	432 pair	Rack/Frame
6)	GPBW144-X	High Density Base	144 pair	With Legs
7)	GPBW432-X	High Density Base	432 pair	With Legs
8)	GPCB4-X	High Density Connector	4	

E. Communication Entrance Protection:
1. Wall-mount 5-pin circuit protector blocks:
a. Provide multi-pair tails or 110-style input/output terminations per application.
b. Provide 5-pin, solid state surge arresters for each position on circuit protection panel C4B1S Series, or approved equivalent.
c. Circa use: 1880ENA1-25G, 1880ENA1-50G and 1880ENA1-100G, or approved equivalent.
d. Porta Systems, or approved equivalent
e. Systimax 710-SLC-25 filled modules, or approved equivalent.
2. Fiber Optic:
a. Provide as close as practicable (within 50-feet) of where OSP cable enters building in a duct or conduit system. Size splice cases(s) to accommodate strand count of the cable(s) entering building. Splice case must be capable of bonding to the Telecommunications Main Grounding Bus Bar (TMGB). Complete with end caps to

properly seal cable from expanding water blocking gel. Approved manufacturers: Preformed, Corning, and 3M.

3. Miscellaneous Hardware:
   a. Provide supporting hardware, cable ties, labels, underground vault racking, bullet bonds, gel blocking kits, mule tape, and other miscellaneous hardware for a complete and operable system.

F. Fiber Optic Cable
   1. SINGLEMODE Optical Fiber Cable
      a. Optical fiber cables run shall be low-water-peak Singlemode (OS2), and meet all the requirements delineated within the specifications of ANSI/TIA-568 and ANSI/TIA-492.AAAC-B.
      b. Armored fiber optic cables will utilize an interlocking armor outer cover around an integrated tight-buffer (indoor only) or Loose-Tube (indoor/outdoor) cable construction. Plenum armored fiber may be run in open ceilings without conduit or innerduct.
      c. Indoor fiber optic cable shall be minimum 12 strands, typically 24 strands, tight buffered, and individual fiber strands shall be 900 micron jacketed.
      d. Outdoor or indoor/outdoor fiber optic cable used for building-to-building interconnections shall be minimum 24 strands, loose tube construction with 250-micron unjacketed fiber strands in a 12-strand buffer tube.
      e. Cables are typically OFNR rated for in-conduit applications, but must always be constructed of materials and rated appropriate for the environment in which it is installed (Indoor, Indoor/Outdoor, Outside Plant (OSP), OFNP or OFNR, OFCP or OFCR). In-slab conduits are considered a “wet environment” and require OSP or Indoor/Outdoor rating. Cables running at least a portion of the length through an open-air plenum or air handling space must be OFNP or OFCP (plenum) rated. Contractor is solely responsible for installation of the correctly-rated cable in the appropriate environment, as required by the AHJ or local ordinance
      f. Loose tube fibers shall utilize a fan-out kit to fit 250-micron fibers into a 900-micron protective sheath when terminating. Loose Tube cables are generally expected for outdoor environments.
      g. See plans and scope of work for total strand count between locations.

         Approved Products:
         1) Fiber Optic Pigtail: F9TSR17NNSNM001
         2) 12-Strand – APO121PNR
         3) 12-Strand – APO121PNU
         4) Grounding Kit
         5) Or other strand counts as specified

G. MUTLIMODE Optical Fiber Cable
   1. Multimode fiber optical fiber cables shall meet all of the requirements delineated within the specifications of ANSI/TIA-568 and ANSI/TIA-492.CAAB (OM4). Must be a minimum of 12 strands, of Laser-Optimized 50 micron Armored optical fiber. Cable jacketing must be appropriate for the environment in which it is installed (Indoor, Indoor/Outdoor, Outside Plant, OFNP or OFNR).
   2. Fiber optic cables will utilize an interlocking armor outer cover around an integrated Tight-Buffered (indoor only) cable construction and fiber strands with a 900-micron protective sheath.
   3. See plans and scope of work for total strand count between locations.

      Approved Products:
      1) Fiber Optic Pigtail: FZTSR17NNSNM001
      2) Furnish 12-fiber, 24” fan-out Kit: FO6CB and/or FO12CB
      3) 12-Strand – BLO121PNU

4) 12-Strand – BLO121PNR
5) Grounding Kit
6) Or other strand counts as specified

H. Outside Plant Fiber Optic Cable
1. Multimode Fiber cable will be 50/125 micron (Suggest 12 strand)
2. Singlemode Fiber cable will be 8.3/125 micron (Suggest 12 strand)
3. OSP fiber shall be loose tube, all dielectric, armored outdoor cable.
4. Riser cable shall be tight buffered all dielectric, Indoor/Outdoor cable.
5. The multimode fiber cable must comply with the following minimum transmission parameters of 40Gbe and 100Gbe.
6. Outdoor design shall offers water blocking for aerial and duct applications for standards compliance and flexibility for outdoor use.
7. Bend radius: Dynamic: 20 x Cable O.D.; Static: 10 x Cable O.D
   a. Acceptable Manufacturers of fiber cable are Panduit:
      1) General Cable, OSP Loose Tube Single Jacket 12 Strand Multimode OM4 Fiber cable, Part number: BL0124M1A-DWB
      2) General Cable, OSP Loose Tube Armored 12 Strand Multimode OM4 Fiber cable, Part number: BL0124M1F-DWB
      3) General Cable, OSP Loose Tube Single Jacket 12 Strand Multimode OM4 Fiber cable, Part number: BL0124M1A-DWB
      4) General Cable, OSP Loose Tube Single Jacket 12 Strand Multimode OS2 Fiber cable, Part number: AQ0124M1A-DWB
      5) Furnish 12-fiber, 24” fan-out Kit: FO6CB and/or FO12CB
      6) Grounding Kit
      7) ** = total number of strand count

I. Rack-Mount Fiber Optic Enclosures, Panels and Trays
1. All Fiber enclosures shall provide cross connect, inter connect, and splicing capabilities and contain cable management for supporting and routing the fiber cables/jumpers.
2. Fiber Adapter panel openings shall accept Fiber Adapter Plates (bulkheads).
3. 2RU and 4RU enclosures shall hold up to 3, 6 or 12 adapter plates
4. All Fiber enclosures, panels and trays (units) shall provide cross-connect, inter-connect, and splicing capabilities and contain cable management for supporting and routing the fiber cables/jumpers.
5. Fiber enclosures shall exhibit the following characteristics:
   a. Fiber enclosure shall be available in 2RU or 4RU versions to accommodate fiber adapter plates, MTP Modules, and/or termination and splicing of fiber as needed
   b. Enclosures shall have a sliding tray which can be removed completely from enclosure (from front or rear) to facilitate field terminations and splicing. Sliding tray glides forward and backward providing accessibility to front and rear bulkhead after installation.
   c. 17" depth for high density fiber termination and/or splicing.
   d. Removable transparent hinged doors and slide away covers allow easy access during install and visibility of interior after installation.
   e. Patch cord bend radius guides minimize macro bending.
   f. Stackable and adjustable fiber rings simplify cable routing and organization
   g. Fiber Jumper saddles pivot for improved patch cord routing and organization
   h. Removable rubber grommets protect cable and minimize dust build-up
   i. Multiple mounting bracket positions for 19" rack and cabinet installation.
   j. Constructed of durable polycarbonate plastic and 16-gauge steel, powder-coated black
   k. Door lock option available on front, rear, or both doors
   l. Fiber cable management shall allow for routing, storage, and protection of patch cords, tight-buffer fiber, and backbone cables.
   m. Enclosure shall be available either empty or in custom pre-loaded configurations.
      Approved Products:
      1) Rack-Mount Enclosure, FRME2 (2RU)

2) Rack-Mount Enclosure, FRME4 (4RU)

J. Fiber Connectors
1. Pre-polished fiber optic connectors shall be the primary means of field-terminating individual fiber strands at the enclosure or faceplate location.
2. Shall meet or exceed the requirements described in TIA-568 and ANSI/TIA-604-10 (LC) Connector Impermeability Standards
3. Shall be pre-polished and field installable to eliminate the need for hand polishing, bonding, or epoxy in the field.
4. Shall utilize a precision zirconia ceramic ferrule, and be re-terminable up to 3 times during testing without loss of performance.
5. Shall require the use of a cleaver with a guaranteed maximum cleaving angle of 2 degrees for multimode and 1 degree for singlemode fibers.
6. Shall be provided in LC, single-mode or multimode (laser optimized) configurations, terminated on 250 or 900 μm buffered fiber and/or 2mm or 3 mm jacketed fiber.
7. Maximum connector insertion loss shall be no greater than 0.5 dB, with an average of 0.1 dB (MM) or 0.2dB (SM). Typical connector return loss shall be 35 dB (multimode) and 56 dB (single mode). All versions shall allow continuity to be verified by use of a visual fault locator (VFL).
   a. Panduit LC OptiCam® Pre-Polished Fiber Optic Connectors OM4 Multimode / 10Gig™ 50/125µm (laser optimized) simplexP/N: FLCSMCXAQY
   b. Panduit LC OptiCam® Pre-Polished Fiber Optic Connectors OS2 Singlemode / 10Gig™ 9 /125µm (laser optimized) simplex P/N: FLCSSCBUY

K. Fiber Adapter Plates
1. The fiber adapter plate shall be modular and functional for use in either a wall-mount or rack-mount enclosure. The adapter plate shall be provided in LC styles, in 12- or 24-fiber configurations. 12-fiber adapter plates are used to terminate 12-fiber cables, and 24-fiber adapter plates are used to terminate 24-fiber (or greater) cables. Do not utilize adapter plates with unused ports at the rear.
2. The adapter plate shall be compliant to TIA-568 (for performance) and respective TIA-604-X (for intermateability) standards. Adapter plates shall use zirconia ceramic sleeves and be offered in standard fiber type colors pursuant to TIA-568 standards.
3. LC adapter plates shall be precision-molded in the USA and integrated to eliminate “rattle” and loose fit. All ferrules shall be zirconia-ceramic. Adapter plates shall be offered in standard fiber type colors. Singlemode color shall be BLUE.

   Approved Products:
   a. Panduit, FAP12WBUDLCZ, FAP w/12 LC Dupl Adapters (BU) Zirconia
   b. Panduit, FAP12WAQDLCZ, FAP w/12 LC 10 GbE Dupl mm Adapters (AQ) Zirconia

L. Fiber Jumpers and Array Cords
1. Fiber optic LC-LC patch cords, or jumpers, will make LC connections from the rack termination points to the equipment. The jumpers will meet the following requirements:
   a. Factory-manufactured using Singlemode OS2 optical fiber. Field terminations on fiber jumpers are not acceptable.
   b. Shall utilize A-B polarity.
   c. Shall exhibit <0.3 dB insertion loss and -25 dB return loss.
   d. Shall be available in standard lengths of 2 meters and custom-orderable up to any length of feet or meters
   e. Provide factory assembled patch cords meeting or exceeding all criteria specified in the horizontal cabling standard
   f. Provide Duplex Fiber Optic Patch Cords, Panduit or approved equal
      1) Provide (1) ea., 2 meters in length, LC-LC Duplex fiber jumpers
         Approved Products:
      1) Panduit LC-LC SM duplex jumper, F92ERQNQNSNM002

2) Panduit LC-LC MM OM4 duplex jumper, FZ2ERQNQNSNM002

2.05 CABLE SUPPORT HARDWARE AND MISCELLANEOUS MOUNTING EQUIPMENT

A. Miscellaneous Equipment: shall be provided and installed by the Contractor as described below and on the drawings. Mounting hardware and accessories typically required to provide a complete and working installation but not listed in these specifications shall be provided and installed by the Contractor.

B. Backboard Cable Management: shall be provided and placed by Contractor on all telecommunications backboards to provide effective routing of all telecommunications cabling. Contractor shall utilize D-rings, wire distribution spools, and cable clamps as required for a neat and organized installation.

C. Wall Termination Devices: 110 blocks and primary protection blocks will be provided at all wall termination fields. Primary protector blocks will be provided on both ends of all copper outside plant cables. 110 blocks will be installed with appropriate standoffs and brackets for a complete installation.

D. J-Hook assemblies:
   1. All cable shall be supported above ceiling on dedicated cable support hardware.
   2. Contractor is responsible for maintaining the maximum fill guidelines and spacing requirements as shown on the accompanying project plans. Contractor shall provide and install additional J-hook assemblies as required to meet these requirements.
   3. J-hook horizontal cable supporting hardware shall be UL listed. The J-hook(s) shall provide a broad base for proper cable support, thereby reducing stress and bending of cabling.
      a. Contractor shall attach appropriate J-hook fasteners for wall, stud, beam, or flange mounting to the supporting structure. Fasteners shall be spaced a maximum of 5' apart, and no more than 4' from the final outlet destination or turn point as shown on the accompanying project drawings.
      b. Cable saddles and J-hooks shall be used where cable tray or wire basket is not available. These must be supported on their own ceiling wires, threaded rod, or affixed to building structure by use of beam clamps (on metal beams) or wood screws (on wood beams). Affixing communication cable supports to existing ceiling support wires is not allowed.

         Acceptable Product:
         1) Caddy CableCat Clips
         2) Erico
         3) B-Line
         4) Panduit
         5) Required supporting hardware, or approved equivalent.

E. 110 Style Termination / Writing and Connecting Blocks
   1. 110 Style termination/wiring blocks for cross connecting between voice station and riser cables shall be provided and installed as shown on the project plans. 110 blocks shall be wall-mountable and manufactured with standoff legs to allow cables to pass behind. All required connecting blocks (4-pair and 5-pair), and labeling strips shall be included.
   2. Connecting Blocks shall be Category 6 for all voice station cable installed.
   3. Connecting Blocks shall be C-5 for all riser cable installed.

      Acceptable Manufacturers:
      a. Panduit GP6™ PLUS Punchdown System:96 pair (24-port) base with legs:GPBW24-X
      b. C-4 Connecting block: Panduit 4 pair P/N: GPCB4-XY)
      c. 110 blocks, Panduit P/N: 288 pair (72-port) base with legs: GPBW72-X

d. Connecting blocks, Panduit 5 pair P/N: GPCB5-XY

2.06 FIRESTOPPING

A. Fire rated pathway devices shall be the preferred product and shall be installed in all locations where frequent cable moves, add-ons and changes will occur. Such devices shall:
   1. Meet the hourly rating of the floor or wall penetrated.
   2. Permit the allowable cable load to range from 0% to 100% visual fill thereby eliminating the need to calculate allowable fill ratios.
   3. Permit multiple devices to be ganged together to increase overall cable capacity.
   4. Allow for retrofit to install around existing cables.
   5. Include an optional means to lengthen the device to facilitate installation in thicker barriers without degrading fire or smoke sealing properties or inhibiting ability of device to permit cable moves, add-ons, or changes
   6. Not require any additional action on the part of the installer to open or close the pathway device or activate the internal smoke and fire seal, such as, but not limited to:
      a. Opening or closing of doors.
      b. Twisting an inner liner.
      c. Removal or replacement of any material such as sealant, caulk, putty, pillows, bags, foam plugs, foam blocks, or any other material.
   7. Where single cables (up to 0.27 in. (7 mm) diameter) penetrate gypsum board/stud wall assemblies, a fire-rated cable grommet may be substituted. Acceptable products shall be molded from plenum-grade polymer and conform to the outer diameter of the cable forming a tight seal for fire and smoke. Additionally, acceptable products shall lock into the barrier to secure cable penetration.
   8. Where non-mechanical products are utilized, provide products that upon curing do no re-emulsify, dissolve, leach, breakdown or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic during or after construction.
      a. Where it is not practical to use a mechanical device, openings within floors and walls designed to accommodate telecommunications and data cabling shall be provided with re-enterable products that do not cure or dry.
      b. Utilize an EMT sleeve as a stub through a rated wall
      c. Surround annular space between EMT sleeve and wall material with a hardening intumescent caulk.
      d. Utilize re-enterable, non-hardening putty around cables inside a metal sleeve. Do not exceed 40% fill capacity of sleeve and follow all rated assembly requirements per Manufacturer, local codes, and AHJ.
   9. Cable trays shall terminate at each barrier and resume on the opposite side such that cables pass independently through fire-rated pathway devices. Cable tray shall be rigidly supported independent from fire-rated pathway devices on each side of barrier.
   10. Clean surfaces to be in contact with fire stopping materials of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting or the required fire resistance.
   11. Install fire stopping materials as indicated, in accordance with manufacturer's instructions.
   12. Seal all holes or voids made by penetrations to ensure an effective smoke barrier.
   13. Unless protected from possible loading or traffic, install fire stopping materials in floors having void openings of 4 square inches or more to support the same floor load requirements.
   14. A small amount of hydrogen gas is released as foam cures. Use forced air ventilation when installing if areas of installation have less than 2 cubic feet of free air for each pound of liquid mixture being foamed.
   15. Examine fire stopped areas to ensure proper installation prior to concealing or enclosing fire stopped areas.

Approved Products:

a. Specified Technologies, Inc. EZ-PATH series 22, 33 and 44+ fire-rated pathway devices
b. Specified Technologies, Inc. EZ-PATH GROMMET
c. Specified Technologies, Inc. SSS Intumescent Caulk
d. Specified Technologies, Inc. SSP Intumescent Putty

2.07 LABELING

A. All labeling shall be in accordance with and strictly adhered to TIA-568, TIA-606 (Class 2 Administration) and BICSI Standards.

B. Provide machine-generated labels appropriate for all components supplied and installed. Under no circumstances shall hand written labels be used.

C. The labeling scheme shall not include duplicates of any new or existing cable identification across the entire cable plant.

D. The labeling scheme will be provided at all locations within the cable infrastructure.

E. All cables shall be labeled, using the owners cable identification standard.

F. Intrabuilding Cable: All Intrabuilding cables will be labeled. Provide legible and indelible marking on all cables as indicated in the Drawings. Contractor shall ensure labeling of the cables during installation.

G. Interbuilding Cable: All Interbuilding cables will be labeled. Provide legible and indelible marking on all cables as indicated in the Drawings. Contractor shall ensure labeling of the cables during installation.

H. Each faceplate, cable, or data outlet (drop) will be numbered with a unique identifier clearly indicating the voice and data jacks by floor number, station, and outlet identification. This labeling scheme will be independent of any assigned telephone numbers.

I. Cables
   1. Horizontal and backbone cables shall be labeled at each end according to Owner labeling standards (see below). The cable or its label shall be marked with its identifier.
   2. Cable labels shall be machine-generated wrap-around labels with multiple cable ID's printed such that it can be viewable in place without turning the cable.
   3. Label cables within 6" of termination point at both ends.

J. Faceplates
   1. A unique location identifier shall be marked on each faceplate to identify its location in the cable plant.
   2. Each port in the faceplate shall be labeled with its own unique identifier.

K. Racks, Panels, Blocks
   1. A unique identifier shall be marked on each piece of connecting hardware to identify it as connecting hardware.
   2. Each port on the connecting hardware shall be labeled with its own identifier to match the other end of the cable.

2.08 FLOOR MOUNT EQUIPMENT RACKS

A. Two-Post Equipment Standard Relay Rack, Chatsworth Products, Inc. (CPI)
   1. Racks shall be rectangular in shape, manufactured from steel, welded construction with two pairs of removable (bolt-on) equipment mounting rails.
   2. The top of the rack shall be pre-punched with attachment holes for cable runway and a top-mount cable management jumper tray. The sides of the rack shall be pre-punched with attachment points for power strips, Snap-On cable guides and vertical cable managers. The bottom of the rack shall be pre-punched with attachment points for a junction box and attachment to the floor.
   3. Equipment mounting rails shall be L-shaped, set 6" (150 mm) or 3" (80 mm) apart and punched on the front flange with the EIA-310-D Universal hole pattern to provide 44 rack-mount spaces for equipment. Each mounting space shall be marked and numbered on the

mounting rails. Mounting rails shall be removable and reversible so that RMU numbering can start at the bottom or top of the rack.

4. Equipment-mounting rails shall be horizontally spaced to allow attachment of 19” EIA or 23” rack-mount equipment. Attachment points shall be threaded with 12-24 threads.
5. The rack shall have two masked ground connection points located near the top and bottom of the frame and will include a ground terminal lug to attach ground conductors from the Telecommunications Grounding Busbar. Equipment mounting rails will bond to the rack through assembly hardware.
6. The rack shall measure 7’ (2.1 m) high, 24” (610 mm) wide and 15” (380 mm) deep at the base. The sides of the rack frame shall be 9.6” (294 mm) deep.
7. The rack shall be rated for 1,000 lb. (453.6 kg) of equipment in seismic areas and meet Telcordia Technologies GR-63-CORE Network Equipment Building Systems (NEBS) Zone 4 requirements.
8. Finish shall be epoxy-polyester hybrid powder coat in the color as specified below. Mounting rails will be painted to match or zinc-plated.
9. Part Number 55053-703, Standard Rack, 7’H (2.1 m) x 20.3” W (515.9 mm) x 15” D (381.0 mm), 45U x 19” EIA, Black, UL Listed.
10. Each rack must have one (1) 6' long 125V 15A multiple-outlet power strips each with twenty three-prong outlets and no switch, Chatsworth 12848-701. These power strips, with standoff mounting legs, must be installed vertically at the rear of the rack, with the bottoms of the power strips about 6" off the floor. The power strips must be UL-listed. All power strips must be furnished with a 15' three prong plug/cord, NEMA 5-15P.

2.09 EQUIPMENT ROOM CABLE MANAGEMENT

A. Horizontal Cable Management System
   1. Product Description: Panduit, NetManager P/N: NM2, or approved equal, 3"x3" front, 2"x 5" back, mountable in an EIA standard 19" rack.
   2. Provide 3 per new installed rack
   3. Provide to ITD / Telecommunications for installation.
   4. Note: Do Not utilize Horizontal wire management between angle patch panels.

B. Vertical Cable Management System
   1. Product Description: Panduit, PR2VD06, or approved equal, 7’ Vertical Wire Manager, side mount with covers.
   2. Location: Both sides of Floor Mount Equipment Racks and in-between racks.

C. Distribution Rings/Jumper Troughs
   1. Product Description: Panduit P110JTW-X or approved equal.
   2. Location: On all backboards as required for routing of voice cables in a neat fashion.

2.10 LADDER RACKING

A. Cable Ladder Sections and Components
   1. General: Except as otherwise indicated, provide metal cable ladders, of types, classes and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features.
      a. Materials and Finish: Material and finish specifications for each cable ladder type are as follows:
      b. 1.5” Tubular Steel: Straight section and fitting side rails and rungs shall be extruded from ASTM A513 steel tube. All fabricated parts shall be finished with a black powder coat.

B. Type of Cable Ladder System
   1. Ladder type cable ladders shall consist of two longitudinal members (stringers) with transverse members (rungs) welded to the stringers. Rungs shall be spaced 9" inches on center. Rung spacing in radius fittings shall be 9 inches and measured at the center of the cable ladder's width. Rungs shall have a minimum cable bearing surface of 1” with

radius edges. No portion of the rungs shall protrude below the bottom plane of the side rails.

2. Straight cable ladder sections shall have side rails fabricated as tubular steel channels. All straight sections shall be supplied in standard 10'-foot lengths, except where shorter lengths are permitted to facilitate cable ladder assembly lengths as shown on drawings.
3. Cable ladder widths shall be 12" inches as indicated on drawings.
4. Splice plates shall be the bolted type made as indicated below for each cable ladder type. The resistance of fixed splice connections between an adjacent section of cable ladder shall not exceed .00033 ohm. Splice plate construction shall be such that a splice may be located anywhere within the support span without diminishing the cable ladder rated loading capacity.
5. All splice materials shall be made of ASTM A570 structural steel using carriage bolts and serrated flange locknuts. Hardware shall be Yellow Zinc Dichromate. Chatsworth # 16299-001 or approved equal.
6. Cable ladder Supports: Shall be placed so that the support spans do not exceed a maximum span of 5' feet. Supports shall be constructed from formed shape channel members 1 5/8" x 1 5/8" with necessary hardware such as trapeze support kits, ceiling support kits, triangular support brackets, or wall angle support kits as manufactured by Chatsworth Products or engineer approved equal.
7. Trapeze hangers shall be supported by 3/8" (minimum) diameter all thread rods.
8. Accessories - special accessories shall be furnished as required to protect, support, and install a cable ladder system. Accessories shall consist of but are not limited to; section splice plates, expansion plates, blind-end plates, specially-designed ladder drop-outs, barriers, etc.

C. Acceptable Manufacturers
   1. Manufacturer: Subject to compliance with these specifications, cable ladder and cable channel systems to be installed shall be as manufactured by Chatsworth, Inc. or engineer approved equal.

PART 3 – EXECUTION

3.01 INSTALLATION REQUIREMENTS

A. Furnish and install materials necessary for a complete and working system.

B. Contractor must be a Certified Installer for selected manufacturer prior to, during, and through completion of the system installation, and must be able to provide the manufacturer's extended warranty.

C. Perform work in a neat and workmanlike manner.

D. Determine requirements for plenum rated cable and devices. When doubt exists, seek prior determination in writing by AHJ.

E. Install cable after interior of building has been physically protected from the weather and mechanical work likely to damage cabling has been completed.

F. Contractor shall give notice to all agencies requiring advance notification and comply with all regulations specified by all governing agencies having jurisdiction (AHJ) over the performance of the work.

G. Before installing cabling, ensure cable pathways are completely and thoroughly cleaned:
   1. Inspect conduit, wireway, cable trays, and innerduct systems prior to installation.
   2. Swab any additional enclosed raceway and innerduct systems.

H. Contractor shall coordinate with and abide by the construction schedule and sequencing as dictated by the General Contractor on the project. Storage and staging areas within the construction site shall be as dictated by the General Contractor.

I. Provide protection for exposed cables where subject to damage. Provide abrasion protection for any cable or wire bundles, which pass through holes or across edges of sheet metal.

J. The contractor shall provide and pay all permits.

K. The contractor shall provide all labor, materials, equipment, tools, utilities and services necessary for the proper execution and completion of the telecommunications cabling system.

L. Proper cable handling is critical to maintaining the design integrity of high-performance cabling. Cable handling recommendations include:
   1. Cable must be conditioned above 32 degrees F for 48 hours prior to installation.
   2. Do not use excessive force when pulling cable. The maximum pull-force guideline for a 4-pair horizontal UTP should not exceed 110N (25lbf). Meeting this guideline avoids stretching conductors during installation and the associated transmission degradation.
   3. The minimum bend radius for UTP should not exceed 4 times the cable outside diameter (O.D.) The O.D. of Cat 6A 100 ohm, balanced UTP cable is .30 in. (4 x .3 = 1.2 in. bend radius).
   4. The minimum bend radius for fiber should not exceed 10x the cable outside diameter.
   5. Traditional combing and dressing (bundling) of Category 6A cabling for a combed appearance is required in all exposed locations.
   6. In TR, use appropriate horizontal cable management for patch cords on front of patch panels. Also, use appropriate cable management bar(s) for support of terminated horizontal cable.
   7. Do not use vinyl or plastic cable ties due to the potential for over-cinching of cable bundles which can alter the cable geometry and degrade the system cabling performance. Use only hook and loop (“Velcro”) fasteners for bundling of horizontal cables.
   8. Install cable ties and other cable management clamps via hand so that it fits snugly. Do not over tighten or use mechanical tools which could compress, crimp, or otherwise change the physical characteristics of the cable jacket or distort the placement of twisted-pair components. Replace any cable exhibiting stresses due to over tightening of cable management devices.
   9. Store cable slack in an extended loop configuration to alleviate cable stress. Excessive cable slack in bundled loops or traditional ‘service loops’ to provide additional cable length in TR has been shown to degrade cabling performance and are not recommended.

3.02 INSTALLATION METHODS

A. Contractor is required to adhere to the following parameters whether or not Contractor and/or others have placed existing equipment. Contractor will notify the owner of any of the following requirements that cannot be met prior to bid or ordering of materials.

B. General: Install an infrastructure cabling system as detailed by the contract drawings, details, and specifications.

C. The maximum length of horizontal cabling from nearest closet to an outlet shall not exceed 295 feet as per TIA 568 standards. Contractor will notify the owner prior to commencement of any installation not meeting the 295-foot maximum distance limitation.

D. Contractor will place all station cables in the ceiling area on Contractor supplied and installed wire hangers or in floor spaces and raceways. Contractor also will assess whether or not the ceiling space is a plenum air return, which shall dictate the use of the listed plenum type, or PVC type cable required in the materials specification section. The cables will be routed to the MDF/IDF locations, utilizing cable tray. Station cables must be strapped every 5 feet with tie straps in J-Hooks provided by the Contractor; strapping to any other wires (e.g., lighting, ceiling grid, etc.) is not permitted. Cable splicing at any point of a station cable is unacceptable. When cables are routed in non-ceiling spaces, such as below raised flooring, the Contractor will still assess whether or not the space is a plenum air return and pull the appropriate cable type.

E. In hard wall (wallboard) or V wall type construction where accessible, Contractor will install a wall board adapter or equivalent, which will support mounting of the faceplate necessary for the jacks. This will eliminate the need for an electrical box (in-wall junction box) to accommodate the communications outlet.

F. Cables will be run vertically in dedicated EMT conduit inside the wall and into the ceiling space. Once in the ceiling space, the cable will be routed to the closest cable tray. Cables shall be routed to their closest MDF/IDF utilizing the shortest path possible, while still following TIA standard guidelines. Station cables outside of cable tray must be strapped to tie wires with J-Hooks every 5 feet provided by Contractor; strapping to any other wires (e.g., lighting, ceiling grid, etc.) is not permitted.

G. In areas where modular furniture is installed or in areas where office furniture is in an open office space, telecommunications cabling access will either be through the floor or from the ceiling.

H. Where the cable access is from a duct under the floor, the Contractor will provide and install mounting hardware inside the floor box that will support the outlets.

I. The Contractor will provide and install a plastic spiral wrap device or metal flexible conduit to the cable channel in the furniture or to a surface mount box located at each work station. The Contractor shall coordinate with the owner, the exact location of each cable termination and jack location.

J. UTP cabling must conform to a 6-foot separation requirement from main power panels, switch gear and/or starter motors.

K. All power feeds crossing the path of the UTP cables at right angles must be a minimum of 6 inches in distance from the UTP cables.

L. Cables shall be run cable tray in corridors wherever possible in order to avoid furniture and work areas so that access to the cables is unencumbered.

M. The cables shall be placed at a minimum of 6 inches above the ceiling.

N. The cables are to be run so as to maximize accessibility. Contractor will notify the owner in the event this requirement cannot be met.

O. Debris, boxes, leftover cables, and trash must be removed from construction sites upon completion of work. No debris or work material may be left in areas that have student access unless the affected area is marked with cones, tape, or temporary fencing.

P. Contractor shall pull conductors together where more than one is being installed in a raceway. Cable bundles in raceways, in suspension systems, or on wallboards must be tie wrapped every 5 feet. There must be an independent system supporting the cable system. Cable bundles tied to the lighting-ceiling grid will not be permitted. Station wire cannot be attached to electrical conduit, gas or sprinkler piping, or other code-restricted items.

Q. No cabling is allowed to rest on any ceiling tile or suspension system. Cable shall be kept 30 inches away from any heat source; i.e., steam valves, etc.

R. Cables shall be pulled free of sharp bends or kinks, twists, or impact damage to the sheath.

S. Cables shall not be pulled across sharp edges. Cables shall not be forced or jammed between metal parts, assemblies, etc.

T. Cables shall not be pulled across access doors and pull box covers. Access to all equipment and systems must be maintained.

U. Cables shall be protected from paint and any other chemicals during installation. Any paint or chemicals that adhere to the installed cable shall be cleaned from the cable per manufacturers requirements. The cable manufacturer and the design consultant shall be notified.

V. Insulation shall be removed to expose shielding and conductors to the exact length required by manufacturer for proper termination of plugs and pins. Plugs and pins, upon termination, shall not be damaged in any way.

W. All communications racks must be properly anchored to walls and floors and grounded to building ground grid (not to water pipes, etc.).

X. Cable splicing will not be permitted in any horizontal cable run.

Y. Contractor shall install system using tools and equipment specifically designed for the installation tasks. Use installation practices that ensure the highest quality installation. Perform all cutting, splicing, pulling and termination of cables using equipment specifically designed for each purpose.

Z. Install tie wraps using a tension controlling cutting device. Tension shall not exceed that which is specified by the manufacturer of the cable. Tie wraps and other securing hardware shall be rated as required for the installation environment.

AA. Where multiple conduits are being used, fill one conduit to its maximum fill ratio before going onto the next conduit. Wherever possible, leave as many spare conduits available as possible.

BB. All cables requiring lubrication for installation in conduits shall be continuously lubricated during the pulling-in process. Maximum pulling tensions specified by the cable manufacturer shall not be exceeded. Monitor cable-pulling tension with a mechanical tension-indicator.

CC. All new conduit will not exceed a 40% fill rate. All spare conduits or conduits filled with less than the maximum allowed fill ratio shall have a pull string installed and left for future installation of cable. Clearly label as "pulling line" indicating To/From.

DD. Support cables running overhead that are not installed in raceways by bridle rings or J-Hooks spaced every 5 feet.

EE. Install the telecommunication cabling system as detailed in the contract drawings in the exact location and layout shown in the details.

FF. Openings around electrical raceway penetrations shall maintain the fire resistance rating required. See NEC 300-21.

GG. Label all cables at both ends. The label shall be permanent. Labels shall be typed (not handwritten) and individual number strips are unacceptable. An acceptable labeling product is a self-laminating cable marker, such as Brady #DAT-9-292-series. All cable labeling shall include numeric designation, source, destination, and cable type.

HH. All outlet plates shall be installed neatly and square with floor and walls.

II. Category 6A installations shall conform strictly with EIA/TIA 568B and TSB-40B to insure a quality system that meets the transmission rate criteria.

JJ. Install cable above fire-sprinkler systems and ensure that the cable does not attach to the system or any ancillary equipment or hardware. Install cable system and support hardware such that it does not obscure any valves, fire alarm conduit, boxes, or other control devices.

KK. Do not attach cables to ceiling grid or lighting fixture wires. Where support for cable is required, install appropriate carriers to support the cabling.

LL. Any cable damaged or exceeding recommended installation parameters during installation will be replaced by the contractor prior to final acceptance at no cost to the Owner.

3.03 SEPERATION OF DATA AND POWER CABLING

A. Design cable pathways to avoid potential sources of EMI. Avoid installing cable near sources of EMI (X-ray equipment, large motors/generators, electrical power cabling and transformers, Radio frequency (RF) sources and transmitters, lighting, copiers, etc.).

B. Provide the following minimum separation distances between pathways for copper communications cables and power wiring of 480 volts or less.
   1. Open or Nonmetal Communications Pathways:
      a. 12-inches from electric motors, fluorescent light fixtures, and unshielded power lines carrying up to 3 kVA.
      b. 36-inches from electrical equipment and unshielded power lines carrying more than 5 kVA.
      c. 48-inches from large electrical motors or transformers.
   2. Grounded Metal Conduit Communications Pathways:
      a. 2 1/2-inches from electrical equipment and unshielded power lines carrying up to 2 kVA.

b. 6-inches from electrical equipment and unshielded power lines carrying from 2 kVA to 5 kVA.
c. 12-inches from electrical equipment and unshielded power lines carrying more than 5 kVA.
d. 3-inches from power lines enclosed in a grounded metal conduit (or equivalent shielding) carrying from 2 kVA to 5 kVA.
e. 6-inches from power lines enclosed in a grounded metal conduit (or equivalent shielding) carrying more than 5 kVA.

C. Physically separate power & data cabling according to relevant code and standard requirements when run in a common pathway.
1. Never run data and Class 1 power cabling in parallel closer than 2".
2. Avoid crossing cables if possible. If necessary, always cross cables at 90 degrees.
3. Maintain a minimum of 5 in. separation between data cable and all ballast controlled lighting.

D. Minimum separation distances of telecommunications cabling from potential sources of EMI exceeding 5kVA:
1. 24" away from Unshielded power lines or electrical equipment in proximity to open or nonmetal pathways
2. 12" away from Unshielded power lines or electrical equipment in proximity to a grounded metal conduit pathway
3. 6" away from Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded metal conduit pathway
4. 48" away from Electrical motors and transformers

3.04 FURNITURE CABLING

A. The contractor will pull all data cables in advance of the installation of the modular furniture workstations, and coil at basefeed or above ceiling for power pole feeds. Upon furniture arrival, the contractor will feed the cables through power poles or base feed/wall connected data/telecom conduit, and terminate as specified on the floor plans.

B. Contractor to coordinate with Owner's furniture vendor for timing of the installation of systems furniture, and installation of electrical and voice/data cabling.

3.05 TERMINAL BLOCKS AND PATCH PANELS

A. Arrange all terminal blocks in a manner that allows natural wiring progression and minimizes crossing of wires.

B. Dress and comb all incoming cable bundles in groups of 24 cables each. Eliminate crossed cables and "divers".

3.06 TELECOMMUNICATION ROOMS

A. The Data and Telco Rooms are a transition point between the backbone and horizontal distribution pathways. The rooms shall be able to contain data or telecommunications' equipment, cable terminations and associated cross-connection wiring. Closet spaces are not to be shared with electrical installations, other than those directly for telecommunications, video, security and information systems equipment. The rooms are not to be shared with other unrelated building service, for example plumbing. Any conflicts with these specifications require the approval of the Owner's project manager.

B. Contractor shall submit a drawing of the Telco room showing layout of all components including necessary and required electrical outlets, conduits, environmental requirements and wire termination fields prior to start of the job. Any jack densities noted in these specifications are estimates only. The drawing will designate the most effective, scalable, jack termination cabling design to facilitate data/telecom outlets shown on the lease exhibits. Owner's Project Managers must approve drawings prior to installation.

C. All racks, panels, and equipment finished shall be anchored to meet local seismic zone requirements and industry standards. The equipment racks are to be anchored to the concrete

floors via “Unistrut or equal metal framing strut systems”, drop in anchors only for all floor mount racks, concrete anchors, bolts and washers.

D. The overhead cable ladder system will provide a route for the Category 6A, and other communication cables while providing stability to the equipment racks.

E. The vendor is responsible to provide and install the specified count of 19” EIA rack-mount 7’ (45U) 2- post racks, Black, as required in the new Telco Room. The vendor is responsible for submitting Telco room layout drawings to Owner for approval prior to installation.

F. The contractor shall provide high capacity horizontal and vertical cable manager channels are required in all data and equipment racks, and the racks will contain sufficient vertical and horizontal cable managers to facilitate the patch panel density and placement installed by the contractor.

G. Contractor will install raceways, boxes, managers, and enclosures as indicated according to manufacturer’s written instructions. Securely fasten each component to the surface to which it is mounted and remove burs and sharp edges from all cable tray.

H. A 12” ladder rack system is required and will be provided by the contractor and installed in the IDF to provide cable support to the rack system. This includes all of the required ladder rack support items such as rack to runway kits, wall angle brackets, ceiling supports, splices (junction and butt), radius drops and j-bolts. The final ladder rack layout will be included in the IDF layout drawing described above.

I. Provide and install as needed in the Telco room 4’ x 8” x 3/4” fire-rated plywood board and labeled with fire rating stamp facing into the room to accommodate rack ladder support, cabling support, grounding platform, data and voice equipment. Paint backboard white (leave stamp visible) to match existing backboard in room, if appropriate. Location of installation is to be determined with approval by Owner.

J. No more than four (4) data patch panels will be mounted to a 7’ equipment rack.

K. If you need more than four (4) data patch panels to complete the job contractor will need to install an additional 7’ rack.

L. Patch panels for special circuits (fax, T1,) can be mounted to a rack that already has four (4) data patch panels mounted in it.

3.07 UNSHIELDED TWISTED PAIR TERMINATION

A. Check plans and symbology for final determination of faceplate constitution or consult with Owner prior to bid.

B. Install additional cables at drop locations and in quantities indicated on the drawings.

C. Do not exceed manufacturers’ recommendations for maximum allowable pulling tension, side wall pressure or minimum bending radius. Use pulling compound as recommended by cabling manufacturer.

D. All horizontal cables, regardless of media type, shall not exceed 90 m (295 ft) from the telecommunications outlets in the work area to the horizontal cross connect.

E. The combined length of jumpers, or patch cords and equipment cables in the telecommunications room/closet and the work area shall not exceed 10m (33 ft.).

F. No run of UTP cable between horizontal portions of the cross-connect in the telecommunication closet and the information outlet shall contain splices.

G. In a false ceiling environment, a minimum of 3 inches (75 mm) shall be observed between the cable supports and the false ceiling. Minimum 6” is preferred.

H. J-hooks shall be provided for all suspended cable, at a semi-irregular spacing not to exceed 5 feet between supports. Cables shall be supported by dedicated low-voltage cable support hardware. Support of cables or hanging hardware by means of supports or surfaces related to other trades or applications is not allowed.

I. Provide a full-size service loop (at least once around the inside edge of the box) in each J-box in the communications system.

J. Install all cable in plenum spaces with J-hooks of at least 1" in width to disperse the weight on the bottom cables. Homerun all cable to nearest TR Cabinet.

K. Comply with ANSI/TIA-569 for conduit and splice box sizing.

L. Install modular jacks at all outlets shown; one data jack for each data cable at each faceplate or termination point. Install additional cables and modular jacks as indicated on the drawings. Do not "split pairs" between different jacks.

M. Terminate cables at each jack location and at termination board or patch panel. Follow industry guidelines and manufacturers' recommendations and procedures as required. All termination hardware shall be rated to exceed their associated Category rating as specified above.

N. Field-installable RJ45 plugs are not to be used.

O. For enclosed ceiling WAP locations, install and terminate CAT6A cables to approximate location as shown on plans. For open-ceiling environments, secure cables and surface-mount boxes to nearest appropriate support structure.

P. For in-ceiling WAP locations, secure jacks inside a surface-mount block mounted to in-ceiling metal assembly, and provide a 5' patch cord or longer, as needed, to connect device to its final determined location in ceiling.

Q. For wall-mounted device locations, utilize an in-wall bracket in lieu of faceplate as described above. Secure mounting bracket and device hardware directly over backbox. Connect device with 1' CAT6A cord (Security, AV, or WAP), or 1' high-flex CAT6 patch cord for other CAT6-based devices. Coil patch cord inside backbox.

R. Label and identify each outlet and cable for data circuits. Label at outlet end and at termination board or patch panel with matching designations.

S. Provide data outlets in surface raceway at 26" on center unless otherwise indicated.

T. Extreme care must be taken not to nick any of the copper conductors when removing jacket. Use rip cord to expose pairs for termination onto Insulation Displacement Contacts. You can also use a precision stripper that allows the technician to set the depth of the blade.

U. Maintain twists as close as possible to the point of termination. Untwisting of copper pairs should not exceed ¼" to the termination point.

V. Manage the cable bundles in a symmetrical orientation. For example, in a 48-port patch panel, distribute 24 cables through the vertical cable management on the left rear side of the rack and 24 cables through the vertical cable management on the right rear side of the rack.

W. Do not dress cables in bundles larger than 24 cables. Multiple 24-cable bundles may be run in parallel with evenly-spaced Velcro cable ties in an orderly sequence.

X. For cable management on rear of patch panel, cable shall sweep into termination points and be supported by appropriate rear cable management.

Y. Horizontal patch cord management is required on all installations which do not use angled patch panels.

Z. Maintain cable bend radius 4X outer diameter (UTP only) when mounting faceplate onto EMT backbox, box-eliminators or furniture knock-outs.

AA. Faceplates and SMBs shall be fully installed and labeled prior to testing.

BB. Loosely coil and store excess slack in the ceiling above each termination location when there is not enough space present to store slack cable.

CC. Install cable in accordance with manufacturer's recommendations and best industry practices.

DD. Dress and terminate cables in accordance with the recommendations made in the ANSI/TIA/EIA-568-C.1 document, manufacturer's recommendations and best industry practices.

EE. Terminate 4 pair cables on the jack and patch panels using T568B wiring scheme.

FF. Maintain the cable jacket within 1-inch of the termination point.

GG. Do not exceed 0.5-inch of pair untwist at the termination point.

HH. Do not exceed 4 times the outside diameter of the cable in the termination area for bend radiance compliance.

II. Neatly bundle and dress cables to their respective panels or blocks. Feed each panel or block by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame.

JJ. Horizontal station cabling must have no less than 10' service loop at station end and 5' at patch panel ends. These loops should be dressed in an orderly fashion above T-bar.

3.08 FIBER OPTIC CABLE SYSTEM

A. The fiber optic raceway system must be continuous between pull boxes and junction boxes. The raceway system must enter and be secured to enclosures.

B. All fiber supplied to the campus, must be tested with an OTDR, Microtest Certifiber, or equal prior to installation, while still on the shipping reel, using an optical time domain reflectometer (OTDR) or a 850/1300/1510 nm power meter and stabilized light source. The test results must be compared to the manufacturer's test results. A discrepancy of more than 1 dB on any fiber in either window indicates possible shipping damage and the fiber must be returned to the supplier.

C. All fiber must be tested after installation according to the procedures and acceptability criteria described in EIA/TIA 455A (Aug 1991) and all applicable addenda after installation and termination using an OTDR in one direction and an 850/1300 nm power meter and stabilized light source in both directions and in both optical windows. The results of these tests (printed OTDR results and tabular loss results) must be provided by the installer as documentation of the quality of installation and as a baseline for future troubleshooting. The results must be compared to the pre-installation test results for significant changes.

D. All optical test equipment must have current, traceable calibration certification.

E. All spare optical ports and connectors should have a dust cap in place to protect the cable from the environment.

F. Manufacturer's specification for pulling stress and minimum bend radius must not be exceeded on any fiber cable.

G. Installation contractor must develop and review conduit installation plan with the owner before beginning installation.

H. Installation contractor must verify all device locations with the owner before installation.

I. Installation contractor must review cable numbering and labeling scheme with the owner prior to installation.

J. Installation contractor must review drawing notes and drawing back-annotations (red line) on site plans with the owner prior to installation.

K. Fiber Optics Cable Labeling: Fiber termination locations must be labeled to corresponding fiber strand pairs at the Main Distribution Frame (MDF), and Intermediate Distribution Frame (IDF) Using embossed labels. The Contractor is expected to provide tags, straps, and adhesive labels. These tags, straps, and adhesive labels must be of high quality that will endure over time. Hand written labels are not acceptable.

L. All outside fiber cable will be installed through 1.25" innerduct from point of origin and destination.

M. Securely fasten the fiber optics raceway to the cable tray, or walls when routed inside buildings, using clamps and clips designed for this purpose.

N. Provide a nylon or polyethylene pulling line in all fiber optics raceways. Clearly label as "pulling line", indicating source and destination.

O. Openings around fiber optics raceway penetrations shall maintain the fire resistance rating required. See NEC 300-21.

P. All fiber optics cables are to be run as efficiently as possible, minimizing the amount of cable required.

Q. All fiber optics cables shall be continuously lubricated during the pulling-in process. The maximum pulling tensions specified by the cable manufacturers shall not be exceeded. Monitor cable pulling tension with a mechanical tension meter.

R. The fiber optics cables passing through pullboxes and manholes shall be neatly arranged and secured to cable jacks on the interior walls. Cables will not be accepted when diving through the manhole or pullbox.

S. As fiber optics cables emerge from intermediate-point pull boxes, coil the cable in a figure eight pattern with loops not less than two feet in diameter.

T. Label all fiber optic cables at both ends. The label shall be permanent. Labels shall be typed (not handwritten) and individual number strips are unacceptable. All cable labeling shall include numeric designation, source, destination, and cable type.

U. Fiber optics raceways shall be clearly marked at each pull box indicating type and number of cables within.

V. If connectors have been factory installed on fiber optic cables, protect the connector during the pulling-in by wrapping with a thin layer of foam and insert in a stiff plastic sleeve for protection.

3.09 GROUNDING

A. All grounding (earthing) and bonding shall be done to applicable codes, standards and regulations.

B. Grounding shall be accomplished by common single-point termination of all ground conductors.

C. All metallic components of the infrastructure system shall be solidly grounded by the shortest possible route.

D. Manhole Splices and Splice Cases - the Contractor will connect the splice case to the manhole ground as per GTE practice 605-100-201 using a #6 AWG solid copper wire.

E. NEMA Enclosure splices and Splice Cases - the splice case must be grounded to the provided ground lug in the existing NEMA box with a minimum #6 AWG wire.

F. MDF/IDF Splices and Splice Cases - the splice case must be grounded to the provided ground bar in the Voice/Data Equipment Room with a minimum #6 AWG wire.

G. MDF/IDF Electrical Protection Splices - the Contractor must bond the cable's metallic sheath/shield to the metallic splice case with the bonding bar assembly provided with the splice case.

H. Labeling: The splice case and all cables must be labeled using a stamped metal plate or indelible plastic plate, that the owner has approved, which details exact pair counts and destinations. Each 25-pair binder group, of each cable entering the splice case, must be labeled with a Panduit PAN-TY PLF1M-0 Flag with appropriate cable pair counts.

I. Conduit Sealing: The Contractor will supply and install all necessary components to effectively seal all conduits. The Contractor will use Semco part #PR-851 conduit sealing kit. The PR-851 compound is a two-part polyurethane foam, which, when mixed for fifteen seconds, expands approximately fifteen times in volume. It forms a dense, tough foam with a density of three to four pounds per cubic foot. The expanding nature of the compound allows it to fill cracks and voids in conduit walls, and imperfections in the cable sheath. This effectively seals the conduit against the passages of gases and water. For additional information, refer to GTE Practice 628-020-203.

J. Shielded cabling channels shall include appropriate method of bonding shield to approved ground for proper EMI/RFI mitigation.

K. Shield Continuity Testing shall be Enabled when shielded cabling channels are installed.

L. All shielded and armored cables shall be bonded to a telecom grounding system via shielded patch panels at the rack locations. Shielded Category-rated connectors must be properly installed to maintain electrical ground conductivity along entire length of cable and at both ends of the cable. UTP connectors shall not be used on shielded cables at either end.

M. Shielded Patch cords shall be provided for use and employed at each workstation location utilizing shielded cable. Shielded patch cords can be identified by their gray color and metallic RJ45 plug.

N. Telecom Contractor shall bond and ground all telecom room metals. Telecom Contractor shall provide and install TIA-rated Telecommunications Grounding Busbar (TGB) at all Telcom Room locations, and an in-cabinet grounding busbar at each remote wall-mounted cabinet or telecom enclosure. All ground lugs shall be 2-hole make-up and be compression style. Screw lug type will not be accepted.

O. Electrician will provide connection between TGB and building ground; Telecom contractor (if separate, otherwise electrician) will provide a busbar and ground all equipment and telecom metals to the busbar.

P. Telecom installer will ground and bond all armored and/or shielded cables, racks, cabinets, cable tray, ladder racking, and shielded panels to telecom grounding busbar.

3.10 WIRELESS ACCESS DEVICE INSTALLATIONS

A. Above-ceiling and wall-mounted wireless access points and devices.
   1. All WAP locations shall receive (2) Category 6A cables from the nearest TE or TR (IDF). Multimedia, security and other video devices shall receive CAT6A cables as shown on drawings, documents and details.
   2. Clock/Speakers and other low-bandwidth mounted devices shall receive (1) CAT6A cable.
   3. WAP, IP Camera and other communications cables shall terminate on patch panels in the TE/TR (IDF).
   4. WAP cables shall terminate on Category 6A information outlets and shall be supported by an in-ceiling termination bracket. Affixing of a 2-port SMB to the bracket is recommended.
   5. SMB, jacks, and patch cords used in plenum spaces shall be plenum-rated.
   6. SMB shall be mounted in the ceiling on a specially-designed clip attached to a cable support ceiling wire or threaded rod support per cable management section in Part 2. SMB shall not be tie wrapped to supports, or left on ceiling tiles or other equipment located above the ceiling.
   7. Wall-mounted devices not requiring faceplates will be mounted directly to the backbox. Jacks will be secured inside backbox on a specially-designed in-wall bracket clip per cable management section in Part 2.
   8. Contractor shall mount Access Point (AP) electronics to the drop-ceiling suspended T-grid system. (AP and mounting hardware provided by Owner). Contractor to provide and install (2) white Cat 6A patch cords from the overhead WAP outlets to the AP. Contractor shall neatly cut holes into the ceiling tile and finish the holes with grommets or other industry-standard finishing piece for a professional look.

3.11 PATHWAYS AND TOPOLOGY

A. Utilize “thin film” lubricants only! It has been shown that cable-pilling lubricants will affect your testing as the cable needs several weeks to dry before attenuation levels recover. Use of incorrect cable lubricants will erode cable jacket and void cable warranty.

B. All cable and wire shall be concealed in conduits, floor ducts, paneling, ceiling or similar areas except at mutually agreed upon areas.

C. Fill capacity in conduit, modular furniture and other horizontal pathways should not exceed 40%. A maximum of 60 % pathway fill is allowed to accommodate unplanned additions after initial installation. The Cat 6A cable is a larger O.D. 0.250. The increased diameter of Cat 6A cable will require appropriate design considerations when sizing conduit and other pathways. In most installations, conduit sizes will have to be increased in order to accommodate all of the cables being installed. This will impact the design and material selection of the project. To

calculate the fill ratio, divide the sum of the cross-sectional area of all cables, by the most restricted cross-sectional area of the pathway.

D. Fill ratios for Augmented CAT6 cable (CAT6A) requires 1" EMT for 4 cables and sized larger for additional cables as required to maintain a 60% fill ratio.

E. Flat-rung and/or solid bottom cable tray shall be utilized for large, high-density installations. J-hooks and other specific cable support hardware shall be used at all locations outside of cable tray.

F. Pathway design should not exceed (2) 90-degree bends between pull points or pull boxes (PB). If more than (2) 90-degree bends are required, install a pull box between bends.

G. Provide NEC-sized pull boxes for any run greater than 100 feet, or with more than two ninety-degree bends.

H. J-hooks should be randomly spaced 60" or less. Do not exceed J-hook capacity for size and weight limitations.

I. Land wireless access cabling above ceiling, secured onto in-ceiling bracket. Utilize varying-length patch cords when installing wireless access point devices for flexibility in length.

J. Crimp-on plugs at wireless access points are not allowed. Terminate all WAP cabling onto jacks and ceiling-mount brackets and test all cables as appropriate.

K. Mixing of various Category cables in the same pathway is allowed as long as the applications are appropriate for each category of cable used.

L. Prior to placing any cable pathways or cable, the contractor shall survey the site to determine job conditions will not impose any obstructions that would interfere with the safe and satisfactory placement of the cables. The arrangements to remove any obstructions with the Project Manager need to be determined at that time.

M. Maintain a distance of at least 12 inches from all power conduits and cables, and 6 inches from all fluorescent lighting fixtures. Do not install power feeders 100 amps or greater above or within 5 feet of telecommunications backboard. Do not install telecommunications conduits above power panels or switchboards.

N. Cable shall be installed above fire-sprinkler systems and shall not be attached to the system or any ancillary equipment or hardware. The cable system and support hardware shall be installed so that it does not obscure any valves, fire alarm conduit, boxes, or other control devices.

O. The backbone subsystem shall include cable installed in a vertical manner between floor telecommunications room/closets (TCs or IDFs) and the main or intermediate cross-connect in a multi-story building and cable installed horizontally between telecommunications room/closets and the main or intermediate cross-connect in a long single story building.

P. Unless otherwise recommended by the Owner, all fiber cables will be encased in interlocking armor. All fibers will be terminated in the Telecom Rooms or Cabinets in rack-mounted enclosures equipped with sufficient ports to allow for growth, slack storage space and splice trays if required to terminate and secure all fibers.

Q. Adequate riser sleeve/slot space shall be available with the ability to ingress the area at a later date in all Telecommunications rooms/closets, such that no drilling of additional sleeves/slots is necessary. Sleeves may need to be provided and installed under the scope of this Project.

R. The backbone cables shall be installed in a star topology, emanating from the main cross-connect to each telecommunications room/closet. An intermediate cross-connect may be present between the main cross-connect and the horizontal cross-connect.

S. For voice or data applications, 4 pair UTP or fiber optic cables shall be run using a star topology from the telecommunications room/closet serving that floor to every individual information outlet.

T. Backbone and Horizontal pathways shall be installed or selected such that the minimum bend radius is maintained both during and after installation.

U. All horizontal pathways shall be designed, installed and grounded to meet applicable local and national building and electrical codes.

V. Install ¾" x 4' x 8' fire-rated plywood across all walls in telecom rooms, from 6" AFF to 8'-6" AFF. Coat with 2 coats of white paint. Do not paint over fire rating stamp.

W. Contractor shall firestop all used pathways which enter or leave the telecom rooms via conduit, cable tray or slot. Contractor is responsible for installing sleeves at each wall or partition penetration, and firestopping all fire-rated penetrations. Intumescent caulk shall be applied around the outside of each sleeve, and intumescent putty inside the sleeve or conduits around the cables. Appropriate fill ratios must be followed when penetrating fire-rated walls.

X. Do not run fiber cables in conduits which are less than 2" in diameter.

Y. Abandoned cable shall be removed from pathways (i.e., from tunnels, manholes, plenum spaces, and conduit) under scope of this project. Previously unknown or unidentified cable which is apparently abandoned prior to work shall be brought to the attention of the Owner for authorization prior to removal.

3.12 SYSTEM TESTING

A. The Contractor shall be responsible for separately testing and documenting the cables and termination throughout the entire cabling system. Ensure that the cable and equipment being installed in the system is without flaw and that no potential damage to the cable or equipment occurred in shipment, handling, or installation. The owner representative shall observe the testing of the installed cabling and terminations at any time during the testing process.

B. Test cables and termination hardware for defects in installation and to verify cabling system performance under installed conditions according to the requirements of ANSI/TIA/EIA-568-C. Verify pairs of each installed cable prior to system acceptance. Repair or replace any defect in the cabling system installation including but not limited to cable, connectors, feed through couplers, patch panels, and connector blocks in order to ensure 100 percent useable conductors in cables installed.

C. Testing of all installed unshielded twisted pair telecommunications cabling shall be performed by the Contractor. Interim testing of the cabling system during and after installation is encouraged to ensure that the testing and acceptance criteria are met.

D. Acceptance of the Telecommunications Cabling System shall be based on the quality of Contractor performance by analysis/inspection of the testing program documentation and the conformance of the system operation with the criteria described herein. Contractor shall make available all drawings and documentation prior to acceptance testing.

E. Contractor shall provide all necessary testing equipment for performing the required acceptance test. Contractor shall verify the authenticity and display appropriate calibration data to include the expiration date of the correct calibration.

F. Testing methods are provided herein as reference for the Contractor. Test equipment, methods, and criteria shall comply with the guidelines set forth in TIA TSB - 67 - Transmission Performance Specifications for Field Testing of Unshielded Twisted Pair Cabling Systems where applicable.

G. Copper Cable Testing:
   1. TEST TWISTED-PAIR copper cable links for continuity, pair reversals, shorts, opens and performance as indicated below. Additional testing is required to verify Category performance. Test cabling using a Level IV test unit for Category 6 performance compliance as specified in ANSI/TIA/EIA-568-C.
   2. CONTINUITY - Test each pair of each installed cable using a test unit that shows opens, shorts, polarity and pair-reversals, crossed pairs and split pairs. Test shielded/screened cables with a device that verifies shield continuity in addition to the above stated tests. Record the test as pass/fail as indicated by the test unit in accordance with the manufacturers' recommended procedures, and referenced to the appropriate cable identification number and circuit or pair number. Correct or repair any faults in the wiring and re-test the cable prior to final acceptance.

3. LENGTH - Test each installed cable link for installed length using a TDR type device. Test the cables from patch panel to patch panel, block to block, patch panel to outlet or block to outlet as appropriate. The cable length will conform to the maximum distances set forth in the ANSI/TIA/EIA-568-C standard. Record cable lengths, referencing the cable identification number and circuit or pair number. For multi-pair cables, record the shortest pair length as the length for the cable.
4. Test all equipment and each outlet, horizontal cable, termination block, patch cords, etc. to verify compliance with requirements. Testing shall consist of attenuation and NEXT across all splices and devices installed in the field and shall meet latest requirements of EIA/TIA. Re-terminate any cable or connection found to be defective.

H. Provide test results in electronic format, with the following minimum information per cable Tester is to be a Level IV device or better, and configured with the specific cable installed, and the Permanent Link test will be performed according to the Category's standard methodology.
1. All parameters must exhibit a PASS test result prior to project completion. PASS*, FAIL* or FAIL test results will not be accepted. Test Results for PASS test shall include the following:
   a. Project Name
   b. Date and Time of test (daily recording)
   c. Circuit I.D. number with corresponding jack identifier
   d. Applicable room number of jack location (per contract documents)
   e. Applicable telecommunications room number
   f. Test result, "Pass" or "Fail"
   g. Wire Map – shall include the following:
      1) Continuity to the remote end
      2) Shorts between any two or more conductors
      3) Crossed pairs
      4) Reversed pairs
      5) Split pairs
      6) Any other mis-wiring
   h. Length
   i. Insertion Loss
   j. Near-end Crosstalk (NEXT) Loss
   k. PS-NEXT (Power Sum Near End Cross Talk)
   l. FEXT (Far End Crosstalk)
   m. ELFEXT (Equal Level Far End Cross Talk)
   n. PS-ELFEXT (Power Sum Equal Level Far End Cross Talk)
   o. Propagation Delay
   p. Delay Skew
   q. Return loss
   r. PSFEXT (Power Sum Far End Crosstalk)

I. Category 6A
1. Only a permanent link test for Category 6A will be required.
2. All systems must pass Category 6A specifications and be accepted by the owner before the work will be considered complete.
3. Inter- and Intra-building tie cables: all tie cables will be tested for pass-fail connectivity ground continuity.
   a. Testing of Category 6A cable shall meet TIA 568A Requirements.
   b. The vendor must utilize a check-off list for reference by the owner during tests.
   c. The result of the measurements outlined shall be recorded and submitted to the owner as final proof of system performance. Electronic results will be supplied in Fluke or equivalent format. If the owner requires specific software to view the results, the contractor will supply a copy of software to the owner.
4. Test Results for CAT6A shall include all of the above (3.12, H), plus the following:
   a. AACRF (Alien Attenuation to Crosstalk Ratio, Far End)
   b. AFEXT (Alien Far End Crosstalk)

c. ANEXT (Alien Near End Crosstalk)
d. PSANEXT (Power Sum Alien Near End Crosstalk)
e. PSAACRF (Power Sum Alien Attenuation to Crosstalk Ratio, Far End)

5. Approved Tester Products:
   a. Softing WireXpert series tester
   b. Fluke DTX or later platform Cable Certification testers
   c. Linkware Record Management Software

J. Fiber Test Documentation:
1. Provide electronic CD disk and hard copy test reports from ANSI/TIA/EIA-526-14A Method B Standards. Calculate a "Loss Budget" for each cable length based on cable length and connectors. Provide as a minimum, OTDR test results in the form of a printed waveform and text table for both 850 nm and 1300 nm for multimode fiber and 1350 nm and 1510 nm for singlemode fiber. Test fibers and connector systems for end-to-end attenuation. Provide a power meter test on fiber optic strands at both wavelengths A to B, B to A and OSPL (OSPL is as defined as La + Lb). Include the results of unsatisfactory tests, with an explanation of how the problem was corrected. Clearly label connector and fiber loss on test waveforms.
2. Each pre-terminated fiber strand shall be tested for continuity and attenuation with an Optical Power Meter and light source for actual length and splice/connector loss. Each field-terminated fiber strand (if any) shall be tested for attenuation with an Optical Power Meter and light source and with an Optical Time Domain Reflectometer (OTDR) for actual length and splice/connector loss.
3. Cable length shall be verified using sheath markings. The guidelines and procedures established for Tier 1 testing in TIA/TSB-140 shall apply.
4. All fiber optic cables shall be tested from the site's MDF to each fiber terminals located in the IDF.
5. The Contractor shall conduct a bi-directional power meter (loss) test of each fiber optic station and riser cable at both wavelengths, 850/1300nm for MM and 1310/1550nm for SM.
6. No individual station or riser fiber link segment (including connectors) shall measure more than 2.0 dB loss for LC, and 1.5dB loss for MTP. LC links shall be tested with LC jumpers to the tester. MTP links shall be tested either with an MTP tester and array cord, or with an MTP-LC breakout harness and LC duplex fiber tester.
7. Tests shall be conducted using ANSI/TIA-526-14A, Method B. Test results evaluation for the panel to panel (backbone) shall be based on the values set forth in ANSI/TIA-568.
8. The Contractor shall provide an electronic printout for each strand tested with the Power Meter and the OTDR.
9. Where concatenated links are installed to complete a circuit between devices, the Contractor shall test each link from end to end to ensure the performance of the system. After the link performance test has been successfully completed, each link shall be concatenated and tested. The test method shall be the same used for the test described above. The evaluation criteria shall be established between the Owner and the Contractor prior to the start of the test.
10. The contractor shall perform all tests and adjustments, and shall furnish all test equipment necessary and perform all work required to determine or modify performance of the system in accordance with these specifications. The contractor will submit to the owner a complete test plan for Station Wiring/Information outlet (Voice, Data and Network), and Riser Cable to be used for this contract. At a minimum, the plan should show test configurations, calibration procedures, impedances, and measurement equipment. This plan must be approved by the owner prior to the start of testing. The test plan is a one-time requirement and will remain in effect for the duration of this contract unless specifications change requiring a re-submittal. The scope of this work includes, but is not limited to, the following:
    a. Test all fiber with an OTDR, Microtest Certifiber or equal, prior to installation while fiber

is still on the shipping reel, using an optical time domain reflectometer (OTDR) or a 850/1300/1510 nm power meter and stabilized light source. Compare test results to the manufacturer's tests. A discrepancy of more than 1 dB on any fiber in either window indicates possible shipping damage and the fiber must be returned to the supplier. Contractor shall keep test results on file for future reference.

b. Test all fiber after installation according to procedures and criteria described in TIA 455A and all applicable addenda after installation and termination using an OTDR in one direction and an 850/1300/1510nm power meter and stabilized light source in both directions and in both optical windows.
c. All optical test equipment must have current, traceable calibration certification.

3.13 DELIVERABLES

A. Operating and maintenance manuals shall be submitted prior to testing of the system. A total of (4) manuals shall be delivered to the Owner. Manuals shall include all service, installation, and programming information.

B. Four (4) copies of the general Copper, Category 6A, and Fiber ODTR results shall be submitted in a tabular, typewritten format at the completion of system testing. The test results must also be provided in an electronic file for future reference.

C. Cable test results shall be submitted in hard copy and magnetic format along with viewing software from the tester manufacturer. Hard copy to be bound within loose leaf binder and organized by serving MDF or IDF, room number of outlet location, and station identifier.

D. Contractor to provide all warranty information to APPROVED MANUFACTUER for processing. MANUFACTURE will send warranty document direct to Owner.

3.14 RECORD DRAWINGS

A. All drawings shall be submitted in hard copy with all field changes and contractor labeling indicated in red line updates. Upon completion of the project, Contractor shall deliver to Owner documentation of the project to include.

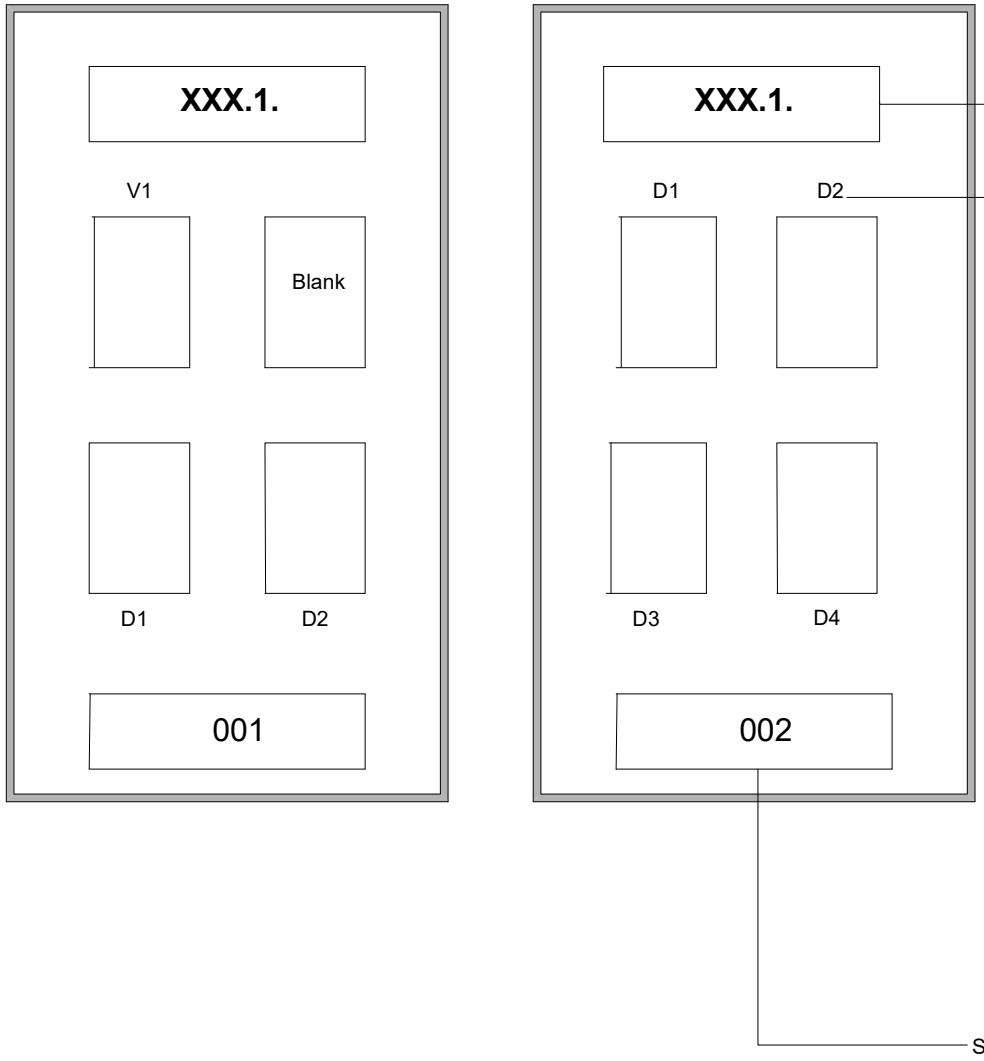
B. As-built telecommunications floor plans of the facility with cable, outlet placement and full labels clearly depicted.

C. As-built elevations of all termination fields describing cable and outlet location labeling scheme, and any changes to the wall elevations and conduit placements in the IT rooms will be recorded on as-built drawings

D. As-built logical riser diagram describing connectivity and cable sizes, for copper, fiber and grounding cabling systems. Diagram shall include as-built labeling of all OSP and rise cables.

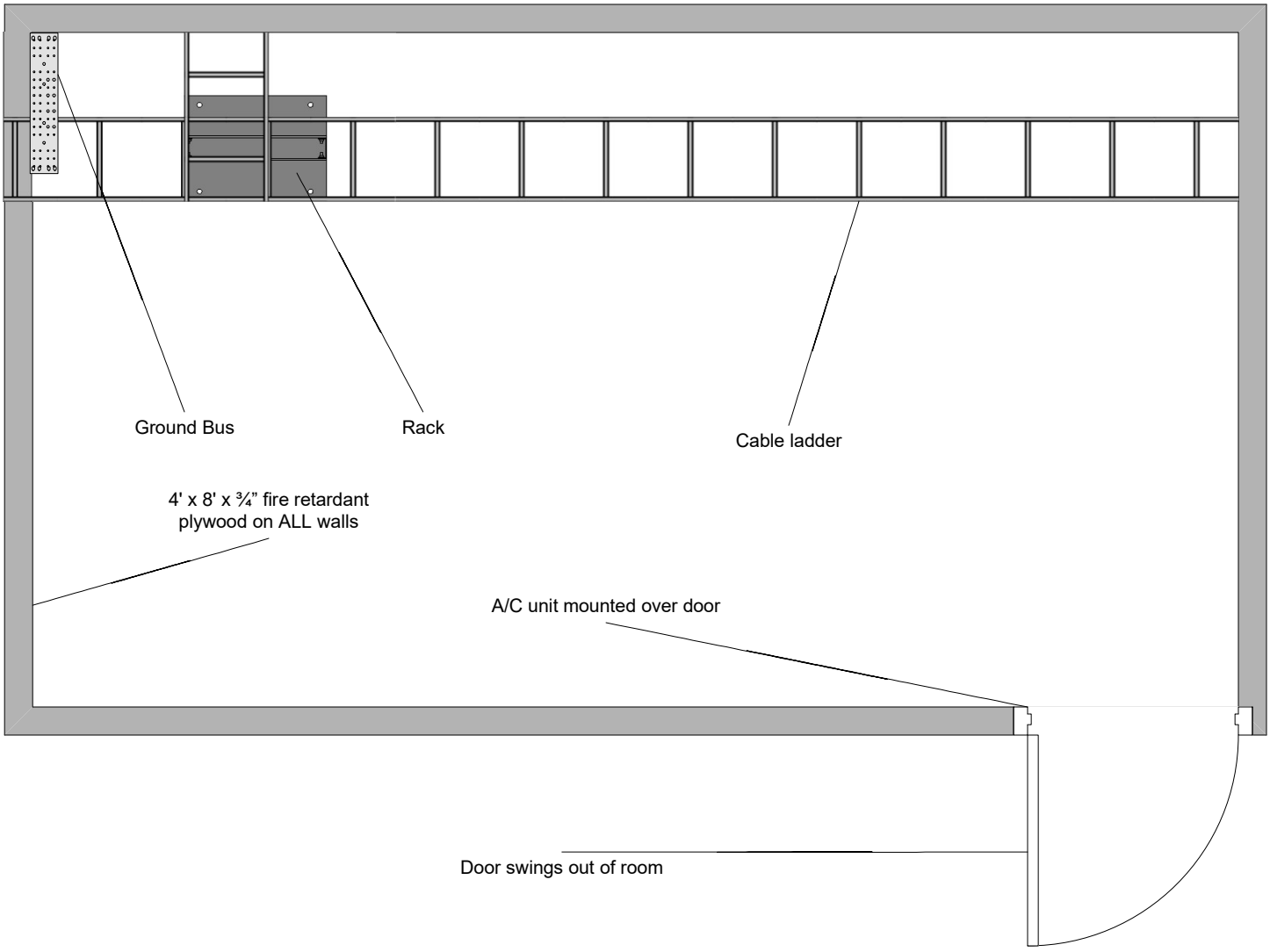
E. Provide a full set of "as-built" (redline) drawings in AutoCAD DWG and PDF format. Drawings to depict final location and drop/cable identification numbers and labels which match the test reports. Include (1) hard copy paper format of all as-builts in a laminated 30"x42" size or equivalent, posted in each telecom room involved in the project.

END OF SECTION



Typical Labeling Scheme For Work Station Outlets

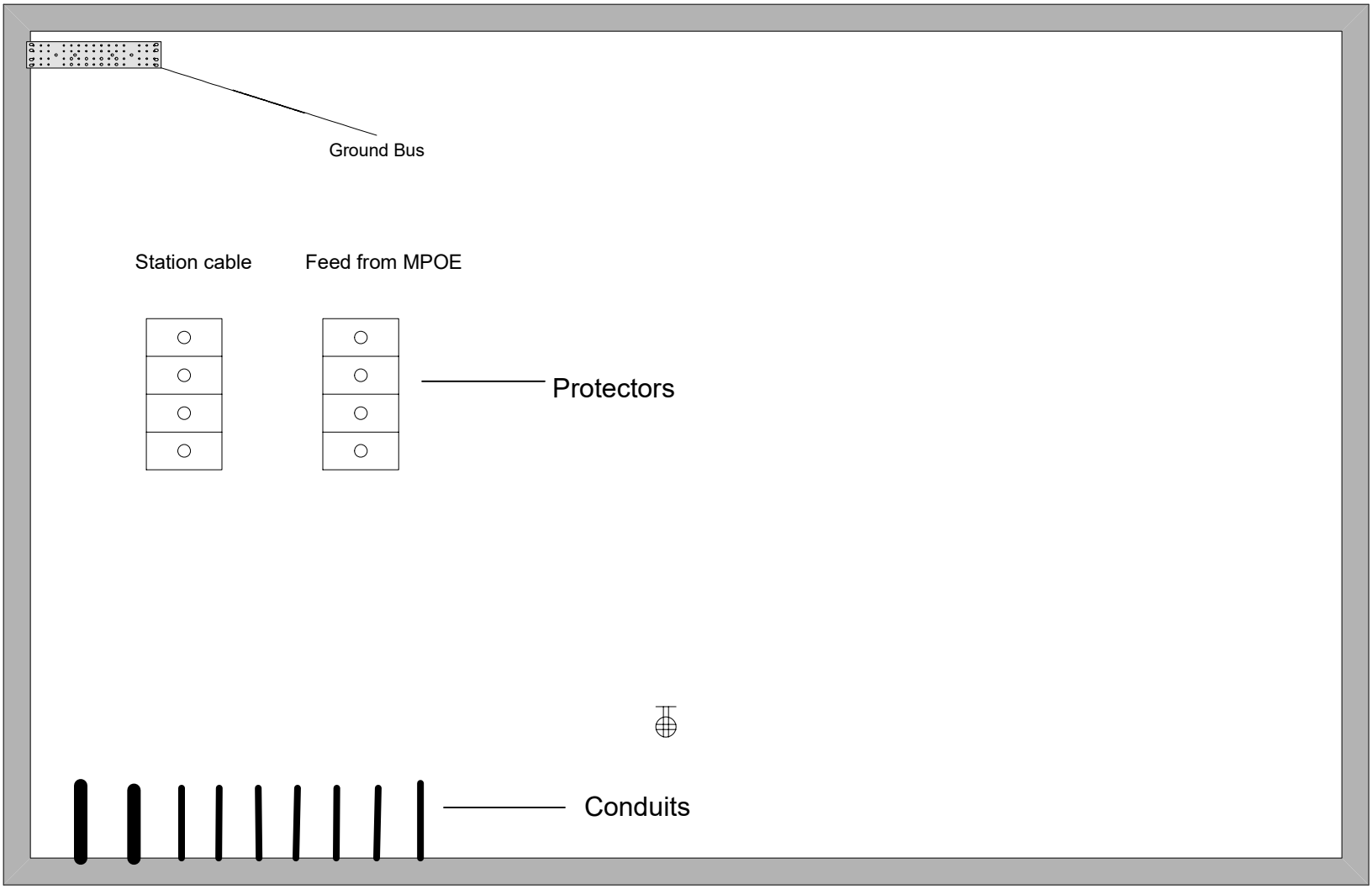
Overhead view of IT Room



- Cable ladder information. Chatsworth p/n 11275-712, or approved equal. 12" wide, with side bars 1" to 2" high. Provide all hardware, two hole compression style grounding lugs, two hole compression style grounding straps, fasteners, and ladder mounting brackets.

- Ground bus information: Chatsworth p/n 40153-020 or Approved equal. U.L. listed, predrilled, electrotin plated copper busbar with holes for standard sized 2 hole compression style lugs mounted on 2-inch insulators. 4 inches wide x ¼ inch thick x 20 inches long.

Elevation of wall of IT Closet



- Building Entrance Protectors Product Description: U1 197 Listed for Primary Protection. 25-pair, 50-pair (as required) with Stub or 110 in and 110 out, i.e., Circa 1880B1-25 or -100 or approved equal. Provide and install 3B1E Protector Modules.

- Ground bus information: Chatsworth p/n 40153-020 or Approved equal. U.L. listed, predrilled, electrotin plated copper busbar with holes for standard sized 2 hole compression style lugs mounted on 2-inch insulators. 4 inches wide x ¼ inch thick x 20 inches long.

Typical layout. Confirm with County Telecom before installation.