

BOARD OF SUPERVISORS
Yolo County, California

To: GSD ✓
Fin. Svcs. ✓

CONSENT CALENDAR

Excerpt of Minute Order No. 21-103, Item No. 14, of the Board of Supervisors' meeting of July 27, 2021.

MOTION: Sandy. SECOND: Villegas. AYES: Barajas, Villegas, Saylor, Sandy, Provenza.

14.

Authorize the Director of General Services to execute an agreement with Broward Builders, Inc. in the amount of \$3,575,000 for the construction of the Yolo Branch Library and authorize the Director of General Services to amend the construction contract with Broward Builders, Inc. up to an additional \$203,750 should amendments be required by the scope of the project. (General fund impact \$413,455) (Yarris)

Approved **Agreement No. 21-170** on Consent.



County of Yolo

www.yolocounty.org

To: The Chair and Members of the Board of Supervisors

Consent-General Government 14.

General Services

Board of Supervisors

Meeting Date: 07/27/2021

Brief Title: Approve construction agreement for the Yolo Branch Library

From: Kevin Yarris, Director, General Services Department

Staff Contact: Mike Martinez, Manager, General Services Department, x5015

Subject

Authorize the Director of General Services to execute an agreement with Broward Builders, Inc. in the amount of \$3,575,000 for the construction of the Yolo Branch Library and authorize the Director of General Services to amend the construction contract with Broward Builders, Inc. up to an additional \$203,750 should amendments be required by the scope of the project. (General fund impact \$413,455) (Yarris)

Recommended Action

- A. Award Contract to Broward Builders Inc. in the amount of \$3,575,000 for the construction of the Yolo Branch Library;
- B. Approve delegation of authority to the Director of General Services to negotiate and execute a contract with Broward Builders, Inc.; and
- C. Authorize the Director of General Services to issue Change Orders, as necessary, up to \$203,750 consistent with Public Contract Code section 20142.

Strategic Plan Goal(s)



Thriving Residents

Reason for Recommended Action/Background

On December 15, 2020, the Board approved the Yolo Branch Library Project budget and design.

The project will construct a new library now that the old library has been demolished. The new facility will upgrade and improve existing Yolo Branch Library services such as expanding the existing book and media collections in both English and Spanish languages, expanding public use computer stations, creating study rooms and distinct user group areas for children/family, teens and adults, expanding staff workspace areas, offering a covered outdoor activity area, possible outdoor gardens, seating, picnic areas and activity lawn and providing a dedicated meeting room for joint use by library programs and the community.

The project has been split into two separate phases with phase one beginning and ending before phase two begins. Phase one included salvage and demolishing the existing condemned Yolo Branch Library in

the first quarter of 2021. Phase two will construct a new 3,800 square foot Library Building.

The overall project budget summary is below.

Remaining Funding Source Components			
Funding Source	Previous Funding	New Funding	Total Funding
Capital Improvement Reserve (General Fund)	\$ 289,800	\$ 123,655	\$ 413,455
Accumulated Capital Outlay	\$ 551,987	\$ 884,558	\$ 1,436,545
Library Operating Fund		\$ 600,000	\$ 600,000
Friends of the Library Fundraising		\$ 150,000	\$ 150,000
Development Impact Fee - Library	\$ 300,000	\$ 1,000,000	\$ 1,300,000
Total Identified Funding	\$ 1,141,787	\$ 2,758,213	\$ 3,900,000
Budget			\$ 4,900,000
GAP to be funded through donations			(\$1,000,000)

If the donation funding target is not met, the County would provide gap funding from one or more of the following funds:

- CIP Reserve
- 2017 CIP Bond Issuance
- Accumulated Capital Outlay Fund
- Additional Development Impact Fee funds

Staff will bring back information later in the fiscal year on the strategy to close the funding gap once additional information is known.

Collaborations (including Board advisory groups and external partner agencies)

The County Administrator's Office collaborated with the Yolo County Library, Friends of the Library, County Counsel, General Services, County Department of Finance.

Competitive Bid Process

On May 12, 2021, the County issued an Invitation for Bids. The County received three bids by the closing date of June 29, 2021. The table below lists the bids received and the County's Engineer's estimate:

Bidder	Bid Amount
Engineer's Estimate	\$3,400,000.00
Broward Builders, Inc.	\$3,575,000.00
Roebbelen Contracting, Inc.	\$3,895,000.00
Arntz Builders, Inc.	\$4,193,000.00

The County determined that Broward Builders, Inc., to be the lowest responsive and responsible bidder based on the bids received and should therefore be awarded the contract.

Attachments

Att. A. Yolo Branch Library Contract

Form Review

Inbox

Reviewed By

Date

Kevin Yarris	Tonia Murphy	02/23/2021 03:49 PM
Kevin Yarris	Tonia Murphy	03/23/2021 09:54 AM
Kevin Yarris	Kevin Yarris	07/15/2021 01:58 PM
Kevin Yarris	Kevin Yarris	07/19/2021 04:20 PM
Financial Services	Chad Rinde	07/20/2021 04:25 PM
County Counsel	Phil Pogledich	07/21/2021 08:21 AM
Alexander Tengolics	Alexander Tengolics	07/21/2021 11:55 AM
Form Started By: Tonia Murphy		Started On: 01/26/2021 03:29 PM
Final Approval Date: 07/21/2021		

FILED

SECTION 00 52 00

COUNTY OF YOLO, CALIFORNIA

AUG 17 2021

BY *Julie Rackett*
DEPUTY CLERK OF THE BOARD

CONSTRUCTION AGREEMENT FOR THE YOLO BRANCH LIBRARY

37750 Sacramento Street, Yolo, California

CONTRACT NO. 21-170

This Agreement for Construction ("Agreement") is entered into as of the Effective Date 8/5/2021, as defined herein, between Broward 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 Branch Library, 37750 Sacramento Street, Yolo, California**, in accordance with the plans and specifications included within the Contract Documents, as defined in Section 2, below. Contractor shall complete Yolo County Library Project per bid amount not to exceed \$3,575,0000.

2. CONTRACT DOCUMENTS. The 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 above-referenced project. The documents that describe the work to be performed are sometimes collectively referred to herein as the Plans and Specifications. In the event of any conflict between any of the provisions of the Contract Documents, the provision that requires the highest level of performance from Contractor for the County's benefit shall prevail. The Contract Documents include:

- Exhibit A ~ Proposal Response, including all required forms
- Exhibit B ~ Subcontractor List
- Exhibit C ~ Technical Specifications and Drawings
- Exhibit D ~ Performance Bond and Payment Bond
- Exhibit E ~ General Provisions, General Conditions, General Requirements and Notice
- Exhibit F ~ Project Plans
- Exhibit F ~ Addendas
- Exhibit G ~ Change Order Form

3. CONDUCT OF WORK; CONTRACT ADMINISTRATOR. Contractor shall perform the services described in the Contract Documents 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 Manager of Facilities, Services and Capital Programs 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) days after receiving the Contract Administrator's Notice to Proceed and shall complete the work within **360 calendar days** after receiving that notice. This work must be complete, operational, have a Temporary Occupancy

Permit and be turned over to the County for its intended use for this milestone to be deemed complete. County understands the nature of delays and will allow for delays to the project, if applicable, pursuant to Section 3.08 of the General Conditions.

(b) **Liquidated Damages.** Contractor shall pay County **\$2,500.00** 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.

4. **INDEMNIFICATION.** Contractor's indemnity, defense, and related obligations shall be as specified in Section 00 62 10 of the Project Manual.

5. **COMPENSATION.** All matters of compensation shall be governed by the General Conditions, including but not limited to Article 25 thereof.

6. **INSURANCE.** Contractor shall maintain the following insurance while performing the services 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 insurance 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. 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. The General Contractor/**and or 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 General Contractor/**and or 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. 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).

(a) Special Terms and Conditions for Federal Funded Contracts

1. Equal Employment Opportunity

- a) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:
 - i. Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- b) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

- c) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- d) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- e) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- f) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- g) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- h) The contractor will include the portion of the sentence immediately preceding paragraph (a) and the provisions of paragraphs (a) through (h) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States. The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work:

Provided, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract. The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance. The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

2. Compliance with the Davis-Bacon Act

- a) All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable. The contractor shall comply with 40 U.S.C. 3141-3144, and 3146-3148 and the requirements of 29 C.F.R. pt. 5 as applicable.
- b) Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.
- c) Additionally, contractors are required to pay wages not less than once a week.

3. Compliance with the Copeland Anti-Kickback Act

- a) Contractor. The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.
- b) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.

- c) Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

4. Compliance with the Contract Work Hours and Safety Standards Act

- a) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- b) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.
- c) Withholding for unpaid wages and liquidated damages. The United States Department of Treasury or the County of Yolo shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
- d) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

5. Clean Air Act:

- a) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 USC §7401 et. Seq.
- b) The Contractor agrees to report each violation to the County and understands and agrees that the County will, in turn, report each violation as required to assure notification to the

United States Department of the Treasury, and the appropriate Environmental Protection Agency Regional Office.

- c) The Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by United States Department of the Treasury.

6. Federal Water Pollution Control Act:

- a) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 USC §1251 et. Seq.
- b) The Contractor agrees to report each violation to the County and understands and agrees that the County will, in turn, report each violation as required to assure notification to the United States Department of the Treasury and the appropriate Environmental Protection Agency Regional Office.
- c) The Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by United States Department of the Treasury.

7. Procurement of Recovered Materials:

- a) In performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired –
 - i. Competitively within a timeframe providing for compliance with the contract performance schedule;
 - ii. Meeting contract performance requirements; or
 - iii. At a reasonable price.
- b) Information about this requirement, along with the list of EPA-designate items, is available at EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>

8. Domestic Preference for Procurements

To the extent consistent with law, and to the greatest extent practicable, the County prefers the purchase, acquisition, or use of goods, products, or materials produced in the United States, including, but not limited to iron, aluminum, steel, cement, and other manufactured products.

“Produced in the United States” means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

“Manufactured products” means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

9. No Obligation by the Federal Government:

The Federal Government is not a party to this contract and is not subject to any obligations or liability to the County, Contractor, or any other party pertaining to any matter resulting from this contract.

10. Program Fraud and False or Fraudulent Statements or Related Acts:

The Contractor acknowledges that 31 USC Chapter 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

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 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 contract (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. 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:

Kevin Yarris
Director, General Services
120 West Main Street Suite D
Woodland, CA 95695
Telephone: (530) 406-5005

Contractor:

Broward Builders, Inc.
Randy Cantrell, Vice President
1200 E Kentucky Avenue
Woodland CA 95776
Telephone: (530) 666-5635

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. The plans and specifications attached as Exhibit A are part of this Agreement. If any conflict arises between Exhibit A and the terms and conditions set forth in Sections 1 through 14 of this Agreement, then Sections 1 through 14 shall govern.

(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) **Dispute Resolution.** Unless the General Conditions provide otherwise, if the Contract

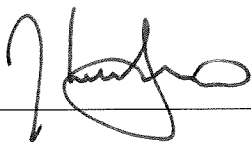
Administrator notifies Contractor that the work or any portion of it is unacceptable, then the Contract Administrator and Contractor shall meet at the Yolo County Office of County Administrator, 625 Court Street #202, Woodland, California, within five (5) days after Contractor receives the notice (excluding Saturdays, Sundays, and County observed holidays) and shall attempt in good faith to resolve their differences. Payment shall not constitute approval or acceptance of any defective work.

(g) **Integration.** This Agreement sets forth the parties' entire understanding regarding the matters set forth in Sections 1 through 14. It supersedes all prior Agreements and representations, written and oral, and may be modified only by a written Agreement approved by County's Board of Supervisors and signed by County and Contractor.

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

COUNTY OF YOLO:

By: _____



Kevin Yarris Director, General Services

CONTRACTOR:

Broward Builders, Inc.
Randy Cantrell, Vice President

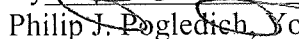
By: _____


(Signature)
(Print Name & Title)

(Date)

APPROVED AS TO FORM

By: _____


Philip J. Pogledich, Yolo County Counsel

2022 JUN 29 PM 1:56:42
BROWARD'S PROCUREMENT



1200 E. Kentucky Ave.
Woodland, CA 95776

To:

Bid for:

Yolo Branch Library

(Bidder to attach additional sheets as necessary)

SECTION 00 45 00

BIDDER INFORMATION SHEET

Bidder must check one of the following classifications which 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:

Broward Builders, Inc.

Corporation is incorporated in the State of:

California

☐ () 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 a Fictitious Name is filed – (If none, so state):

Accompanying this proposal is Bidder's 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.

Broward Builders, Inc.

Dennis Broward, President Randy Cantrell, Vice President Henry Powell Jr., General Superintendent

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

License No. 602146 Classifications(s) A, B, C-8, C-9

DIR Registration No.: 1000000001

(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

(Fill in addenda numbers if addenda 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
Affidavit 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 29th day of June, 2021 at Woodland,
California.



Sign Here: Randy Cantrell

by

Randy Cantrell, Vice President
Name and Title of Bidder

Broward Builders, Inc.
Name of Firm

SECTION 00 41 00

BID FORM

Project: Yolo Branch Library, 37750 Sacramento Street, Yolo, California

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 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).

Addendum #	Issue Date	Bidder's Acknowledgement (initials)
Addendum #1	June 16, 2021	
Addendum #2	June 22, 2021	
Addendum #3	June 24, 2021	

- (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 00700 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:

Base Bid Total Price for the Yolo Branch Library Project

\$ 3,575,000.00

(written) Three million five hundred seventy five thousand Dollars

Enclosed find Bidder's Bond certified check or cashier's check No. _____ of the
Travelers Casualty & Surety Co. _____ (Company/Bank), for \$ _____.

Dated this 29th day of June, 2021

Unit Pricing

Off-haul and disposal of unsuitable soil (no haz mat), per cubic yard: \$ 23.00

Import of engineered fill, per cubic yard: \$ 31.00

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 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 (Contract).
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 (Agreement).
12. The undersigned herewith encloses the completed Non-Collusion Affidavit – 00 45 10.
13. The undersigned herewith encloses the completed DAS Form 7 – 00 45 26.
14. The undersigned herewith encloses the completed Bidder Information Sheet – 00 45 00.

15. The names of all persons interested in the foregoing Bid as principals are:

Broward Builders, Inc.

Dennis Broward, President

Randy Cantrell, Vice President

Henry Powell Jr., General Superintendent

(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:

Broward Builders, Inc.

Legal Name of Corporation or Firm

CA Contractor's License No. 602146

DIR Registration No. 1000000001

Business Address 1200 E. Kentucky Avenue

Woodland, CA 95776

Email Address randy@browardbuilders.com

Telephone Number (530) 666-5635

Date of Bid June 29, 2021

Randy Cantrell

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

Randy Cantrell

Printed Name

Vice President

Title

SECTION 00 45 10

NON-COLLUSION AFFIDAVIT

**Non-Collusion Affidavit To Be Executed
By Bidder and Submitted with Bid**

State of California)

) ss.

County of Yolo)

Randy Cantrell, being first duly sworn, deposes and says that he or she
is

Vice President of Broward Builders, Inc. the party making the foregoing bid
that the bid is not made in the interest of, or in behalf of, any undisclosed person, partnership, company,
association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder
has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has
not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in
a sham bid, or that anyone shall refrain from bidding; that the bidder has not in 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 secure any advantage against the public body awarding the contract of
anyone interested in the proposed contract; that all statements contained in the bid are true; and further,
that 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, or paid, and will not pay, any
depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Broward Builders, Inc.

COMPANY NAME

1200 E. Kentucky Avenue, Woodland, CA 95776

COMPANY ADDRESS



SIGNATURE OF OFFICER

Randy Cantrell, Vice President

TITLE

SECTION 00 45 26

AGREEMENT TO TRAIN APPRENTICES

DAS Form 7

Joint Apprenticeship Committee Participation Requirement

The County adopted a policy that one of requirements to be deemed a responsive bidder is that the bidder must be participating in a joint apprenticeship committee. The California Department of Industrial Relations defines a joint apprenticeship committee as a committee made up of equal number of members from labor and management. **Bidders must complete and submit the attached California Department of Industrial Relations' DAS-7 form that documents the bidder's participation in a joint apprenticeship committee.** The County will verify participation prior to the award.

AGREEMENT TO TRAIN APPRENTICES

RECEIVED
DIR/DAS
SACRAMENTO

17 MAR 30 PM 3: 57

District No. 00
DAS File No. 10660
Employer ID 1000000034

1000027126

NAME OF EMPLOYER Broward Builders, Inc.			
MAILING ADDRESS (STREET AND NUMBER) 1200 E. Kentucky Ave.,	CITY Woodland,	STATE CA	ZIP CODE 95776
ADDRESS OF TRAINING LOCATION (IF DIFFERENT)		PHONE NUMBER (530)666-5635	
OCCUPATION Construction Craft Laborer		Order Code 47-2061.00	
NAME OF APPRENTICESHIP COMMITTEE AND STANDARDS Associated Builders & Contractors Northern California Chapter Construction Craft Laborer U. A. C.			
AREA COVERED BY APPRENTICESHIP STANDARDS (NAME AND ADDRESS OF PROJECT) Alameda, Contra Costa, El Dorado, Fresno, Marin, Napa, Placer, Sacramento, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma, Stanislaus, Tuolumne, Yolo (18 Northern California Counties)			

THE OFFICIAL, whose signature follows, agrees on behalf of the above named employer to train apprentices in the designated occupation in accordance with the apprenticeship standards and apprentice agreement and to comply with the provisions thereof.

(SIGNED) By [Signature]
Printed name Dennis Broward
Title President Date 2/17/17

THE APPRENTICESHIP COMMITTEE accepts and approves the employer as qualified to train apprentices under its standards in the designated occupation.

(SIGNED) By [Signature]
Printed name Sagit Woodbury
Title Apprenticeship Director Date 3/28/17

Effective until:

- ☒ Revoked
☐ End of Project. (Enter project name and address in Area Covered above)
☐ Date _____
☐ Other _____

Accepted:
DIVISION OF APPRENTICESHIP STANDARDS

EFFECTIVE DATE
2-17-17

(SIGNED) By [Signature] Date 4/10/17
Apprenticeship Consultant

REMARKS:

STATE OF CALIFORNIA
DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF APPRENTICESHIP STANDARDS

AGREEMENT TO TRAIN APPRENTICES

District No. 05
 DAS File No. 00076
 Employer ID _____

NAME OF EMPLOYER Broward Builders, Inc.			
MAILING ADDRESS (STREET AND NUMBER)		CITY	STATE
1200 E. Kentucky Ave., Woodland, CA 95776		CA	95776
ADDRESS OF TRAINING LOCATION (IF DIFFERENT)		TELEPHONE NUMBER	
		(530) 666-5635	
OCCUPATION(S)		O'Net Code	
Drywall Finisher (Taper)			
NAME OF APPRENTICESHIP COMMITTEE AND STANDARDS			
DC 16 Drywall Finishers JATC			
AREA COVERED BY APPRENTICESHIP STANDARDS (CITY AND ADDRESS OF PROJECT)			
2020 W. Williams St. SFA, San Leandro, CA 94577			

THE OFFICIAL, whose signature follows, agrees on behalf of the above-named employer to train apprentices in the designated occupation in accordance with the apprenticeship standards and apprentice agreement and to comply with the provisions thereof.

(SIGNED) By Randy Cantrell
 Printed name Randy Cantrell
 Title Vice President Date 4/1/19

THE APPRENTICESHIP COMMITTEE accepts and approves the employer as qualified to train apprentices under its standards in the designated occupation.

(SIGNED) BY Alex Beltran Ala Beltran
 Printed name _____
 Title DOT Date 4/1/19

- Effective until:
- ☒ Revoked
 - ☐ End of Project (Enter project name and address in Area Covered above)
 - ☐ Date _____
 - ☐ Other _____

Accepted:
 DIVISION OF APPRENTICESHIP STANDARDS

EFFECTIVE DATE 4/1/19
 (SIGNED) By [Signature] Date 5/24/2021
 Apprenticeship Consultant

REMARKS:

STATE OF CALIFORNIA
 DEPARTMENT OF INDUSTRIAL RELATIONS
 DIVISION OF APPRENTICESHIP STANDARDS

CARPENTERS

46 Northern California Counties Conference Board

CHRIS PEDROZA

Executive Director

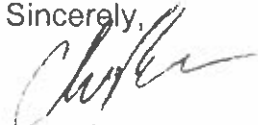
June 17, 2021

To Whom It May Concern:

As of this date, **Broward Brothers, Inc. (044293-053006)** is currently bound and signatory to the 2018-2023 Carpenters Master Agreement for Northern California.

Should you have any questions, please do not hesitate to contact this office.

Sincerely,



Chris Pedroza
Executive Director

CP: jm



OPERATING ENGINEERS JOURNEYMEN APPRENTICE TRAINING CENTER
FOR NORTHERN CALIFORNIA

14738 Cantova Way - Sloughhouse, CA 95683 - (916) 354-2029 - FAX (916) 354-1126

June 16, 2021

Re: Signatory Status

To Whom It May Concern,

The apprenticeship standards submitted by the Operating Engineers JATC were approved by the Federal Department of Labor in 2007 and the California Department of Industrial Relations, Division of Apprenticeship Standards in 1962. The apprenticeship program has operated continuously since its inception in 1962 and serves the 46 Counties of Northern California.

This letter is to advise you that Broward Builders, Inc. is approved to train apprentices by virtue of their signatory status with Operating Engineers Local #3 Union in Northern California.

All apprentices employed by Broward Builders, Inc. that perform operating engineer work are registered with both the State of California Division of Apprenticeship Standards and the Federal Department of Labor. The apprentices are active participants in the apprenticeship programs sponsored by Operating Engineers Local #3 – JATC Training Committee for Northern California. Furthermore, be advised that Operating Engineers Local #3 – JATC Training Committee for Northern California does maintain a graduation rate of at least 55%.

Operating Engineers JAC

Greg Gasaway

Director of Apprenticeship

NORTHERN CALIFORNIA CEMENT MASONS

JOINT APPRENTICESHIP
AND
TRAINING COMMITTEE

2600 Kitty Hawk Road
Suite 115
Livermore, CA 94551
TEL (925) 484-2271
FAX (925) 484-2312



Sent Via Email

June 17, 2021

RE: BROWARD BUILDERS, INC.

To Whom It May Concern:

Please be advised that Broward Builders, Inc. is a signatory employer under the Cement Masons Master Labor Agreement between the Associated General Contractors of California, Inc. and District Council of Plasterers and Cement Masons of Northern California.

Pursuant to the terms of said agreement, Broward Builders, Inc. is approved to employ and train Cement Mason apprentices under the Apprenticeship Standards of the Northern California Cement Masons Joint Apprenticeship and Training Committee and as certified by the State of California, Department of Industrial Relations, Division of Apprenticeship Standards, and the U.S. Department of Labor, Office of Apprenticeship.

If you have any questions or need further information, please do not hesitate to call.

Sincerely,

Veronica Godinez
Director

VG/msm
opeiu:29 afl-cio

SECTION 00 43 00

SUBCONTRACTOR LIST

Yolo Branch Library

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. (Note: All column and row spaces for each listed subcontractor shall be filled in with; Work to be Performed, Name of Subcontractor, Bid Price, DIR and CA License type(s) and Number(s), Mailing Address and Phone Number). Use additional lists as necessary. The awarded contractor will be required to fully fill in all rows and columns of this list.

WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO. & CA LICENSE TYPE/ NO.	MAILING ADDRESS AND PHONE NUMBER
Concrete Reinforcement	Camblin Steel Service		1000003852 218839	Roseville, CA
Thin Brick	Black Marble & Granite		1000585208 853339	Esparto, CA
CMU	Black Marble & Granite		1000585208 853339	Esparto, CA
Metals	J McDowell Welding		1000057486 1005760	Winters, CA
Casework	Elite Wood Design		1000042152 931560	Rancho Cordova, CA
Insulation	Alcal Specialty Contracting		100000315 815286	Sacramento, CA
Roof Shingles	George Roofing		1000005383 452266	Oroville, CA
Single-Ply Roofing	California Single Ply		1000007318 662255	Rocklin, CA

SECTION 00 43 00

SUBCONTRACTOR LIST

Yolo Branch Library

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WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO. & CA LICENSE TYPE/ NO.	MAILING ADDRESS AND PHONE NUMBER
~~Earthwork~~				
~~AC Paving~~				
~~Brick Pavers~~				
Landscaping	Aerco Pacific		1000004143 166242	Rancho Cordova, CA
~~Site Utilities~~				

SECTION 00 43 00

SUBCONTRACTOR LIST

Yolo Branch Library

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. (Note: All column and row spaces for each listed subcontractor shall be filled in with; Work to be Performed, Name of Subcontractor, Bid Price, DIR and CA License type(s) and Number(s), Mailing Address and Phone Number). Use additional lists as necessary. The awarded contractor will be required to fully fill in all rows and columns of this list.

WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO. & CA LICENSE TYPE/ NO.	MAILING ADDRESS AND PHONE NUMBER
Sheet Metal				
Joint Sealants				
Multi Slide Doors				
Windows				
Auto Door Operators				
Ceramic Tile	B.N.T. Tile		1000046452 1022374	Wheatland, CA
Acoustic/Linear Wood Ceilings	Performance Contracting		1000004922 474795	North Highlands, CA
Resilient Flooring	DFS Flooring		1000006695 999046	Sacramento, CA

SECTION 00 43 00

SUBCONTRACTOR LIST

Yolo Branch Library

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. (Note: All column and row spaces for each listed subcontractor shall be filled in with; Work to be Performed, Name of Subcontractor, Bid Price, DIR and CA License type(s) and Number(s), Mailing Address and Phone Number). Use additional lists as necessary. The awarded contractor will be required to fully fill in all rows and columns of this list.

WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO. & CA LICENSE TYPE/ NO.	MAILING ADDRESS AND PHONE NUMBER
Carpet	DFS Flooring		1000006695 999046	Sacramento, CA
Painting	Cut In Edge Painting		1000058802 1041100	Cottonwood, CA
Signage				
Fireplace	CAPO Fireside		1000047199 557555	Sacramento, CA
Fire Sprinklers	Marquee Fire Protection		1000000041 570970	Sacramento, CA
Plumbing	AP Plumbing & Fire		1000019409 656592	Woodland, CA
Hvac	Planet Mechanical		1000048897 829096	Folsom, CA
Electrical	Lecair Electric		1000053184 994305	Citrus Heights, CA

SECTION 00 42 00

COUNTY OF YOLO BIDDER'S BOND

We, Broward Builders, Inc. as Principal, and
Travelers Casualty and Surety Company of America 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 Branch Library for
which bids are to be opened in public in the Erwin Meier Administration Building, 625 Court Street,
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: June 11, 2021

Randy Cantrell
Randy Cantrell, V.P.
Broward Builders, Inc.
Principal

Travelers Casualty and Surety Company of America
Surety

By: Edward D. Johnson
Edward D. Johnson Attorney-in-Fact

ADDRESS OF SURETY FOR SERVICE OF NOTICE:

Travelers Casualty and Surety Company of America
11070 White Rock Rd., Ste. 130
Rancho Cordova, CA 95670

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

ACKNOWLEDGMENT

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 Placer)

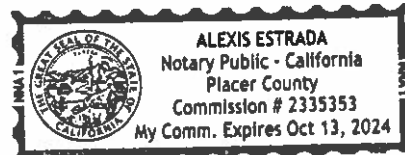
On June 11th, 2021, before me, Alexis Estrada, Notary Public
(insert name and title of the officer)

personally appeared Edward D. Johnson,
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 California that the foregoing
paragraph is true and correct.

WITNESS my hand and official seal.

Signature  (Seal)





**Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company**

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Edward D. Johnson** of **ROSEVILLE California**, their true and lawful Attorney-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this 17th day of January, 2019.



State of Connecticut

City of Hartford ss.

By: _____


Robert L. Raney, Senior Vice President

On this the 17th day of January, 2019, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the 30th day of June, 2021




Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

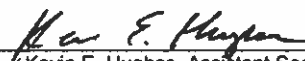
FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this 11th day of June, 2021




Kevin E. Hughes, Assistant Secretary

**To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney-in-Fact and the details of the bond to which this Power of Attorney is attached.**



CONTRACTORS
STATE LICENSE BOARD
ACTIVE LICENSE



Contract Number: **602146** Entity: **CORP**
Business Name: **BROWARD BUILDERS INC**

Classification: **B A C-9 C-8 ASB**

Expiration Date: **09/30/2022**

www.cslb.ca.gov



SECTION 00 43 00

SUBCONTRACTOR LIST

Yolo Branch Library

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. (Note: All column and row spaces for each listed subcontractor shall be filled in with; Work to be Performed, Name of Subcontractor, Bid Price, DIR and CA License type(s) and Number(s), Mailing Address and Phone Number). Use additional lists as necessary. The awarded contractor will be required to fully fill in all rows and columns of this list.

WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO. & CA LICENSE TYPE/ NO.	MAILING ADDRESS AND PHONE NUMBER
Concrete Reinforcement	Camblin Steel Service	\$30,460	1000003852 218839 C50	548 Gibson Dr. Roseville, CA (916) 644-1300
Thin Brick	Black Marble & Granite	\$38,158	1000585208 853339 C29	24491 County Road 23A Esparto, CA (530) 681-5547
CMU	Black Marble & Granite	Included in Thin Brick	1000585208 853339 C29	24491 County Road 23A Esparto, CA (530) 681-5547
Metals	J McDowell Welding	\$35,820	1000057486 1005760 C60	PO Box 1210 Winters, CA (530) 661-6006
Casework	Elite Wood Design	\$235,971	1000042152 931560 B, C6	2616 Mercantile Drive Rancho Cordova, CA (916) 856-7700
Insulation	Alcal Specialty Contracting	\$18,235	100000315 815286 B, C2	4201 Sierra Point Dr, Suite 1 Sacramento, CA (916) 929-3100
Roof Shingles	George Roofing	\$28,468	1000005383 452266 B, C39, C43	6810 Lincoln Blvd. Oroville, CA (530) 533-6393
Single-Ply Roofing	California Single Ply	\$17,850	1000007318 662255 C39, B, C34	PO Box 2799 Rocklin, CA (916) 408-6800

SECTION 00 43 00

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WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO. & CA LICENSE TYPE/ NO.	MAILING ADDRESS AND PHONE NUMBER
Sheet Metal				
Joint Sealants				
Multi Slide Doors				
Windows				
Auto Door Operators				
Ceramic Tile	B.N.T. Tile	\$30,626	1000046452 1022374 C54, C15	502 Main Street Wheatland, CA (530) 788-26
Acoustic/Linear Wood Ceilings	Performance Contracting	\$107,245	1000004922 474795 B, C2	3030 Orange Grove Ave. North Highlands, CA (916) 576-39
Resilient Flooring	DFS Flooring	\$28,392	1000006695 999046 C15, C54,C61	10461 Old Placerville Rd. Sacramento, CA (916) 330-230

SECTION 00 43 00

SUBCONTRACTOR LIST

Yolo Branch Library

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WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO. & CA LICENSE TYPE/ NO.	MAILING ADDRESS AND PHONE NUMBER
Carpet	DFS Flooring	Included in Resilient Flooring	1000006695 999046 C15, C54, C61	10461 Old Placerville Rd. Sacramento, CA (916) 330-230
Painting	Cut In Edge Painting	\$48,355	1000058802 1041100 C33, C61	24499 Cloud Creek Place Cottonwood, CA (916) 803-504
Signage				
Fireplace	CAPO Fireside	\$25,300	1000047199 557555 C61	1560 Santa Ana Ave. Sacramento, CA (916) 970-274
Fire Sprinklers	Marquee Fire Protection	\$39,750	1000000041 570970 C16	710 W. Stadium Lane Sacramento, CA (916) 641-799
Plumbing	AP Plumbing & Fire	\$45,736	1000019409 656592 C36, C16	21 Harter Avenue Woodland, CA (530) 666-26
Hvac	Planet Mechanical	\$108,000	1000048897 829096 C20	105 Arrowsmith Drive Folsom, CA (916) 743-3871
Electrical	Lecair Electric	\$286,200	1000053184 994305 C10	6830 Antelope Road, Suite D Citrus Heights, CA (916) 735-3

SECTION 00 43 00

SUBCONTRACTOR LIST

Yolo Branch Library

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WORK TO BE PERFORMED	NAME OF SUBCONTRACTOR	BID PRICE	DIR REGISTRATION NO. & CA LICENSE TYPE/ NO.	MAILING ADDRESS AND PHONE NUMBER
~~Earthwork~~				
~~AC Paving~~				
~~Brick Pavers~~				
Landscaping	Aerco Pacific	\$103,000	1000004143 166242 C27	11370-J Amalgam Way Rancho Cordova, CA (916) 635-56
~~Site Utilities~~				



PROJECT MANUAL

Volume 2: Project Specifications

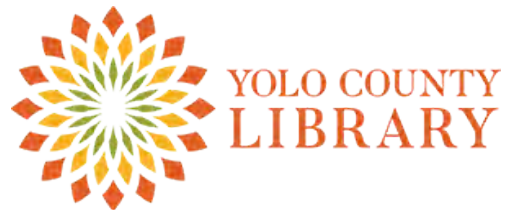
May 7, 2021

Yolo Branch Library

37750 Sacramento Street, Yolo, California



County of Yolo



DIVISION 1 - GENERAL REQUIREMENTS		
	01 00 00	General Requirements
	01 10 00	Summary
	01 20 00	Application for Payment
	01 23 13	Phasing
	01 25 00	Product Options and Substitutions
	01 26 00	Contract Modification Procedures
	01 26 15	Requests for Interpretation (RFI)
	01 29 73	Schedule of Values
	01 31 19	Project Meetings
	01 32 16	Construction Schedules
	01 32 33	Photographic Documentation
	01 33 23.21	Electronic Submittal Procedures
	01 42 00	References
	01 45 23	Testing Laboratory Procedures
	01 50 00	Temporary Facilities and Controls
	01 56 39	Temporary Tree and Plant Protection
	01 66 00	Product Storage and Handling Requirements
	01 70 00	Record Documents
	01 74 00	Cleaning and Waste Management
	01 74 19	Construction Waste Management and Disposal
	01 78 00	Contract Closeout
	01 78 37	Warranties
DIVISION 2 – EXISTING CONDITIONS		
	02 32 13	Subsurface Conditions
	02 41 19	Selective Demolition
DIVISION 3 - CONCRETE		
		<i>Cast-in-Place Concrete - refer to Structural Drawings</i>
DIVISION 4 - MASONRY		
	04 21 13	Thin Brick Veneer
	04 22 23	Concrete Unit Masonry
DIVISION 5 - METALS		
	05 50 00	Metal Fabrications
	05 51 33	Metal Ladders
	05 52 13	Pipe and Tube Railings
DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES		
		<i>Rough Carpentry and Glu-Laminated Wood Members - refer to Structural Drawings</i>
	06 16 43	Insulating Sheathing
	06 20 00	Finish Carpentry
	06 41 00	Architectural Wood Casework
	06 60 00	PVC Moulding and Trim

DIVISION 7 – THERMAL AND MOISTURE PROTECTION		
	07 21 00	Thermal Insulation
	07 31 13	Composition Shingles
	07 46 46	Mineral Fiber Cement Siding
	07 54 19	Single Ply Membrane Roofing
	07 62 00	Sheet Metal Flashings and Trim
	07 71 00	Roof Specialties
	07 84 13	Penetration Firestopping
	07 92 00	Joint Sealants
DIVISION 8 – OPENINGS		
	08 11 13	Hollow Metal Doors and Frames
	08 13 73	Aluminum-Wood Multi-Slide Doors
	08 14 33	Stile and Rail Wood Doors
	08 34 00	Special Function Doors
	08 52 13	Aluminum Clad Wood Windows
	08 71 00	Door Hardware
	08 71 13	Automatic Door Operators
	08 80 00	Glazing
		<i>Louvers and Vents - refer to Mechanical Drawings</i>
DIVISION 9 - FINISHES		
	09 29 00	Gypsum Board
	09 30 00	Tiling
	09 51 13	Suspended Acoustical Ceilings
	09 54 26	Linear Wood Ceiling System
	09 65 19	Resilient Tile Flooring
	09 68 13	Tile Carpeting
	09 77 20	Fiberglass Reinforced Panels
	09 91 00	Painting and Coating
DIVISION 10 - SPECIALTIES		
	10 11 46	Linoleum Bulletin Board
	10 14 00	Signage
	10 21 13	Toilet Compartments
	10 28 00	Toilet Accessories
	10 31 00	Manufactured Fireplaces
	10 44 13	Fire Extinguishers and Cabinets
DIVISION 11 - EQUIPMENT		
	11 31 00	Kitchen Appliances
	11 51 00	Library Equipment
DIVISION 12 – FURNISHINGS		
	12 24 13	Roller Window Shades
	12 92 00	Site Furnishings
DIVISION 21 – FIRE SUPPRESSION		
		<i>Water-Based Fire Suppression Systems – by Contractor</i>

<u>DIVISION 22 – PLUMBING</u>		
	22 05 00	Basic Mechanical Materials and Methods
	22 05 29	Hangers and Supports for Plumbing Piping and Equipment
	22 07 19	Plumbing Piping Insulation
	22 11 16	Domestic Water Piping
	22 13 16	Sanitary Waste and Vent Piping
	22 13 19	Sanitary Waste Piping Specialties
	22 40 00	Plumbing
<u>DIVISION 23 – HEATING, VENTILATION AND AIR CONDITIONING</u>		
	23 07 13	Duct Insulation
	23 08 00	HVAC
	23 31 13	Metal Ducts
<u>DIVISION 26 - ELECTRICAL</u>		
	26 05 00	Common Work Results for Electrical
	26 05 19	Low-Voltage Electrical Power Conductors and Cables
	26 05 26	Grounding
	26 05 33	Raceways and Boxes for Electrical Systems
	26 24 16	Panelboards
	26 27 26	Wiring Devices
	26 28 00	Low-Voltage Circuit Protective Devices
	26 50 00	Exterior Lighting
	26 51 00	Interior Lighting
	26 52 00	Emergency Lighting
	26 53 00	Exit Signs
<u>DIVISION 27 - COMMUNICATIONS</u>		
	27 10 00	Structured Cabling System
<u>DIVISION 28 – ELECTRONIC SAFETY AND SECURITY</u>		
		<i>Fire Detection and Alarm - refer to Electrical Drawings</i>
<u>DIVISION 31 – EARTHWORK</u>		
		<i>refer to Civil Drawings</i>
<u>DIVISION 32 EXTERIOR IMPROVEMENTS</u>		
		<i>Concrete and Asphalt Paving – refer to Civil Drawings</i>
	32 14 16	Sand Set Brick Pavers
	32 15 40	Decomposed Granite
	32 84 00	Irrigation System
	32 92 10	Landscape Turf Grass
	32 93 00	Landscape Installation
	32 98 00	Landscape Maintenance
<u>DIVISION 33 - UTILITIES</u>		
		<i>refer to Civil Drawings</i>

END TABLE OF CONTENTS for VOLUME 2

GENERAL

1.1 SUMMARY

- A. This Section describes general requirements that pertain to each Section of these Specifications.

1.2 COORDINATION OF DOCUMENTS

- A. Documents affecting all Work in this contract and each Section of these Specifications include, but are not limited to, Sections in Division One of these Specifications, the General Conditions of the Contract and the Supplementary Conditions. These documents must be read with the other Contract Documents and Sections of this Specification as a whole to complete the intent of the contract.
- B. Sections in Division One of these Specifications contain obligations for Work of remaining Sections and must be read with all Sections to identify all the requirements of each Section.
- C. The layout of materials, equipment and systems is generally diagrammatic, unless specific dimensions are indicated. Some work may be shown offset for clarity. The actual location of all materials and systems above and below the ceiling, including but not limited to, piping, ductwork, fixtures, equipment, supports, conduit, suspension wires, ceiling grids and panels, etc., shall be carefully planned and coordinated by the General Contractor prior to installation of any work. The General Contractor shall be responsible for coordinating the architectural, structural, plumbing, mechanical, electrical, and/or other elements of the work.

1.3 RELATED WORK BETWEEN SECTIONS

- A. This Contract may require several trades to complete the finished intent of the Work. Coordinate the various trades and pertinent sections of these Specifications with the Drawings to ensure proper and timely completion of the Work.

1.4 QUALITY ASSURANCE

- A. For all Sections of Work in these Specifications and for all tasks and obligations of the Contract, provide skilled work persons thoroughly trained and experienced in the types of construction methods and techniques in each trade required to complete the Work, and who shall be present at all times during the progress of the Work of each trade.
- B. No exception will be made to Contractor nor acceptance given to unacceptable work caused by lack of skill, inappropriate methods or lack of due care in craftsmanship. The level of performance shall, at a minimum, meet or exceed the level of performance set by a regionally or nationally recognized association that produces, publishes, and enforces industry standards for that trade or craft, unless a higher level of performance is specified herein. All such unacceptable work shall be replaced by the Contractor in a good craftsman-like manner at no additional expense to the Owner.

1.5 CODES AND STANDARDS

- A. All Work of this contract shall conform to the latest edition of all pertinent codes and regulations governing the completion of the Work.
- B. Trade association publications and industry standards as published by recognized bodies within each trade shall be references for conducting Work and in inspection of the quality of Work in each Section of these Specifications. See Section 014200 – References.

1.6 CUTTING AND PATCHING

- A. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

- B. Perform cutting and demolition by methods which will prevent damage to other portions of the Work and provide proper surfaces to receive installation of repair and new work
- C. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

1.7 SURFACE CONDITIONS

- A. Prior to commencement of Work in any trade, carefully inspect the installed Work of all other trades and verify that all such Work is complete to the point where subsequent Work may properly commence.
- B. Verify the Work to be performed may be installed in strict accordance with all pertinent codes and regulations, the original design, addendum and change orders, approved shop drawings and manufacturers' literature.

1.8 DISCREPANCIES

- A. In the event of discrepancies in any area of Work, immediately notify the Architect. Do not proceed with installation until all such discrepancies have been fully resolved.

1.9 SITE DUST CONTROL

- A. Use all means necessary to prevent spread of dust during performance of the Work. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public and concurrent performance of other Work on the site.

1.10 PERMITS

- A. Building Permit: The Contractor shall pull the Building Permit from the County (Jurisdiction Having Authority). The Owner will pay related permit and impact fees.
- B. Other Permits: The Contractor shall secure Right-of-Way Encroachment permits and all deferred Fire Protection (fire sprinkler, fire underground service, and fire alarm) permits. Fees for these permits shall be included in the Contract and paid by the Contractor.

1.11 CONTRACT DOCUMENTS

- A. The Owner will provide the Contractor with one electronic set of plans and specifications in PDF format for the construction of the project. The plans and specifications provided by the Owner will match the documents approved by the County under the building permit. All printed sets, in whole or in part, required by the Contractor to perform the work shall be at the Contractor's expense.

1.12 FIELD CONDITION VERIFICATION

- A. The Contractor shall field verify existing field conditions and accept them as conditions of this scope of work.

1.13 SEPARATE CONTRACTORS

- A. If any part of this Contractor's work depends upon the work of a separate Contractor, this Contractor shall inspect such other work and promptly report in writing to the Architect any defects in such other work that render it unsuitable to receive the work of this Contractor. Failure of this Contractor to so inspect and report shall constitute an acceptance of the other Contractor's work, except as to defects which may develop in other Contractor's work after execution of this Contractor's work.

1.14 CONSTRUCTION LIMITS

- A. Contractor and Subcontractor work shall be confined within the areas designated as Construction Limits. The Construction Limits shall be set by the Construction Project Manager, and it shall be the responsibility of the General Contractor and Subcontractors to verify and follow these limits.
- B. The Contractor shall meet with the Construction Project Manager prior to the beginning of the work to establish storage areas for materials and equipment, and access routes for delivery and removal of materials, supplies, equipment, etc. that are required for this work.

1.15 COMPLETENESS OF WORK

- A. It is the intent of the contract documents that the Contractor shall turn over to the Owner a complete project. Any work not specifically called for or specified but required to comply with the intent of quality and completeness, shall be performed as part of the contract.

1.16 PENETRATIONS AT FIRE-RATED WALLS

- A. All penetrations/openings through rated walls, ceilings, floors, etc. shall be sealed with an approved fire stopping material of equal to or greater rating (i.e., 1-hr., 2-hr., 3-hr., etc.). Fire stopping material used must be approved for use by the California State Fire Marshal. Contractor must provide the Architect with written verification and installation details prior to installation which indicates proper fire rating for the given condition and proof of California State Fire Marshall approval. Reference Section 07 84 13 Penetration Firestopping in this specification.

1.17 ENCLOSING OF WORK

- A. Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this Section prior to all required inspections, tests and approvals.
- B. Should any of the work be so enclosed or covered up before it has been approved, uncover all such work at no additional cost to the Owner.
- C. After the work has been completely inspected, tested and approved, make all repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the Owner.

END OF SECTION 01 00 00

GENERAL

1.1 SUMMARY OF WORK

- A. Project: Yolo Branch Library
- B. Owner: Yolo County Library, County of Yolo
- C. Architect: WMB Architects
- D. Construction Manager: Kitchell
- E. The Work consists of the construction of 4,000 square foot (approximate) single story Type VB library building and associated site improvements as set forth on the Drawings and described in these Specifications.
- F. Owner-Furnished Items: The following products will be furnished by Owner and shall be installed by Contractor as part of the Work:
 - 1. Items salvaged from original library building identified on the Drawings for integration into new construction.

1.2 WORK RESTRICTIONS

- A. COMMON AREAS:
 - 1. All "common" areas impacted by this scope of work shall be left in the same condition as prior to work commencing. This shall include but not be limited to cleaning and repairing finishes damaged or soiled in executing this Contract.
- B. COORDINATION WITH OWNER:
 - 1. All work is to be scheduled with the Construction Manager including construction access and storage. The Construction Schedule procedure shall be approved by the Construction Manager prior to Start of Construction. No work shall commence at project site prior to the issuance and posting of a building permit.
- C. FACILITY UTILITIES:
 - 1. The Contractor shall make every effort to keep the existing facility utilities in operation. The Contractor shall notify the Owner a minimum of 48 hours in advance for allowance of disruption in services. Disruption in services shall only be at the Owner's discretion.
- D. FACILITY DAMAGE:
 - 1. It shall be the Contractor's responsibility to repair or replace any existing items or surfaces that are damaged during the construction. They shall be restored to original condition or finished to match adjacent surfaces at no additional cost to the Owner.
- E. BUILDING AND SITE SECURITY
 - 1. The Contractor shall be responsible for maintaining the building and the site in a secured condition in the area that is involved in this work at all times during the construction.

1.3 COVID-19 SPECIAL REQUIREMENTS

- A. Some or all of the work will be performed during a state of emergency due to the COVID-19 pandemic. Minimizing the risk of transmission among workers is essential. Contractor shall take reasonable efforts to follow these guidelines to increase hygiene on the jobsite and include within their bid the expense to accommodate:

1. Add sanitary facilities (toilet and hand washing stations with soap and hand sanitizer provided). Workers should both wash their hands with soap for twenty seconds and use hand sanitizer often.
2. Provide prescreening and temperature checks of all workers prior to entering site work area. Any worker suspected of being ill shall not be allowed to enter site without evidence of negative test results of Covid-19. Any positive testing of workers shall result in notification of County Health and most current tracing requirements established at the time.
3. Perform deep cleaning on jobsites including disinfecting handrails, doorknobs, equipment handles and tools on an accelerated basis.
4. Instead of having group safety meetings, and to keep the suggested social distance, hold smaller individual safety meetings at the jobsite maintaining social distancing guidelines.
5. Keep separation of at least 6 feet as feasible while on the job and always during rest and break periods and lunches; there should not be any group gatherings.
6. Ask workers to consider bringing a lunch made at home and stay away from congested lunch trucks and coffee shops. Ask workers to try and go directly from work to home and vice versa with as little contact with the general public as possible.
7. Ensure workers wear and utilize all safety equipment available on the jobsite. Contractors should provide all protective equipment as available.
8. Instruct sick workers to stay at home.
9. Remind workers not shake hands when greeting others.
10. Remind workers not to touch their eyes, noses, or mouth with unwashed hands.

END OF SECTION 01 10 00

GENERAL

1.1 SUMMARY

- A. Comply with procedures described in this Section when applying for progress payment and final payment under the Contract.

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 PROCEDURES

- A. Prior to start of construction, secure the Construction Manager's approval of the schedule of values as provided in Section 01 29 73.
- B. INFORMAL SUBMITTAL (unless otherwise directed by the Construction Manager):
 - 1. Make an informal submittal of request for payment by filling in, with erasable pencil, pertinent portions of AIA Document G702, "Application and Certificate for Payment," plus continuation sheet or sheets. Provide back-up data as required to verify all stockpiled materials.
- C. FORMAL SUBMITTAL (unless otherwise directed by the Construction Manager):
 - 1. After review of the informal request by the Construction Manager, make formal submittal of request for payment by filling in the data as agreed to in 1.3 B. Sign the Application and Certificate for Payment. Submit the original of the Application, Certificate for Payment, and the continuation sheets, to the Construction Manager.

1.4 RETENTION:

- A. Five percent (5%) of the certified amount be retained from each application to completion of the project.
- B. Upon completion of project closeout requirements and submission of final Certificate for Payment, retention will be released to the Contractor along with the balance of payment on the Contract.

END OF SECTION 01 20 00

GENERAL

1.1 SUMMARY

- A. The project is to be planned and constructed in such a way as to allow the existing modular library building to remain on site and operational (open to the public) during construction activities for the longest period of time possible.

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 DESCRIPTION

A. PLANNING AND TEMPORARY CONTROLS

- 1. The Contractor shall develop a Construction Schedule and Temporary Controls Plan that accommodate the operation of the existing library facility to the extent described on the Drawings.
 - a. The Construction Schedule shall identify the timeframe within which the existing modular building must be removed from the site in order to achieve project completion within the Contract Time.
 - b. The Temporary Controls Plan shall describe how the construction site will be secured and public protected while allowing access to the modular library building.

B. REMOVAL OF MODULAR BUILDING

- 1. The County shall be responsible for decommissioning and removing the modular building from the site.
- 2. The Contractor shall be responsible for modifying the construction fence and other temporary controls after the removal of the modular building in order to facilitate remaining construction work.
- 3. The Contractor shall be responsible for demolishing existing concrete pad under modular building and remaining site paving after the removal of the modular building as required to complete the construction work.

END OF SECTION 01 23 13

GENERAL

1.1 SUMMARY

- A. Procedures for securing approval of proposed substitutions.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 PRODUCT OPTIONS

- A. The Contract is based upon standards of quality established in the Contract Documents.
 - 1. In agreeing to the terms and conditions of the Contract, the Contractor has accepted a responsibility to verify that the specified products will be available and to place orders for all required materials in such a timely manner as is needed to meet his agreed construction schedule.
 - 2. Neither the Owner nor the Architect has agreed to the substitution of materials or methods called for in the Contract Documents, except as they may specifically be approved in this Section.
- B. Where the phrase "or equal" occurs in the Contract Documents, equivalent materials and/or methods may be proposed for substitution to those specified.
- C. The material and/or methods specified by name establish the standard of quality. All proposed substitutions to be used in lieu of specified materials and/or methods shall in all ways be equal to or exceed the qualities of that specification.
- D. Where proprietary products and/or systems are specified without the phrase "or equal", the Owner may require the use of the specified product/system in order to maintain property standards for parts and maintenance, and/or performance. It is the Contractor's responsibility to verify acceptance of substitutions prior to bid.
- E. Substitutions will not be considered for products/ systems when specification language clearly prohibits substitutions.

1.4 SUBMITTAL OF PROPOSED SUBSTITUTIONS

- A. Proposed substitutions of specified products, materials or methods, or those designated as "or equal" in the Drawings or Specifications, shall be submitted to the Architect for review a minimum of seven (7) working days in advance of the General Contract bid date.
- B. Proposed substitutions will be considered only when such proposals are accompanied by a completed 'Substitution Request' form (template follows), full and complete technical data, and all other information required by the Architect to evaluate the proposed substitution.
- C. Proposed substitutions submitted after a minimum of seven (7) working days in advance of the bid date will not be reviewed.
- D. The decision of the Architect will be final.

1.5 DELAYS

- A. Delays in construction arising by the non-availability of a specified material and/or method will not be considered by the Architect as justifying an extension of the agreed Time of Completion. Propose substitution for non-available items as in 1.4 above.

SUBSTITUTION REQUEST

Project: _____

To: _____ **A/E Project Number:** _____

From: _____ **Date:** _____

Contract For: _____ **Description** _____

Specification Title: _____ **Description:** _____

Section: _____ **Page** _____ **Article/Paragraph:** _____

Proposed Substitution: _____

Manufacturer: _____ **Address:** _____ **Phone:** _____

Trade Name: _____ **Model:** _____

Installer: _____ **Address:** _____ **Phone:** _____

History: ☐ New Product ☐ 2-5 Years Old ☐ 5-10 Years Old ☐ More than 10 Years Old

☐ Point-by-Point comparative data attached – REQUIRED BY A/E

Support Data

Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ Other

Reason for not providing specified item: _____

Similar Local Installation:

Project: _____ **Architect:** _____

Address: _____ **Owner** _____

Date Installed: _____

Similar Local Installation:

Project: _____ **Architect:** _____

Address: _____ **Owner** _____

Date Installed: _____

Similar Local Installation:

Project: _____ **Architect:** _____

Address: _____ **Owner** _____

Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes

Explain _____

Savings to Owner for accepting Substitution: _____ \$

Proposed Substitution Changes Contract Time: ☐ No ☐ Yes ☐ Add ☐ Deduct _____ Days

SUBSTITUTION REQUEST continued

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by:

Signed by:

Firm:

Address:

Telephone:

Attachments:

ARCHITECTS REVIEW AND ACTION

- ☐ Substitution approved – Make submittals in accordance with Specification Section 013323
- ☐ Substitution approved as noted – Make submittals in accordance with Specification Section 013323
- ☐ Substitution rejected – Use specified materials
- ☐ Substitution Request received too late – Use specified materials
- ☐ Additional information required for evaluation.

Signed By: _____ Date: _____

Additional Comments ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ Architect

END OF SECTION 01 25 00

GENERAL

1.1 SUMMARY

- A. Make such changes in the Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof, as are described in written Change Orders signed by the Owner and the Architect and issued after execution of the Contract, in accordance with the provisions of this Section.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 CHANGE ORDER PROCEDURES

- A. From time to time during the course of the Work, the Architect may issue an order for a minor change in the Work without change in the contract sum or contract time.
- B. Should the Contractor consider that a change in the contract sum or contract time is required, he will notify the Construction Manager before proceeding with the Work.
- C. The Owner may solicit proposals from the Contractor for possible changes to the contract by issuing a request for a Cost Change Proposal through the Construction Manager for the desired change.
- D. The Contractor will, upon receiving the request for a Cost Change Proposal, promptly complete the proposal for the described work. Provide an itemized proposal showing materials, labor, profit and overhead, and the effect on the critical path of the Construction Schedule. Include full back-up data such as subcontractors itemized letter of proposal, product data, invoices, and other pertinent data to substantiate the proposal. Return the completed proposal to the Architect on a copy of the Cost Change Proposal form at the end of this section. The Contractor may utilize his own form upon prior approval by the Owner.
- E. When cost or credit has been agreed upon by the Owner and Contractor, the Contractor shall submit a Potential Change Order to the Construction Manager for signature by the Architect and Owner.
- F. Approved Potential Change Orders will be collectively assembled into a Contract Change Order at certain intervals during the course of construction. Contract Change Orders shall be signed by all parties. The contract sum and contract time will be adjusted consecutively by each Contract Change Order as they are executed.
- G. In the event the Contractor is not in agreement with the Owner and Architect as to change in Contract Sum and/or Time of a proposed change to the Contract Documents, the Architect may issue a Construction Change Directive through the Construction Manager as provided in the General Conditions to the Contract.

END OF SECTION 01 26 00

GENERAL

1.1 SUMMARY

- A. This section contains the procedures to be followed by the General Contractor upon discovery of any apparent conflicts, omissions, or errors in the Contract Documents or upon having any questions concerning interpretation.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 DEFINITIONS

- A. Requests for Interpretation: A request from the General Contractor seeking an interpretation or a clarification of some requirement of the Contract Documents. The General Contractor shall clearly and concisely set forth the issue requiring clarification or interpretation and why a response is needed. Include in the request interpretation or understanding of the contract's requirements along with documentation for the interpretation or understanding. Responses from the Architect will not change any requirements of the Contract Documents.
- B. Drawing/Plan Clarification: An answer from the Architect in response to an inquiry from the General Contractor intended to make some requirement(s) of the drawings clearly understood. Drawing/plan clarifications maybe be sketches, drawings, or in narrative form and will not change any requirements of the drawings.
- C. Non-Conformance Notice: A notice issued by the Architect documenting that the work or some portion thereof has not been performed in accordance with the requirements of the Contract Documents. Payment will not be made on any portion of the work which a Non-Conformance Notice has been issued and the work not corrected to the Satisfaction of the Architect. Upon receipt of a Non-Conformance Notice, the General Contractor shall provide written response within 5 working days after receipt, noting why they believe the work was performed in accordance with the Contract Documents or what corrective action they intend to take to correct the non-conforming work. Written responses from the General Contractor are not considered to be RFI's.
- D. Project Communications: Routine written communications between the Architect and General Contractor shall be in writing, field memo, or e-mail. Such communications shall not be identified as RFI's.

1.4 PROCEDURES

- A. Notification by General Contractor:
 - 1. Submit all requests for clarification of additional information in PDF format to the Construction Manager using form approved by the Construction Manager and Architect.
 - 2. Number RFI sequentially. Follow RFI number with sequential alphabetical suffix as necessary for each resubmission. For example, the first RFI would be "1"; the second would be "2". The first resubmittal of RFI "2" would be "2a", etc.
 - 3. Limit each RFI to one subject.
 - 4. Submit an RFI if one of the following conditions occurs:

- a. The General Contractor discovers an unforeseen condition or circumstance that is not described in the Contract Documents.
 - b. The General Contractor discovers an apparent conflict or discrepancy between portions of the Contract Documents that appears to be inconsistent or cannot be reasonably inferred from the intent of the Contract Documents.
 - c. The General Contractor discovers what appears to be omission from the Contract Documents that cannot be reasonably inferred from the intent of the Contract Documents.
5. RFI's will not be recognized or accepted if, in the opinion of Architect, one of the following conditions exists:
- a. The General Contractor submits the RFI under pretense of a Contract Documents discrepancy or omission without thorough review of the Contract Documents.
 - b. The General Contractor submits the RFI in a manner that suggests that specific portions of the Contract Documents are assumed to be excluded or by taking an isolated portion of the Contract Documents in part rather than whole.
 - c. The General Contractor submits an RFI in an untimely manner without proper coordination and scheduling of Work of related trades.
6. Ask for any clarification or request for interpretation immediately upon discovery. Submit RFIs in a reasonable time frame so as not to affect the Contract Schedule while allowing the full response time specified below.

1.5 RESPONSE TIME

- A. The Architect, whose decision will be final and conclusive, will resolve such questions and issue instructions to the General Contractor through the Construction Manager within a reasonable time frame. In most cases, RFIs will receive a response within 10 working days. In some cases, this time may need to be lengthened for complex issues, or shortened for emergency situations, as mutually agreed in writing.
- B. Should the General Contractor proceed with the work affected before receipt of a response from the Architect within the response time specified above, any portion of the work that is not done in accordance with the Architect's clarifications, instructions, or decisions is subject to removal or replacement and the General Contractor shall be responsible for all resultant losses.

END OF SECTION 01 26 15

GENERAL

1.1 SUMMARY

- A. Provide a schedule of values for the Work.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SCHEDULE

- A. Prepare a schedule which details the amounts allocated to each Section of the Work. The schedule shall total to the agreed Contract sum.
- B. The Schedule of Values shall be consistent with the Construction Schedule.

1.4 SUBMITTALS

- A. Prior to first application for payment, submit a proposed schedule of values to the Architect.
- B. Meet with the Construction Manager and determine additional data, if any, required to be submitted. Secure the Construction Manager's approval of the schedule of values prior to submitting first application for payment.

END OF SECTION 01 29 73

GENERAL

1.1 SUMMARY

- A. The Construction Manager will conduct project meetings throughout the construction period.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.
- B. The Contractor's relations with his subcontractors and materials suppliers, and discussions relative thereto, are the Contractor's responsibility and are not part of project meetings content.

EXECUTION

3.1 PRECONSTRUCTION MEETING

- A. Preconstruction Meeting will be scheduled to be held within 15 working days after the Owner has issued the Notice to Proceed.
- B. Provide attendance by authorized representatives of the Contractor and major subcontractors. The Construction Manager will advise other interested parties, including the Owner and the Architect, and request their attendance.
- C. The Architect will coordinate with the Construction Manager, Contractor, and Owner to establish the agenda.

3.2 MEETING SCHEDULE AND LOCATION

- A. Project meetings will be held every other week, unless otherwise determined by the parties. A mutually acceptable schedule for meetings will be determined at the pre-construction meeting.
- B. Meetings will be held at the project site.

3.3 MEETING AGENDA ITEMS AND MINUTES

- A. The Construction Manager shall develop agendas and compile minutes of each project meeting and distribute to Owner, Contractor, and Architect.
- B. Advise the Construction Manager at least 24 hours in advance of project meetings of any changes to the agenda.

3.4 ATTENDANCE

- A. Assign the project superintendent to represent the Contractor at project meetings throughout progress of the Work.
- B. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.

3.5 REVISIONS TO MINUTES

- A. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.

- B. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
- C. Challenge to minutes shall be settled as priority portion of "old business" at the next regularly scheduled meeting.

END OF SECTION 01 31 19

GENERAL

1.1 SUMMARY

- A. Prepare and maintain the schedules and reports described in this Section.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the Contract.

1.3 RELIANCE UPON THE APPROVED SCHEDULE

- A. The construction schedule as approved by the Construction Manager will be an integral part of the Contract and will establish interim completion dates for the various activities under the Contract.
- B. Should any activity not be completed within 15 days after the stated scheduled date, the Owner shall have the right to require the Contractor to expedite completion of the activity by whatever means the Owner deems appropriate and necessary, without additional compensation to the Contractor.
- C. Should any activity be 30 days or more behind schedule, the Owner shall have the right to perform the activity or have the activity performed by whatever method the Owner deems appropriate.
- D. Costs incurred by the Owner in connection with expediting construction activity under this article shall be reimbursed by the Contractor.
- E. It is expressly understood and agreed that failure by the Owner to exercise the option either to order the Contractor to expedite an activity or to expedite the activity by other means shall not be considered to set a precedent for any other activities.

PRODUCTS

2.1 CONSTRUCTION ANALYSIS

- A. Graphically show by Gantt-chart-type schedule the order and interdependence of all activities necessary to complete the Work, and the sequence in which each activity is to be accomplished. Clearly identify the critical path of the project. Individual activities shall be no longer than 15 calendar days.
- B. Include, but not necessarily limit, indicated activities to:
 - 1. Project mobilization.
 - 2. Submittal and approval of Shop Drawings and Samples.
 - 3. Procurement of equipment and critical materials.
 - 4. Fabrication of special material and equipment and its installation and testing.
 - 5. Starting date, duration and completion of each major section of the Work.
 - 6. Final cleanup.
 - 7. Final inspecting and testing.
 - 8. All activities by the Architect that affect progress, required dates for completion, or both, for all and each part of the Work.

EXECUTION

3.1 CONSTRUCTION SCHEDULE

- A. Within 10 days after receipt of Notice to Proceed, complete the construction analysis in preliminary form, meet with the Construction Manager, review contents of the proposed construction schedule, and make all revisions agreed upon. Submit to Construction Manager copies of the baseline construction schedule for approval.
- B. The Construction Schedule shall use calendar days for Project Start and Project Completion milestones. Individual activities may use a "working days" calendar.

3.2 PERIODIC REPORTS

- A. Update the approved construction schedule and submit with the Application for Payment each month. Indicate "actual" progress in percent completion of each activity. Updates shall be shown against the approved baseline schedule. No logic changes shall be made without prior approval from the Construction Manager.
- B. Provide a written summary of changes in the critical path, reasons causing any delays in the schedule, and an explanation of corrective actions taken or proposed.
- C. Make only those revisions to approved construction schedule as are approved in advance by the Construction Manager.

END OF SECTION 01 32 16

GENERAL

1.1 DESCRIPTION

- A. This Section describes the requirements for furnishing photographs depicting work progress.
- B. Furnish photographs of the site construction throughout the progress of the work.
- C. Take photographs on cutoff date for each Application for Payment.
- D. In addition, take photographs at the beginning and completion of the following elements:
 - 1. Excavation
 - 2. Foundations
 - 3. Structural framing
 - 4. Enclosure of building
 - 5. Final completion

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Digital photographs on CD/DVD disk; provide in JPEG format.
- B. Identify each print. List name of Project, phase, orientation of view, date and time of view, name and of photographer, and photographer's numbered identification of exposure.

1.4 TECHNIQUE

- A. Factual presentation with correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

1.5 VIEWS

- A. Take sufficient photographs at each specified time, until Date of Completion.

1.6 POSTING/ DELIVERY OF PHOTOGRAPHS

- A. Post all photographs to project-specific construction management website and provide access for Architect and Construction Manager.

PRODUCTS

Not used

EXECUTION

Not used

END OF SECTION 01 32 33

GENERAL

1.1 SUMMARY

- A. Shop drawing and product data submittals shall be transmitted to Architect in electronic (PDF) format using a website service designed specifically for transmitting submittals between construction team members.
- B. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
- C. The electronic submittal process is not sufficient for color samples, color charts, or physical material samples.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

PRODUCTS

2.1 PRODUCTS

- A. Basis of specification is e-Builder web-based construction management database provided by the Owner.
- B. The Owner may permit the use of a web-based construction management database service provided by the Contractor upon determination that the proposed service meets the requirements of the Project. If approved, the cost of such service shall be paid by the Contractor.
- C. Product Requirements.
 - 1. Independently hosted, web-based system for automated tracking, storage, and distribution of contract submittals, Requests for Information, and other contract related documents. FTP sites, e-mail exchanges, and server-based systems hosted from inside a contractor's office will not be considered and are not acceptable.
 - 2. Utilize 256-bit SSL encryption and hosted at SAS70 Type II compliant data centers.
 - 3. Minimum five years documented experience of use on comparable commercial construction projects. "Comparable commercial construction projects" shall be defined as documented use on a minimum of five hundred governmental, public-entity, or private sector projects each of \$1 million construction value or greater.
 - 4. Minimum five years documented 99.5% website uptime.
 - 5. Unlimited individual user accounts and system access for all project subcontractors, general contractor, owner staff, construction manager, architect, design consultants, and sub-consultants, with no additional fees for those parties to access the system.
 - 6. Separate locations for owner, architect, design consultant, and sub-consultant review comments with contractors restricted from viewing comments until final review or release by owner or primary design consultant.
 - 7. Full version histories and dates of exchanges automatically tracked and available for viewing, searching, and reporting in a linear log format compatible with AIA G712.

8. Functionality to group submittals as required packages and apply forms and review comments to entire package simultaneously.
9. Functionality for integrated online PDF viewing and review, including graphical markups and stamps, for owner, architect, design consultants, sub-consultants, and general contractor without need for additional software purchase.
10. Automatic, configurable e-mail reminders of past due items.
11. Customized, automated PDF form generation for submittals, RFIs and other documents matching standard templates used by owner, design consultants, sub-consultants and general contractor. Documentation and demonstration of automatic form generation using each entity's templates must be submitted as part of any substitution request.
12. Prior to project start, Construction Manager or General Contractor shall create submittal log with all required items from project manual or submittal register. Owner or primary design consultant shall have full control over required items list and access to edit, add, or remove items during project.
13. System vendor shall provide minimum one-hour live web meeting training sessions to contractors, design consultants, sub-consultants, and owner staff prior to project start.
14. System vendor shall make available minimum thirty-minute live web meeting training sessions for subcontractors at least twice weekly for the entire duration of the project.
15. Allowance for scanning and printing services provided by local third-party reprographic vendor to assist with obtaining documents electronically and online print ordering.

EXECUTION

3.1 SUBMITTAL REQUIREMENTS

A. SHOP DRAWINGS

1. Scale and measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.
2. Submit Shop Drawings in the form of PDF electronic files of each sheet.

B. PRODUCT DATA

1. Provide PDF electronic files of required product data submittals.
2. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly show which portions of the contents are being submitted for review.

C. HAZARDOUS MATERIALS SAFETY DATA SHEETS

1. Provide PDF electronic copies of required hazardous materials safety data sheets for each specific material and type.
2. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly show which portions of the contents are being submitted for review.

D. SAMPLES

1. Provide Sample or Samples identical to the precise article proposed to be provided.

2. Submit Samples in the quantity which is required to be returned to the Contractor, plus one which will be retained by the Architect.
3. By prearrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the Work at a location agreed upon by the Architect.

E. MOCK-UPS

1. Provide mock-ups of material applications and fabrications as identified in various sections of this specification. Mock-up shall be provided in the actual material and finish designated for the application. Make modifications and adjustments as required by the Architect

F. COLORS AND PATTERNS

1. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Architect for selection.

3.2 PROCEDURES

- A. The Construction Manager shall establish a project-specific interactive database within construction management website.
- B. Contractor shall upload submittals to project-specific database within construction management website. Contractor shall be responsible for uploading submittals in a timely manner as required to accommodate adequate review and processing of submittals within timeframes required to maintain the construction schedule.
- C. Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer/product, dimensions and coordination of information with other parts of the work.
- D. Architect/Engineer review comments will be uploaded to the project-specific database on the construction management website. Contractor will receive e-mail notice of completed review.
- E. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.

3.3 GROUPING OF SUBMITTALS

- A. Make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
- B. Partial submittals may be rejected as not complying with the provisions of the Contract. The Contractor may be held liable for delays so occasioned.

3.4 TIMING OF SUBMITTALS

- A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.
- B. In scheduling, allow at least ten working days for review by the Architect following the Architect's receipt of the submittal; fifteen working days if the submittal requires review by consultants to the architect (civil, structural, electrical, mechanical engineers, landscape architects, etc.)

3.5 REQUIRED SUBMITTALS

Spec Section		Product Data	Shop Drawings	Samples	Hazardous Materials Safety Sheet	Other
033000	Cast-in-Place Concrete	X	REBAR		ADMIX.	Mix Designs
042113.23	Thin Brick Veneer	X		X	X	
042223	Concrete Unit Masonry	X	REBAR			Certificates
055000	Metal Fabrications	X	X			Weld Cert.
055133	Metal Ladders	X	X			
055213	Pipe and Tube Railings	X	X			
061000	Rough Carpentry	X				
061643	Insulating Sheathing	X	X			
061800	Glu-Laminated Construction	X	X			Calculations
062000	Finish Carpentry	X	X	X		
064100	Architectural Wood Casework	X	X	X		
072100	Thermal Insulation	X				
072719	Weather Barrier	X				
073113	Composition Shingles	X		X		
074646	Mineral Fiber Cement Siding	X		X		
075419	Single Ply Membrane Roofing	X	X		X	
076200	Sheet Metal Flashings and Trim	X	X			
078413	Penetration Firestopping	X				
079200	Joint Sealants	X		X		
081113	Hollow Metal Doors and Frames	X	X			
081373	Aluminum-Wood Multi-Slide Doors	X	X	X		
081416.13	Wood Door Frames	X				
081433	Stile and Rail Wood Doors	X	X			
083200	Special Function Doors	X	X			
085213	Aluminum Clad Wood Windows	X		X		
087100	Door Hardware	X				Schedule
087113	Automatic Door Operators	X				
089000	Louvers and Vents	X	X			
092900	Gypsum Board	X		TEXTURE	X	
093000	Tiling	X		X		
095113	Suspended Acoustical Ceilings	X	X	X		
095426	Linear Wood Ceiling System	X	X	X		
096519	Resilient Tile Flooring	X		X	X	
096813	Tile Carpeting	X		X	X	
097220	Fiberglass Reinforced Panels	X		X	X	
099100	Painting and Coating	X		BRUSH-OUTS	X	
101116	Marker Boards and Tackboards	X				
101146	Linoleum Bulletin Board	X		X		
101400	Signage	X	X	X		
102113	Toilet Compartments	X	X	X		
102800	Toilet Accessories	X				
103100	Manufactured Fireplaces	X	X			

Spec Section		Product Data	Shop Drawings	Samples	Hazardous Materials Safety Sheet	Other
104413	Fire Extinguishers and Cabinets	X				
113100	Kitchen Appliances	X				
115100	Library Equipment	X	X			
122413	Roller Window Shades	X	X	X		
129300	Site Furnishings	X				
211000	Water-Based Fire Suppression Systems	X	X			Hydraulic Calculations
220000	Plumbing	X				
230000	Heating, Ventilating and Air Conditioning	X				
260000	Electrical	X				
283000	Fire Detection and Alarm	X	X			Battery Calculations
312200	Excavating, Filling, Compacting and Grading	X				
312333	Trenching, Backfilling and Compacting	X				
321216	Asphalt Paving	X				Mix Design
321313	Concrete Paving	X				Mix Design
321416	Brick Pavers	X		X		
321540	Decomposed Granite	X				
328400	Planting Irrigation	X				
329000	Planting	X				
334100	Piped Utility Materials	X				
334113	Storm Drainage	X				

END OF SECTION 01 33 23 .21

GENERAL

1.1 SUMMARY

- A. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- B. Abbreviations and Acronyms: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) www.aluminum.org	(703) 358-2960
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
ACCA	Air Conditioning Contractors of America www.acca.org	(703) 575-4477
ACI	American Concrete Institute/ACI International www.concrete.org	(248) 848-3700
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AHA	American Hardboard Association www.domensino.com	(847) 934-8800
AI	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AISC	American Institute of Steel Construction, Inc. www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559
ALSC	American Lumber Standard Committee www.alsc.org	(301) 972-1700
ANSI	American National Standards Institute	(202) 293-8020

	www.ansi.org	
APA	APA-The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989
ARB	California Air Resources Board www.arb.ca.gov	(800) 242-4450
ARI	Air-Conditioning & Refrigeration Institute www.ahrinet.org	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	(202) 207-0917
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300 (Inter.)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763
ASTM	ASTM International www.astm.org	(610) 832-9500
AWCI	AWCI International (Association of the Wall and Ceiling Industries International) www.awci.org	(703) 538-1600
AWI	Architectural Woodwork Institute www.awinet.org	(571) 323-3636
AWPA	American Wood-Preservers' Association www.awpa.com	(205) 733-4077
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
BHMA	Builders Hardware Manufacturers Association http://www.buildershardware.com	(212) 297-2122
BICSI	BICSI www.bicsi.org	(813) 979-1991
BSC	California Building Standards Commission www.bsc.ca.gov	(916) 263-0916

CalRecycle	California Department of Resources Recycling and Recovery www.calrecycle.ca.gov	(916) 322-4027
CCC	Carpet Cushion Council www.carpetcushion.org	(610) 527-3880
CCR	California Code of Regulations www.oal.ca.gov	(916) 323-6225
CDA	Copper Development Association Inc. www.copper.org	(212) 251-7200
CDPH	California Department of Public Health www.cdph.ca.gov	(916) 558-1784
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(404) 622-0073
CRI	Carpet and Rug Institute (The) www.carpet-rug.org	(706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSA	Canadian Standards Association www.csa.ca	1-800-463-6727
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 820-7700
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
DSA	California Division of the State Architect www.dgs.ca.gov	(916) 376-5000
EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EPA	U.S. Environmental Protection Agency www.epa.gov	(202) 564-7076
FS	Federal Specification Available from Department of Defense Single Stock Point www.dodssp.daps.dla.mil	(215) 697-6257
FS (con't)	Available from General Services Administration	(202) 619-8925

	www.gsa.gov	
FS (con't)	Available from National Institute of Building Sciences www.nibs.org	(202) 289-7800
FSC	Forest Stewardship Council www.fsc.org	(612) 353-4511
GA	Gypsum Association www.gypsum.org	(301) 277-8686
GANA	Glass Association of North America www.glasswebsite.com	(785) 271-0208
HCD	Department of Housing and Community Development www.hcd.ca.gov	(916) 445-4782
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
IAMPO	International Association of Plumbing and Mechanical Officials www.iapmo.org	(909) 472-4100
ICC	International Code Council www.iccsafe.org	(888) 422-7233
IGCC	Insulating Glass Certification Council www.igcc.org	(315) 646-2234
IGMA	Insulating Glass Manufacturers Alliance (The) www.igmaonline.org	(613) 233-1510
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com	(812) 275-4426
ISSFA	International Solid Surface Fabricators Association www.issfa.net	(887) 464-7732
KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MFMA	Maple Flooring Manufacturers Association www.maplefloor.org	(888) 480-9138
MFMA	Metal Framing Manufacturers Association www.metalframingmfg.org	(312) 644-6610
MIA	Marble Institute of America www.marble-institute.com	(440) 250-9222
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937

NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NFPA	National Fire Protection Association www.nfpa.org	(617) 770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-1776
NLGA	National Lumber Grades Authority www.nlga.org	(604) 584-2393
NOFMA	National Wood Flooring Manufacturers Association www.nofma.org	(800) 422-4556
NRCA	National Roofing Contractors Association www.nrca.net	(847) 299-9070
NWWDA NSF	National Wood Window and Door Association (See WDMA) National Sanitation Foundation www.nsf.org	(800) 673-6275
ODHPD	Office of Statewide Health Planning and Development www.oshpd.ca.gov	(916) 326-3600
OSHA	Occupational Safety and Health Act www.osha.gov	800-321-6742
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting and Decorating Contractors of America www.pdca.com	(800) 332-7322 (314) 514-7322
RCSC	Research Council on Structural Connections c/o AISC www.boltcouncil.org	
SAE	SAE International www.sae.org	(724) 776-4841 (724) 776-4960 Publications
SCAQMD	South Coast Air Quality Management District www.aqmd.gov	(909) 396-2000

SCS	Scientific Certifications Systems www.scscertified.com	(800) 326-3228
SDI	Steel Deck Institute www.sdi.org	(847) 458-4647
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SJI	Steel Joist Institute www.steeljoist.org	(843) 407-4091
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPRI	Single Ply Roofing Institute www.spri.org	(781) 647-7026
SSPC	The Society for Protective Coatings www.sspc.org	(412) 281-2331 (877) 281-7772
TABB	Testing, Adjusting and Balancing Bureau www.tabbcertified.org	(703) 739-7100
TCA	Tile Council of America, Inc. www.tileusa.com	(864) 646-8453
TIA	Telecommunications Industry Association www.tiaonline.org	(703)-907-7700
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
TPI	Truss Plate Institute, Inc. www.tpinst.org	(703) 683-1010
UL	Underwriters Laboratories Inc. www.ul.com	(877) 854-3577
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association http://www.wcmanet.org	(212) 297-2122
WCSC	Window Covering Safety Council www.windowcoverings.org	(212) 297-2100

WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California) www.woodworkinstitute.com	(916) 372-9943
WIC	Woodwork Institute of California (See WI)	
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WWPA	Western Wood Products Association www2.wwpa.org	(503) 224-3930

END OF SECTION 01 42 00

GENERAL

1.1 SUMMARY

- A. Provide for testing, as required by Owner, to determine that materials provided for the Work meet the specified requirements.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 QUALITY ASSURANCE

- A. The Owner will select a pre-qualified independent testing laboratory. Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

1.4 PRODUCT HANDLING

- A. Promptly process and distribute all required copies of test reports and related instructions to ensure all necessary retesting and/or replacement of materials with the least possible delay in progress of the Work.

PRODUCTS

2.1 PAYMENT FOR TESTING SERVICES

- A. The Owner will pay for all initial testing services requested by the Owner. When initial tests indicate non-compliance with the Contract Documents, all subsequent retesting occasioned by the non-compliance shall be performed by the same testing laboratory and the costs thereof will be paid for by the Contractor.
- B. Special Inspections and tests required by codes, ordinances, or by a plan approval authority shall be the responsibility of Contractor. The Contractor shall utilize the testing services firm retained by the Owner and testing shall be paid for by the Owner unless otherwise provided in the Contract Documents.
- C. When initial tests indicate non-compliance with the Contract Documents, all subsequent retesting occasioned by the non-compliance shall be performed by the same testing laboratory and the costs thereof will be paid for by the Contractor.
- D. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

EXECUTION

3.1 COOPERATION WITH TESTING LABORATORY

- A. Representatives of the testing laboratory shall have access to the Work at all times. Provide facilities for such access in order that the laboratory may properly perform its functions.

3.2 SCHEDULES FOR TESTING

- A. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.

- B. Provide all required time within the construction schedule.
- C. When changes of construction schedule are necessary during construction, coordinate all such changes of schedule with the testing laboratory as required.
- D. When the testing laboratory is ready to test according to the determined schedule but is prevented from testing or taking specimens due to incompleteness of the Work, all extra costs for testing attributable to the delay may be backcharged to the Contractor and shall not be borne by the Owner,

3.3 TAKING SPECIMENS

- A. All specimens and samples for testing, unless otherwise provided in these Contract Documents, will be taken by the testing laboratory; all sampling equipment and personnel will be provided by the testing laboratory; and all deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

END OF SECTION 01 45 23

GENERAL

1.1 SUMMARY

- A. This Section describes construction facilities and temporary controls.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 USE CHARGES

- A. Cost or use charges for temporary facilities shall be included in the Contract Sum.

EXECUTION

3.1 TEMPORARY UTILITIES

- A. General: Arrange with utility company, Owner and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water: Provide necessary temporary piping and water supply.
- C. Electricity: Provide necessary temporary wiring and distribution boxes to obtain power and lighting at points where needed for work, inspection and safety.
- D. Heating: Provide and maintain heat necessary for proper conduct of operations.
- E. Telephone and Internet Access: Make necessary arrangements for installation and operation of access for internet service to the Contractor's office at the site. Contractor shall provide a dedicated cellular phone service for the project superintendent.

3.2 FIELD OFFICES

- A. Provide a field office building(s) for Contractor's offices, supply and storage. Provide and equip enclosed space adequate for holding project meetings.

3.3 SANITARY FACILITIES

- A. 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.

3.4 TEMPORARY SECURITY AND PROTECTION FACILITIES

- A. Provide temporary environmental protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway and subsoil contamination or pollution or other undesirable effects.
- B. Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- C. Provide temporary enclosures for protection of construction and workers from inclement weather and for containment of heat.
- D. Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

- E. Enclosures: Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.
- F. Install and maintain temporary fire-protection facilities. Comply with NFPA 241.

3.5 TEMPORARY FENCING

- A. Provide and maintain for the duration of construction a temporary fence of design and type needed to prevent people and animals from easily entering the site except by entrance gates.

3.6 PROJECT SIGNS

- A. Within 15 days of the "Notice to Proceed", fabricate and install the job sign on the site as shown on the Drawings.
- B. Contractor shall include the cost of temporary project sign fabrication and installation in the Contract.
- C. Sign shall be $\frac{3}{4}$ " min. 48" x 96" exterior A/C plywood mounted to 4x4 PT wood posts embedded 36" min. into ground or mounted on and braced to lumber skids. Height of sign shall be 72" above grade. All exposed wood shall be painted white with 2-coats gloss enamel. Sign face shall be professionally printed and included, at a minimum, the name of the project, architect, contractor, Yolo County Library logo, and the County of Yolo seal. Architect will provide digital artwork for sign after award of contract.
- D. Contractor shall coordinate location of temporary construction sign with County Project Manager.
- E. Upon completion of the Work, demount the job sign and return to the Owner at his direction.

3.7 MAINTENANCE

- A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.

3.8 TERMINATION AND REMOVAL

- A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary services to use of permanent service.
- B. Remove temporary facilities and controls no later than substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

3.9 CONSTRUCTION-PHASE CONTROLS TO MITIGATE POTENTIAL ENVIRONMENTAL IMPACTS

- A. Cultural Resources, Tribal Cultural Resources, and Human Remains
 1. To ensure appropriate construction crews and personnel are aware of the potential for the New Yolo Branch Library Building Project to encounter unrecorded cultural resources (i.e., historical, archaeological, and paleontological resources), tribal cultural resources, and/or human remains, all construction personnel involved in supervising or performing ground disturbing activities (site clearing, excavation work, grading, and trenching) shall participate in pre-construction training provided by the County.
 2. All ground disturbing activities (site clearing, excavation work, grading, and trenching) shall be monitored by an archeologist and/or tribal representative retained by the County. The Contractor shall accommodate monitors onsite and coordinate timing of subject construction activities with the County Project Manager.

3. To reduce the potential for equipment to inadvertently adversely affect unrecorded cultural resources and tribal cultural resources, all excavating machinery shall use toothless buckets during ground disturbing activities (site clearing, excavation work, grading, and trenching).
 4. In the event that unrecorded cultural resources, tribal cultural resources, or human remains are discovered, ground disturbing activities shall cease immediately, and the Contractor shall notify the County Project Manager or onsite cultural monitor. Ground disturbing construction activities shall not resume until authorized by the County Project Manager.
- B. During construction activities, Contractor will be required to abide by Mitigation Measure AIR-1A (Reduce Fugitive Dust Emissions) established in the Project Environmental Impact Report. Contractor will be held to the strictest requirements of those found elsewhere in the Contract Documents and those described below.
1. Water all exposed surfaces (e.g., staging areas, soil piles, graded areas, and unpaved access roads) two times per day during construction and adequately wet demolition surfaces to limit visible dust emissions.
 2. Cover or maintain at least two feet of freeboard for all haul trucks transporting soil, sand, or other loose materials off the project site.
 3. Sweep streets if visible soil material is carried out from the construction site.
 4. Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut-and-fill operations and hydroseed area.
 5. Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
 6. Minimize idling time of diesel-powered construction equipment to five minutes and post signs reminding workers of this idling restriction at access points and equipment staging areas during construction of the proposed project.
- C. During construction activities, Contractor will be required to abide by Mitigation Measure HAZ-1A (Minimize and Avoid Impacts from Unanticipated Hazardous Materials) established in the Project Environmental Impact Report. Contractor will be held to the strictest requirements of those found elsewhere in the Contract Documents and those described below.
1. In the event unanticipated contamination or hazardous materials are discovered during project construction (e.g., gasoline odors, or oily soil or water), the Contractor shall:
 - a. Stop all work immediately, contact the Department of Environmental Health, and take appropriate investigative and/or remedial action to adequately characterize the contamination and ensure the release or potential release of hazardous materials would not pose a significant threat to human health and/or the environment.
 - b. Construction may proceed if, after coordinating with the Department of Environmental Health, it is determined activities would not affect the release or potential release of a hazardous material.
- D. During construction activities, Contractor will be required to abide by Mitigation Measure HAZ-1D (Minimize and Avoid Impacts from Equipment Leaks and Spills) established in the Project Environmental Impact Report. Contractor will be held to the strictest requirements of those found elsewhere in the Contract Documents and those described below.

1. The Contractor shall minimize and avoid potential leaks and spills from heavy construction equipment used during demolition, site preparation, and building construction activities by:
 - a. Designating vehicle and equipment storage, staging, and clean-up locations.
 - b. Designating equipment fueling locations and ensuring appropriate spill containment measures and spill response equipment is on-site.
 - c. Inspecting equipment for leaks prior to and at the conclusion of daily construction activities. If leaks are observed, the leaking equipment shall be repaired immediately. All contaminated water, sludge, spill residue, or other hazardous compounds discovered during inspections shall be contained and disposed of, as necessary, at lawfully permitted or authorized disposal sites.
- E. During construction activities, Contractor will be required to abide by Mitigation Measure NOI-1A (Reduce Potential Temporary Construction Noise Impacts) established in the Project Environmental Impact Report. Contractor will be held to the strictest requirements of those found elsewhere in the Contract Documents and those described below.
 1. Construction deliveries and construction activities shall be restricted to the hours of 7:00 AM to 6:00 PM, Monday through Friday and 9:00 AM to 6:00 PM on Saturday. Construction activities on Sunday shall be prohibited.
 2. Provide electrical hook-up to the construction site and prohibit the use of diesel-powered generators to the extent it is logistically and technically feasible to do so.
 3. Impact tools such as jack hammers shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. When use of pneumatic tools is unavoidable, they shall include a noise suppression device on the compressed air exhaust.
- F. During construction activities, Contractor will be required to abide by Mitigation Measure NOI-1B (Reduce Potential Temporary Construction Vibration Impacts) established in the Project Environmental Impact Report. Contractor will be held to the strictest requirements of those found elsewhere in the Bid Documents and those described below.
 1. The operation of vibratory rollers, plate compactors, and other large compaction equipment shall be prohibited within 15 feet of all adjacent residential structures.
 2. If it is not feasible to avoid the operation of large compaction equipment within 15 feet of adjacent residential structures, the Contractor shall develop and implement a Vibration Mitigation Plan that identifies the vibration control measures to ensure construction does not damage any adjacent residential structure. Such measures may include the use of before and after photos, vibration monitoring, barriers, pre-compaction activities, use of smaller equipment, or other measures that limit groundborne vibration to levels that would not result in structural damage (approximately 0.5 inches per second peak particle velocity).
- G. Contractor is advised that the County has obligations under the Mitigation Monitoring and Reporting Program established by the Project Environmental Impact Report to perform a nesting bird and roosting bat survey onsite prior to start of construction and to ensure proper monitoring of site.
 1. Contractor shall not begin work onsite until County has performed survey and informed Contractor that construction may proceed.
 2. County will pay for biological survey.

3. Due to restrictions established by the California Department of Public Health, direct contact by workers with any bat is not allowed. The Contractor shall notify the County Project Manager immediately if a bat or bat roost is discovered or encountered during project construction.

END OF SECTION 01 50 00

GENERAL

1.1 SUMMARY

- A. This Section specifies preservation of existing trees and plants, including pruning, protective barriers and irrigation during building demolition, site work and building construction.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 PERFORMANCE REQUIREMENTS

- A. Do not allow trees and plants to be cut, broken, skinned, bark bruised or roots damaged.
- B. Do not alter earth surface within drip lines of trees or plants.

1.4 SEQUENCE

- A. Install temporary fencing before any other work is performed in the area of existing trees or plants.

1.5 SPECIAL WARRANTY

- A. Remove and replace trees or plants which subsequently die and which are neglected or injured during the Contract time. Replace with approved 24-inch box specimen. Replant and provide 3-year care and maintenance contract for new tree.
- B. Provide 3-year care and maintenance contract for trees with broken limbs, bruised bark, portions skinned or showing root damaged because of construction activities.

1.6 MAINTENANCE

- A. Irrigate on a regular basis with potable water to maintain trees and plants in good health.

PRODUCTS

2.1 MATERIALS

- A. Barricades:
 - 1. Fabric: 6-foot high utility, snow type fencing consisting of 2-inch wood lath woven between 7 double strands of galvanized wire. Spaces between lath shall be 2-inch maximum.
 - 2. Posts: As required to keep fabric upright and in fixed position during construction.
- B. Tree Seal: Antibacterial fungicide of waterproof composition specifically manufactured for use in pruning plants.

EXECUTION

3.1 PREPARATION

- A. Do not permit excavation or drilling equipment to disturb roots 2-inches or larger in diameter.
- B. Determine limbs and roots that must be cut. In company with Architect, clearly mark limbs to designate approved point of cutting.

3.2 INSTALLATION

A. Barricades:

1. Install to encircle all trees to remain.
2. Set at drip line.
3. Set posts by hand. Locate roots by hand probing. Space posts approximately 4-feet apart and securely attach fabric.
4. Maintain during construction and remove upon completion of work.

B. Pruning:

1. Cut evenly and produce at neat severance. Do not tear bark or fracture limbs.
2. Promptly coat cut ends of limbs and roots larger than 2-inch caliper with tree seal.
3. Apply wet burlap to root ends after cutting roots larger than 2-inch caliper.

3.3 REPAIR

- A. Prune and treat damaged areas as directed by the Architect.
- B. Coat scars over 2-inches with tree seal.

END OF SECTION 01 56 39

GENERAL

1.1 SUMMARY

- A. Provide storage and protection for all products scheduled for use in the Work.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 MANUFACTURERS' RECOMMENDATIONS

- A. Determine and comply with manufacturers' recommendations on product handling, storage and protection for all products.

1.4 PACKAGING

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible. Maintain packaged materials with seals unbroken and labels intact until time of use.
- B. Promptly remove damaged material and unsuitable items from the job site. Promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
- C. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality and other pertinent information.

1.5 PROTECTION

- A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.
- B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.
- C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.6 STORAGE

- A. Keep all construction materials subject to moisture damage under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber, plywood, sheet rock and other panels; provide for air circulation within and around stacks and under temporary coverings.

1.7 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacements and repairs to the approval of the Architect and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

END OF SECTION 01 66 00

GENERAL

1.1 SUMMARY

- A. This Section describes the requirements for maintaining records of actual conditions in the field and for changes in the work as contained on the As-Built drawings and transcribed to become the Record Documents.
- B. The purpose of final Project Record Documents is to provide factual information regarding all aspects of the work, both concealed and visible, to enable future modifications of the work to proceed without lengthy and expensive site measurement, investigation, and examination.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

EXECUTION

3.1 DOCUMENTS REQUIRED

- A. Maintain at the site the following record documents to be turned over to the Owner upon request for Substantial Completion.
 - 1. Drawings.
 - 2. Specifications.
 - 3. Change Orders and other modifications to the Contract.
 - 4. Field Instructions and other written instructions from the Architect.
 - 5. Reviewed shop drawings, product data, and samples or access on computer to all submittal documents and tracking.
 - 6. Test reports.
 - 7. Requests for Information.
 - 8. Claims.
 - 9. Training.

3.2 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store record documents and samples in Contractor's field office apart from documents used for construction.
 - 1. Provide files and racks for storage of documents.
 - 2. Provide locked cabinets or secure storage space for storage of samples.
- B. File documents and samples in a manner acceptable to the Architect.
- C. Make documents and samples available at all times for inspection by the Architect.
- D. Update the document within 24 hours after receiving information that a change has occurred or clarification has been issued.

3.3 RECORDING

- A. Label each document "AS BUILT PROJECT RECORD" in neat, large printed letters.
- B. Record information concurrently with the construction process.
 - 1. Do not conceal any work until required information is recorded.
 - 2. Completely, accurately, and legibly record, to the satisfaction of the Architect, all deviations in construction, especially pipe and conduit locations, and any deviations caused by approved changes and/or clarifications to the work.
 - 3. Use additional copies of prints, if necessary, to insure legible recording of data.
 - 4. Date all entries.
 - 5. Call attention to the entry by drawing a "cloud" around the area affected.
 - 6. In the event of overlapping changes, use different colors for each change.
- C. Legibly mark drawings to record actual construction.
 - 1. Depths of various elements of foundation in relation to finish first floor datum.
 - 2. Horizontal and vertical locations of underground utilities and appurtenances referenced to permit surface improvements.
 - 3. Locations of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 - 4. Field changes of dimension and detail.
 - 5. Changes made reflecting approved changes to the work.
 - 6. Details not on original Contract Drawings.
- D. Legibly mark each Section of the Specifications to record.
 - 1. Manufacturer's trade name, catalog number, and supplier of each product and item of equipment installed.
 - 2. Changes made reflecting approved changes to the work.
- E. Maintain shop drawings as record drawings. Legibly annotate shop drawings to record changes made after approval.
- F. Prior to submitting each request for payment, secure approval from the Architect of the current status of record documents.
- G. Periodic payments or portions thereof to the Contractor may be withheld until the Architect verifies that all as-built information to date has been properly recorded on project record documents.

3.4 CONVERSION OF COORDINATING DRAWINGS AND SCHEMATIC LAYOUTS

- A. The drawings, arrangements of conduits, circuits, piping, ducts, and similar items are shown schematically and are not intended to portray precise physical layout. The final physical arrangement is determined by the Contractor, subject to the approval of the Architect, and shall be accurately recorded by the Contractor on the record documents.
- B. Show on the job set of record drawings, by dimension accurate to one inch, the centerline of each run of all items specified in the preceding paragraph.
 - 1. Clearly identify the item by accurate note such as "cast iron drain" or "galvanized flashing", etc.
 - 2. Show by symbol or note the vertical location of the item ("6 inches below slab", "in ceiling plenum", "exposed", etc.).

3. Make identification sufficiently descriptive that it may be related reliably to the Specifications.

3.5 FINAL PROJECT RECORD DOCUMENTS

- A. At a time nearing Substantial Completion of the work, obtain from the Architect through the Construction Manager one set of bond reproduces of the contract documents. The Contractor will complete the As-Built prints.
- B. Obtain approval from the Project Inspector of all data recorded on the As-Built set of prints.
- C. After Substantial Completion, carefully transfer all data shown on the job set of As-Built Record Drawings to the corresponding reproduces, coordinating the information as required.
- D. Clearly indicate at each affected detail and other drawings a fully description of changes made during construction, and the actual location of items as previously specified.
- E. "Cloud" all affected areas.
- F. Stamp each record drawing with the following information:
 1. Project Record Document.
 2. Prepared by: Contractor's name, permanent address.
 3. Date prepared.
 4. Contractor's signature.

3.6 SUBMITTALS

- A. Submit the complete set of As-Built Project Record Documents to the Owner upon request for Substantial Completion.
- B. Participate in review meetings with the Owner and the Architect as required.
- C. Make the required changes and promptly deliver the final Project Record Documents on the reproduces to the Architect.

3.7 DEMONSTRATION AND TRAINING

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate and maintain systems, subsystems and equipment not part of a system. Include a detailed review of the following:
 1. Include instruction for basis of system design and operational requirements, review of documentation, emergency procedures, operations, adjustments, troubleshooting, maintenance and repairs.

END OF SECTION 01 70 00

GENERAL

1.1 SUMMARY

- A. Through the construction period, maintain the building and site in a standard of cleanliness as described in this Section. Thoroughly clean all work prior to final acceptance.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

- A. Provide all required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

- A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

2.3 WASTE-COLLECTION CONTAINERS

- A. Provide waste-collection containers in sizes adequate to handle waste from construction operations. When containers are full, legally dispose of waste off-site. Comply with requirements of authorities having jurisdiction.

2.4 WASTE MANAGEMENT COMPLIANCE

- A. Contractor shall develop a Construction Waste Management Plan in compliance with Specification Section 01 74 19 "Construction Waste Management and Disposal".

EXECUTION

3.1 PROGRESS CLEANING

- A. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.
- B. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the ecology.
- C. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
- D. Daily, and more often if necessary, inspect the structures and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.
- E. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
- F. Weekly, and more often if necessary, sweep all interior spaces clean. "Clean" will be interpreted as meaning free from dust and other material capable of being removed by reasonable diligence using a hand-held broom.

- G. As required preparatory to installation of succeeding material, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material.
- H. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials have been installed. "Clean" will be interpreted as meaning free from all foreign material which may be injurious to the finish floor material.

3.2 FINAL CLEANING

- A. Except as otherwise specifically provided, "clean" will be interpreted as meaning the level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.
- B. Prior to completion of the work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste.
- C. Hose down all paved areas on the site and all public sidewalks directly adjacent to the site. Completely remove all resultant debris.
- D. Structures:
 - 1. Visually inspect all exterior surfaces and remove all traces of soil, waste material, smudges, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. If necessary to achieve a uniform degree of exterior cleanliness, hose down the exterior of the structure. In the event of stubborn stains not removable with water, the Architect may require light sandblasting or other cleaning at no additional cost to the Owner.
 - 2. Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint drippings, spots, stains, and dirt from finished surfaces. Use only the specified cleaning materials and equipment.
- E. Schedule final cleaning as approved by the Architect to provide a completely clean project.

3.3 CLEANING DURING OWNER'S OCCUPANCY

- A. Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for the interim and final cleaning of the occupied spaces shall be as determined by the Architect in accordance with the General Conditions of the Contract.

END OF SECTION 01 74 00

GENERAL

1.1 SUMMARY

- A. Divert Construction and demolition debris from disposal in landfill by recycling and salvaging at least 50% of non-hazardous construction and demolition (C&D) or meet local construction and demolition waste management ordinance, whichever is more stringent. Provide construction management plan.
- B. 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

PRODUCTS

2.1 WASTE COLLECTION CONTAINERS

- A. Provide waste collection containers in sizes and types to collect debris.

EXECUTION

3.1 CONSTRUCTION MANAGEMENT PLAN

- A. Contractor shall develop a construction management plan to recycle and salvage at least 50% of non-hazardous debris or meet local construction and demolition waste management ordinance, whichever is more stringent. Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan for approval by the enforcement agency.
- B. Waste Management Plan shall monitor construction waste by volume or weight; but not both. Plan shall monitor all recycled debris and mixed debris.
 - 1. Plan shall identify the materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
 - 2. Plan shall specify whether materials will be sorted on-site or mixed for transportation to a diversion facility.
 - 3. Plan shall identify haulers, recyclers, and the diversion facility or facilities where the material collected will be taken.
 - 4. Plan shall identify construction methods employed to reduce the amount of waste generated.
 - 5. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.
- C. Contractor shall divert 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing for reuse or recycling.
- D. Provide for grinding of all existing asphaltic concrete paving on site to be reused for base rock on site or hauled off site by a paving recycler for grinding and reuse.

- E. Provide separate waste collection containers for mixed debris, waste (landfill), and recycled materials. Materials to be considered for recycling shall include, but not be limited to, cardboard, metal, plastic, clean wood, glass, gypsum wallboard, carpet and insulation.
- F. Designate a particular area on site for collection and sorting of materials.
- G. Co-mingling of recycled debris may be allowed conforming to the local county trash/recycling policy.
- H. Subcontractors may be required by Contractor to recycle their own waste products off site; require subcontractors to provide documentation of recycling by weight or volume.
- I. Regularly remove debris from job site.
- J. At project completion provide documentation log of all construction debris listing volume or weight and percentage calculation.

END OF SECTION 01 74 19

COMPLIANCE FORMS AND WORKSHEETS

Construction Waste Management (CWM) Plan

Note: This sample form may be used to assist in documenting compliance with the waste management plan.

Project Name: _____
Job #: _____
Project Manager: _____
Waste Hauling Company: _____
Contact Name: _____

All Subcontractors shall comply with the project's Construction Waste Management Plan.
All Subcontractor foremen shall sign the CWM Plan Acknowledgment Sheet.

Subcontractors who fail to comply with the Waste Management Plan will be subject to backcharges or withholding of payment, as deemed appropriate. For instance, Subcontractors who contaminate debris boxes that have been designated for a single material type will be subject to backcharge or withheld payment, as deemed appropriate.

1. The project's overall rate of waste diversion will be ____ %.
2. This project shall generate the least amount of waste possible by planning and ordering carefully, following all proper storage and handling procedures to reduce broken and damaged materials and reusing materials whenever possible. The majority of the waste that is generated on this jobsite will be diverted from the landfill and recycled for other use.
3. Spreadsheet 1, enclosed, identifies the waste materials that will be generated on this project, the diversion strategy for each waste type and the anticipated diversion rate.
4. Waste prevention and recycling activities will be discussed at the beginning of weekly subcontractor meetings. As each new subcontractor comes on-site, the WMP Coordinator will present him/her with a copy of the CWM Plan and provide a tour of the jobsite to identify materials to be salvaged and the procedures for handling jobsite debris. All Subcontractor foremen will acknowledge in writing that they have read and will abide by the CWM Plan. Subcontractor Acknowledgment Sheet enclosed. The CWM Plan will be posted at the jobsite trailer.
5. Salvage: Excess materials that cannot be used in the project, nor returned to the vendor, will be offered to site workers, the owner, or donated to charity if feasible.
6. [HAULING COMPANY] will provide a commingled drop box at the jobsite for most of the construction waste. These commingled drop boxes will be taken to [Sorting Facility Name and Location]. The average diversion rate for commingled waste will be ____%. As site conditions permit, additional drop boxes will be used for particular phases of construction (e.g., concrete and wood waste) to ensure the highest waste diversion rate possible.
7. In the event that the waste diversion rate achievable via the strategy described in (6) above, is projected to be lower than what is required, then a strategy of source-separated waste diversion and/or waste stream reduction will be implemented. Source separated waste refers to jobsite waste that is not commingled but is instead allocated to a debris box designated for a single material type, such as clean wood or metal.

Notes:

1. Waste stream reduction refers to efforts taken by the builder to reduce the amount of waste generated by the project to below four (4) pounds per square foot of building area.
2. When using waste stream reduction measures, the gross weight of the product is subtracted from a base weight of four (4) pounds per square foot of building area. This reduction is considered additional diversion and can be used in the waste reduction percentage calculations.
8. [HAULING COMPANY] will track and calculate the quantity (in tons) of all waste leaving the project and calculate the waste diversion rate for the project. [HAULING COMPANY] will provide Project Manager with an updated monthly report on gross weight hauled and the waste diversion rate being achieved on the project. [HAULING COMPANY]'s monthly report will track separately the gross weights and diversion rates for commingled debris and for each source-separated waste stream leaving the project. In the event that [HAULING COMPANY] does not service any or all of the debris boxes on the project, the [HAULING COMPANY] will work with the responsible parties to track the material type and weight (in tons) in such debris boxes in order to determine waste diversion rates for these materials.
9. In the event that Subcontractors furnish their own debris boxes as part of their scope of work, such Subcontractors shall not be excluded from complying with the CWM Plan and will provide [HAULING COMPANY] weight and waste diversion data for their debris boxes.
10. In the event that site use constraints (such as limited space) restrict the number of debris boxes that can be used for collection of designated waste the project Superintendent will, as deemed appropriate, allocate specific areas onsite where individual material types are to be consolidated. These collection points are not to be contaminated with non-designated waste types.
11. Debris from jobsite office and meeting rooms will be collected by [DISPOSAL SERVICE COMPANY]. [DISPOSAL SERVICE COMPANY] will, at a minimum, recycle office paper, plastic, metal and cardboard.

Construction Waste Management (CWM) Acknowledgment

[illegible]

Construction Waste Management (CWM) Acknowledgment

Project Name: _____

Job Number: _____

Project Manager: _____

Waste Hauling Company: _____

I have read the Waste Management Plan for the project; I understand the goals of this plan and agree to follow the procedures described in this plan.

2010 CALIFORNIA GREEN BUILDING STANDARDS CODE

GENERAL

1.1 SUMMARY

- A. This Section describes the procedure for transfer of the completed Work to the Owner.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBSTANTIAL COMPLETION

- A. Prepare and submit to the Architect the list required by the A 201 General Conditions.
- B. After the Contractor has notified the Architect that all corrections to the contractor list have been completed, the Architect will inspect to determine status of completion. The Architect will prepare a punch list of Work that is not substantially complete and deliver to the Contractor.
- C. Remedy the deficiencies and notify the Architect when ready for re-inspection. The Architect will re-inspect the Work. Work remaining incomplete must be finished prior to Substantial Completion.
- D. When the Architect concurs that the punch list items have been remedied and Work is substantially complete, a "Certificate of Substantial Completion" will be prepared by the Architect, accompanied by the list of items to be completed or corrected prior to final completion.
- E. The Architect will submit the Certificate to the Owner and to the Contractor for their written acceptance.

1.4 FINAL COMPLETION

- A. Prepare and submit notice required by General Conditions. Verify that the Work is complete including, but not necessarily limited to, the items mentioned in the General Conditions. Certify that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected for compliance with the Contract Documents.
 - 3. Work has been completed in accordance with the Contract Documents.
 - 4. Equipment and systems have been tested as required and are operational.
 - 5. Work is completed and ready for final inspection.
- B. The Architect will make an inspection to verify status of completion. The Architect promptly will so notify the Contractor in writing of remaining deficiencies.
- C. Remedy the deficiencies promptly and notify the Architect when ready for re-inspection.
- D. When the Architect determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.

1.5 CLOSEOUT SUBMITTALS

- A. Closeout submittals include, but are not necessarily limited to:
 - 1. Project Record Documents described in Section 01 70 00.
 - 2. Operation and maintenance data.

3. Warranties and bonds.
 4. Keys and keying schedule.
 5. Spare parts and materials extra stock.
 6. Final lamping plan and schedule including list of manufacturer and model number for all light fixtures.
 7. Evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to, Certificate of Inspection and Certificate of Occupancy.
 8. Certificates of Insurance for products and completed operations.
 9. Evidence of payment and release of liens. List of subcontractors, service organizations, and principal vendors, including names, addresses and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
 10. List of subcontractors, service organizations, and principal vendors, including names, addresses and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
- B. Submit a final statement of accounting to the Architect showing all adjustments to the Contract Sum.

1.6 INSTRUCTION

- A. Instruct the Owner's personnel in proper operation and maintenance of systems, equipment and similar items which were provided as part of the Work. All instruction will be given to the satisfaction of the Architect prior to final payment.

END OF SECTION 01 78 00

GENERAL

1.1 DESCRIPTION

- A. This Section specifies general administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
- B. Refer to the General Conditions for terms of the General Contractor's special warranty of workmanship and materials.
- C. Specific requirements for warranties for the work products and installation that are specified to be warranted, are included in the individual Sections of Divisions 02 through 48.
- D. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- E. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the General Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the General Contractor.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 DEFINITIONS

- A. Standard Product Warranties are pre-printed written warranties published by individual manufactures for particular products and are specifically endorsed by the manufacturer to the Owner.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.
- B. Reinstatement of Warranty: When work covered by a warranty has failed and has been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that work covered by a warranty has failed, replace or rebuild the work to an acceptable condition complying with requirements of Contract Documents. The General Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefited from use of the work through a portion of its anticipated useful service life.
- D. Owners Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
 - E. The Owner reserves the right to refuse to accept work for the Project where a special warranty, certification, or similar commitment is required on such work or part of the work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- 1.5 SUBMITTALS
- A. Submit written warranties to the Construction Manager prior to the date certified for Substantial Completion. If the Architect's Certification of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the work, or a designated portion of the work, submit written warranties upon request of the Architect.
 1. When a designated portion of the work is completed and occupied or used by the Owner, by separate agreement with the General Contractor during the construction period, submit properly executed warranties to the Construction Manager within fifteen days of completion of that designated portion of the work.
 - B. When a special warranty is required to be executed by the General Contractor, or the General Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Construction Manager for approval prior to final execution.
 - C. Form of Submittal: At Final completion, compile two copies of each required warranty and bond properly executed by the General Contractor, or by the General Contractor and a subcontractor, supplier or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - D. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-inch by 11-inch paper.
 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name, of the product, and the name, address and telephone number of the installer.
 2. Identify each binder on the front and the spine with typed or printed title "WARRANTIES AND BONDS", the Project title or name, and the name of the Construction Manager/General Contractor.
 3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PRODUCTS

Not Used.

EXECUTION

Not Used,

END OF SECTION 01 78 36

GENERAL

1.1 SUMMARY

- A. A soil investigation report has been prepared by Wallace Kuhl & Associates, hereinafter referred to as the Soil Engineer. A copy of this report (WKA No. 12406.1P dated September 5, 2019) is included with the Bid Documents.
- B. This report was obtained only for the Owner's use in design and is not a part of the Contract Documents. The report and log of borings is available for contractor's information but is not a warrant of subsurface conditions.

1.2 INCORPORATION OF SOIL INVESTIGATION REPORT RECOMMENDATIONS

- A. Where soils investigation report recommendations have been referenced in the Contract Documents as standards for the performance of work, such recommendations shall be considered part of the Scope of Work under this Contract.

1.3 ADDITIONAL INFORMATION

- A. The Contractor should visit the site and acquaint himself with all existing conditions. Prior to bidding, bidders may make their own subsurface investigations to satisfy themselves as to site and subsurface conditions, but such subsurface investigations shall be performed only under time schedules and arrangements approved in advance by the Architect.

1.4 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

END OF SECTION 02 32 13

GENERAL

1.1 SUMMARY

- A. Demolish and remove from the site those items so indicated on the Drawings

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SECTION REQUIREMENTS

- A. Demolished material shall be considered the property of the Contractor and shall be completely removed from the job site.
- B. Items indicated on the Drawings to be removed and salvaged remain Owner's property. Remove, clean and deliver to Owner's designated storage area.
- C. Comply with EPA regulations and hauling and disposal regulations of authorities having jurisdiction.
- D. It is not expected that hazardous materials will be encountered in the Work. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify the Construction Manager. Owner will remove hazardous materials under a separate contract.

EXECUTION

3.1 EXISTING CONDITIONS

- A. Prior to all work of this Section, examine the areas and conditions under which work will be performed. If conditions detrimental to timely and proper completion of the work exist, notify the Construction Manager. Do not proceed until unsatisfactory conditions are corrected.
- B. Visit the site and verify the extent and location of selective demolition required. Carefully identify limits of selective demolition. Mark interface surfaces as required to enable workmen also to identify items to be removed and items to be left in place intact.
- C. By careful study of the Contract Documents, determine the location and extent of selective demolition to be performed.
- D. The Drawings do not purport to show all objects existing on the site or in the building.

3.2 DEMOLITION

- A. Maintain services / systems indicated to remain and protect them against damage during selective demolition operations. Before proceeding with demolition, provide temporary services / systems that bypass area of selective demolition and that maintain continuity of services / systems to other parts of the building.
- B. Locate, identify, shut off, disconnect and cap off utility services and mechanical / electrical systems serving areas to be selectively demolished.
- C. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

- D. 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 or construction being demolished.
- E. Provide temporary weather protection to prevent water leakage and damage to structure and interior areas.
- F. Protect walls, ceilings, floors and other existing finish work that are to remain. Erect and maintain dustproof partitions. Cover and protect furniture, furnishings and equipment that have not been removed.
- G. Neatly cut openings and holes plumb, square and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
- H. Promptly removed demolished materials from Owner's property and legally dispose of them. Do not burn demolished materials.

3.3 REPLACEMENT

- A. In the event of demolition of items not so scheduled to be demolished, promptly replace such items to the approval of the Architect and at no additional cost to the Owner.

END OF SECTION 02 41 19

GENERAL

- 1.1 SUMMARY:
Provide and install thin brick veneer where shown on the Drawings and specified herein.
- 1.2 GENERAL REQUIREMENTS:
This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.
- 1.3 SUBMITTALS:
Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.
- 1.4 QUALITY ASSURANCE:
- A. Use a subcontractor having not less than two years successful experience in installation of similar products, as approved by the Architect.
 - B. Mock-ups:
 - 1. Prior to other work of this Section, prepare a sample panel of the work of this Section at a location on the site where approved by the Architect.
 - 2. Provide one mock-up panel for each combination of brick pattern, bond pattern, and mortar color.
 - 3. Make each mock-up panel approximately 3'-0" x 4'-0".
 - 4. Show method of bedding, grouting, bond pattern, cleaning and other aspects of the work of this Section to the quality specified.
 - 5. Make necessary adjustments in the mock-up panels and secure the Architect's approval.
 - 6. The mock-up panels, when approved by the Architect, will be used as datum points for comparison with the remainder of the installation for the purpose of acceptance or rejection.

PRODUCTS

- 2.1 GENERAL:
- A. Provide all materials comprising a complete system equal to, but not necessarily limited to, the following:
 - 1. Thin brick - H. C. Muddox Company, color per drawings with integral corner pieces.
 - 2. Non-sagging Adhesive— Latacrete 253 R Gold Rapid Adhesive meeting ANSI A118.4 or equal.
 - 3. Grout – Latacrete SpectraLock Pro or equal. Color to be selected from manufacturer's standard color line.

EXECUTION

- 3.1 PREPARATION:
- A. Prior to commencing the installation, the Contractor shall examine the areas to be covered and advise the General Contractor and Architect of any existing conditions or surface

contamination which will require correction before the work commences.

- B. Before starting, surface to be covered shall be cleaned to remove soil, mortar, etc.
- C. Dry or dusty concrete or masonry surfaces shall be wet down or washed and excess water removed just prior to the application of thin brick.

3.2 INSTALLATION BY THIN BED METHOD:

- A. The Laticrete mortar shall be applied with a notched trowel using a scraping motion to work the material into good contact with the surface to be covered. A trowel having notches approximately 1/4" x 1/4" (6 mm x 6mm) is recommended for thin brick; 1/4" x 3/8" (6 mm x 10mm) for large brick.
- B. Only as much mortar shall be applied as can be covered within 20-30 minutes, or while surface is still tacky. A small quantity of the mortar shall be troweled onto the back of each piece. Thin brick shall then be set in place and rapped or beaten with a small beating block to insure 100% fill bedding and a true surface. Pieces shall be aligned to show uniform joints and then allowed to set until firm.
- C. Excess mortar shall be cleaned from the surface of the thin brick with a wet cloth or sponge while the mortar is fresh.

3.3 EXPANSION AND CONTROL JOINTS:

Expansion joints shall be installed where thin brick abuts restraining surfaces, such as perimeter walls, curbs, columns, corners, etc.

3.4 GROUTING AND POINTING JOINTS:

- A. Allow the adhesive bond coat to cure minimum of 24 hours or until joints can be filled without displacement of the brick.
- B. Joints shall be filled and pointed with Grout by means of a mortar gun, grout bag or other mortar-to-joint delivery device. Tool joints to a concave (vee or grapevine) profile once they have achieved sufficient hardness (thumbprint hard) .
- C. Joints shall be packed full and free of all voids and pits. (Tool or rake as specified.)
- D. Excess mortar shall be cleaned from the surface with water and a damp sponge as the work progresses, while mortar is fresh and before it hardens.
- E. Hardened grout film or haze shall be removed using Laticrete TC-500 Tile, Grout & Masonry Cleaner per manufacturer's recommendations. CAUTION: DO NOT USE ACID TYPE CLEANERS ON COLORED GROUT JOINTS.

3.5 PROTECTION:

The Contractor shall take precautions to protect the finished work from damage by other trades. Cold Weather Note: The setting of Portland cement mortars is retarded by low temperatures and finished work should be protected for an extended period of time.

END OF SECTION 04 21 13

GENERAL

1.1 SUMMARY:

- A. Provide and install concrete unit masonry as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provision of Section 013323 of these specifications.
- B. Prior to delivery of concrete unit masonry to the job site, deliver to the Architect a letter from the manufacturers of the concrete masonry units certifying that all such concrete masonry units delivered to the job site are in strict conformance with the provisions of this Section of these Specifications.

PRODUCTS

2.1 CONCRETE BLOCKS:

- A. Concrete blocks shall be normal weight, standard tan color split-face modular units to sizes shown as manufactured by Calstone, Basalite, or an equal approved in advance by the Architect in accordance with the provisions of Section 01 25 00 of these Specifications.
- B. Shrinkage of standard concrete blocks shall not exceed the amount recommended in ASTM C-90.
- C. Water content:
 - 1. At the time of delivery to the job site, concrete masonry units shall have a value, in weight of contained water, of not more than 13 – 18 pcf of the fully saturated content for the unit tested.
 - 2. Ship all units from the factory, and store at the job site, with all the necessary protection to prevent increase of water content from rain and other sources.
- D. Certification required by Article 1.3-B of this Section of these Specifications shall show results of tests made not more than twelve months prior to delivery of concrete masonry units to the job site, shall prove compliance with the specified values and shall certify that the mix design, yield per batch, and curing procedures for the units delivered to the job site are equal to those submitted for test.

2.2 MORTAR:

- A. All mortar for concrete block shall conform with ASTM C-270-05a, 1800 psi in 28 days, and shall consist of one part portland cement by volume, ¼ to ½ part hydrated lime, and four parts of damp, loose sand, plus water; color to match concrete block.

2.3 REINFORCEMENT STEEL:

- A. All reinforcement steel required for concrete masonry units shall be the type and quality specified for concrete in Section 033000 of these Specifications.

2.4 GROUT:

- A. All grout should be transit-mixed in accordance with ASTM C-476-02 and shall consist of one part portland cement, 2-1/2 parts sand, two parts pea gravel, and adequate water to produce a concrete with a slump of 8-11 inches, and shall have an ultimate compressive strength of at least 2000 psi in 28 days.
- 2.5 ADMIXTURES FOR GROUT:
 - A. Use Sika Grout Aid, or an equal approved in advance by the Architect, in all grout for high-lift applications, following manufacturer's recommendations as approved by the Architect.
- 2.6 OTHER MATERIALS:
 - A. All Other materials, not specifically described but required for a complete and proper installation of concrete unit masonry, shall be as selected by the Contractor subject to the approval of the Architect.

EXECUTION

- 3.1 MIXING MORTAR:
 - A. Use a mechanical mixer of one sack minimum capacity. Use measuring box for all volume measurements. Mix mortar at least three minutes after all materials have been added.
 - B. Mix only as much mortar as can be used in one hour after water has been first mixed into the batch.
 - C. Do not re-temper mortar.
- 3.2 INSTALLATION:
 - A. General:
 - 1. Lay up all walls in bond to match existing, plumb, level, and true to the lines and dimensions indicated on the Drawings.
 - 2. Do not use chipped or broken units. If any such units are discovered in the finished wall, the Architect may require their immediate removal and replacement with new units at no additional cost to the Owner.
 - B. Dampening:
 - 1. Store all masonry units on the job so that they are kept off the ground and protected from the rain.
 - 2. Wetting the units shall not be permitted except when hot and dry weather exists causing the units to be warm to the touch, and then the surface only may be wetted with a light fog spray.
 - C. Laying up:
 - 1. Place all units in mortar with full shoved bed and head joints.
 - 2. Align all vertical cells to maintain a clear, unobstructed system of flues.
 - 3. Hold racking to an absolute minimum.
 - 4. Provide cleanouts at the bottom of each cell for removing mortar droppings. Do not close the cleanouts until they have been inspected and approved by the Architect.
 - D. Reinforcement:
 - 1. Install all reinforcement as indicated on the drawings.
 - 2. Fully embed reinforcement in grout, not in mortar or mortar joints.

- 3. Furnish and install all required metal accessories to ensure accurate alignment of steel during grout filling operations.
 - E. Tool all joints to a dense, smooth, concave surface, 3/8" thick, unless other tooling is indicated on Drawings. Tooling of the mortar joint should be done when its surface is thumb-print hard utilizing a jointer having a diameter slightly larger than the mortar joint width. Striking joints with the same degree of hardness produces uniform joint appearance. Finishing is not only for appearance, but to seal the interface between mortar and masonry unit, while densifying the surface of the mortar joint.
- 3.3 GROUTING
- A. Do not grout until masonry has cured at least 24 hours.
 - B. Consolidate all grout at time of pouring by puddling with a mechanical vibrator, filling all cells of the masonry, and then reconsolidating later by puddling before the plasticity is lost.
- 3.4 CLEANING UP:
- A. Clean mortar from block each day.
 - B. Upon completion of the work of this Section, make a thorough inspection of all installed concrete unit masonry and verify that all units have been installed in accordance with the provisions of the Section. Make all necessary adjustments.
 - C. Clean all surfaces of concrete unit masonry as required for proper application of the specified finishes.
 - D. Upon completion of the work of this Section, promptly remove from the job site all mortar droppings, broken units, debris arising from the Work of this Section, and all tools and equipment of this Section, leaving all areas in a neat and orderly condition to the approval of the Architect.

END OF SECTION 04 22 23

GENERAL

1.1 SUMMARY:

- A. Provide and install all miscellaneous iron and steel items not specifically described in other sections of these specifications but required for a complete and operable facility as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

1.4 QUALITY ASSURANCE:

- A. Use only certified welders and the shielded arc process for all welding performed in connection with the work of this Section.

PRODUCTS

2.1 STEEL TUBING:

- A. All steel tubing shall be new, free from rust, and conforming with the requirements of ASTM A-500-B.

2.2 STEEL PLATE:

- A. All steel plate shall be new, free from rust, and conforming with the requirements of ASTM A-36.

2.3 BOLTS AND NUTS:

- A. All bolts and nuts shall be new, free from rust, and conforming with the requirements of A-307.

2.4 EXPANDED METAL:

- A. Expanded metal shall be carbon steel bond shearing $\frac{1}{2}$ " diamond pattern, 18 gauge, flattened, by McNichols Company or equal.

2.5 PRIMER PAINT:

- A. All primer paint shall be compatible with the finish coats specified in Section 09 91 00 of these Specifications except that, where no finish coats are required, all primer paint shall be Tnemec Series V10 99R, a primer meeting the requirements of Federal Specification TT-P-615(d), type I, or an equal approved in advance by the Architect.

2.6 OTHER MATERIALS:

- A. All other materials, not specifically described but required for a complete and proper installation of miscellaneous metal, shall be new, free from rust, best quality of their respective kinds, and subject to the approval of the Architect.

EXECUTION

3.1 SURFACE CONDITIONS:

- A. Make all required measurements in the field to ensure proper and adequate fit of miscellaneous metal items.
- B. Verify that miscellaneous metal may be fabricated and installed in strict accordance with the original design and the approved Shop Drawings.

3.2 FABRICATION:

- A. Fabricate all miscellaneous metal in strict accordance with the approved Shop Drawings and the referenced standards.
- B. Insofar as possible, shop prefabricate all items complete and ready for installation.
- C. Welding:
 - 1. Unless otherwise indicated on the Drawings, weld all shop connections.
 - 2. Make all joints and intersections of metal tight fitting and securely fastened.
 - 3. Make all work square, plumb, straight and true.
 - 4. All welds to be ground smooth.
 - 5. Reference AWS D1.1 for types of materials being welded.
- D. Holes:
 - 1. Drill or punch all holes required for the attachment of work of other trades and for bolted connections.
 - 2. Burned holes are not acceptable.
- E. Workmanship:
 - 1. Form exposed work true to line and level with accurate angles and surfaces and straight, sharp edges.
 - 2. Ease exposed edges to a radius of approximately 1/32 inch, unless indicated otherwise.
 - 3. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing the work.
 - 4. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces. Welds to be imperceptible in finished work.
 - 5. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible.
- F. Assemblies.
 - 1. Use materials of sizes and thickness indicated or required to produce strength and durability in finished product for use intended.
 - 2. Work to dimensions indicated.
 - 3. Fit and shop assemble in largest practical sections for delivery to site.
 - 4. Cut, reinforce, drill and tap miscellaneous metal work as required to receive finished hardware and similar items.

5. Exposed mechanical fasteners: When application will not permit concealed fasteners, locate exposed fasteners in unobtrusive manner, consistent with design of component, except where specifically noted otherwise. Use Phillips flat-head countersunk screws or bolts for exposed fasteners.
6. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
7. Fabricate joints exposed to the weather to be weather tight and provide weep holes as required.
8. Continuously seal joined members by continuous welds.

3.3 SHOP PAINTING:

A. Preparation:

1. Thoroughly clean all metal as described in Section 099100 of these Specifications.
2. Provide all required protection for metal to be encased in concrete to prevent accumulation of deleterious foreign material.

B. Shop prime all steel except:

1. Steel to be encased in concrete or masonry;
2. Surfaces to be welded;
3. Steelwork which will be concealed by interior finish.

3.4 ERECTION:

- A. Erect and install all miscellaneous metal in strict accordance with the Drawings, the approved Shop Drawings, and the referenced standards, aligning straight, plumb, and level within a tolerance of one in 200.
- B. After the erection and installation are complete, touch-up all shop priming coats damaged during transportation and erection, using the priming paint specified for shop priming.

END OF SECTION 05 50 00

GENERAL

1.1 SUMMARY:

- A. Provide and install vertical metal ladders where shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

PRODUCTS

2.1 METAL LADDERS:

- A. Design is based on use of O'Keeffe's Inc. extruded aluminum vertical ladders #500 standard channel design, or equivalent fabricated steel per Drawings.

EXECUTION

3.1 INSTALLATION:

- A. Install the ladders in strict accordance with all pertinent codes and regulations, the original design, and the manufacturer's recommendations, anchoring all components firmly and securely for long life under hard use.

END OF SECTION 05 51 33

GENERAL

1.1 SUMMARY:

- A. Provide and Install steel pipe and tube handrails, balusters and fittings as shown on the Drawings and Specified herein.
- B. Related Sections: 05 50 00 Metal Fabrications

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.
- B. Indicate component details, materials, finishes, connection and joining methods, and the relationship to adjoining work.

1.4 STRUCTURAL REQUIREMENTS:

- A. Railing assembly, wall rails, and attachments to resist lateral force of 100 lbs. at any point without damage or permanent set.

PRODUCTS

2.1 BASIS OF DESIGN:

- A. Julius Blum and Company, Inc.
- B. Substitutions: Items of same function and performance are acceptable in accordance with the General and Special Provisions of these Specifications.

2.2 STEEL RAILING SYSTEM:

- A. Rails and Posts: 1-1/2 inches outside diameter steel pipe; welded jointing, Schedule 40.
- B. Intermediate Rails: 1" outside diameter steel pipe; welded jointing, Schedule 40.
- C. Fittings: Elbows, t-shapes, wall brackets, escutcheons; machined steel.
- D. Mounting: Brackets "Blum" WBHC with expansion shield or lag bolt per wall type application.
- E. Splice connectors: Steel welding collars.
- F. Primer: FS TT-P-31, red; two coats.

2.3 FABRICATION:

- A. Verify dimensions on site prior to shop fabrication.
- B. Fit and shop assemble sections in largest practical sizes, for delivery to site and installation.
- C. Supply components required for secure anchorage of hand-rails and railings.
- D. Grind exposed welds smooth and flush with adjacent surfaces.
- E. Make exposed joint butt tight, flush and hairline.

- F. Accurately form components required for anchorage of railings to each other and to building structure.
- G. Provide expansion joints in all runs that exceed 20'.

EXECUTION

3.1 PREPARATION:

- A. Supply items to be cast into concrete with setting templates and erection drawings to appropriate sections.

3.2 INSTALLATION:

- A. Install in accordance with Shop Drawings and manufacturer's instructions.
- B. Erect work square and level, free from distortion or defects detrimental to appearance or performance.
- C. Anchor handrailings securely to structure.
- D. Weld field connections and grind smooth to complete assembly. Touch-up welds with primer.

END OF SECTION 05 52 13

GENERAL

1.1 SUMMARY

- A. Section includes insulating wall sheathing with integral water-resistive barrier and air barrier.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Product Data: For each type of sheathing product specified.
- B. Evaluation Reports: From ICC-ES, for wood sheathing and seamtape.
- C. Product Certifications: From manufacturer, indicating that sheathing products comply with ICC-ES AC269 and ICC-ES AC310.
- D. Warranty: Executed copy of manufacturer special warranties.

1.4 REFERENCES

- A. American Society of Mechanical Engineers (ASME): www.asme.org
 - 1. ASME B18.6.1 - Wood Screws (Inch Series)
- B. ASTM International (ASTM): www.astm.org
 - 1. ASTM A153/A153M - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 2. ASTM C1289 - Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
 - 3. ASTM D779 - Test Method for Water Resistance of Paper, Paperboard, and Other Sheet Materials by the Dry Indicator Method
 - 4. ASTM D1621 - Test Method for Compressive Properties Of Rigid Cellular Plastics
 - 5. ASTM D2247 - Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
 - 6. ASTM E96/E 96M - Test Methods for Water Vapor Transmission of Materials
 - 7. ASTM E331 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
 - 8. ASTM E2357 - Test Method for Determining Air Leakage of Air Barrier Assemblies
 - 9. ASTM F1667 - Specification for Driven Fasteners: Nails, Spikes, and Staples
 - 10. ASTM G154 - Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
- C. ICC Evaluation Services, Inc. (ICC-ES): www.icc-es.org
 - 1. ICC-ES AC12 - Acceptance Criteria For Foam Plastic Insulation
 - 2. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers
 - 3. ICC-ES AC116 - Acceptance Criteria for Nails and Spikes

4. ICC-ES AC148 - Acceptance Criteria For Flexible Flashing Materials
5. ICC-ES AC201 - Acceptance Criteria for Staples
6. ICC-ES AC269 - Acceptance Criteria for Racking Shear Evaluation of Proprietary Sheathing Materials attached to Light-Frame Wall Construction or Code-Complying Sheathing Attached to Light-Framed Walls with Proprietary Fasteners
7. ICC-ES AC310 - Acceptance Criteria for Water-Resistive Membranes Factory-bonded to Wood-based Structural Sheathing, Used as Water-Resistive Barriers
8. ICC-ES ESR-1539 - Power Driven Staples and Nails for Use in Engineered and Non-Engineered Connections
9. ICC-ES NER-272 - Power Driven Staples and Nails for Use in All Types of Building Construction

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide wood products from manufacturer certified by SFI, FSC, or comparable sustainable forestry program acceptable to Architect.
- B. Provide wall sheathing products meeting requirements for water-resistive barrier in accordance with ICC-ES AC310.
- C. Provide wall sheathing products meeting requirements of ICC-ES AC269.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's written instructions for protection of sheathing products from weather prior to installation.

1.7 WARRANTY

- A. Special Manufacturer's Warranty: Manufacturer's standard form in which sheathing manufacturer agrees to repair or replace sheathing products that demonstrate deterioration or failure under normal use due to manufacturing defects within warranty period specified, when installed according to manufacturer's instructions.
 1. Warranty Period for Sheathing Products: [30] years following date of Substantial Completion.
 2. Warranty Conditions: Special warranties exclude deterioration or failure due to structural movement resulting in stresses on sheathing products exceeding manufacturer's written specifications, or due to air or moisture infiltration resulting from cladding failure or mechanical damage.

PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Provide sheathing products manufactured by Huber Engineered Woods LLC, Charlotte NC; Phone: (800) 933-9220; Website: www.zipsystem.com.

2.2 PERFORMANCE REQUIREMENTS

- A. Air-Barrier Assembly Air Leakage: Less than 0.04 cfm/sq. ft. at 1.57 lbf/sq. ft. (0.2 L/s x sq. m at 75 Pa), per ASTM E2375.
- B. Water-Vapor Permeance, Facer: Minimum 12 perms (689 ng/Pa x s x sq. m), ASTM E96/E96M.

- C. Weather Exposure: Manufacturer warranty applies for maximum allowable exposure period of 180 days.

2.3 MATERIALS

- A. Oriented Strand Board: DOC PS 2, made with binder containing no added urea formaldehyde.
- B. Rigid Foam Plastic Insulating Board: Rigid polyisocyanurate foam core complying with ASTM C1289 Type II, Class 2, and ICC-ES AC12, with coated glass fiber facers on both sides, with the following characteristics:
 - 1. Nominal Density: 2.0 pcf (32 kg/cu. m).
 - 2. Compressive Strength, ASTM D1621: Not less than 20 psi (150 kPa).
 - 3. Vapor Permeance, ASTM E96/E96M: Less than 1.0 perm.
 - 4. Edge Configuration: Square finished.

2.4 COMPOSITE INSULATING WALL SHEATHING

- A. Composite Insulating Wall Sheathing: Oriented-strand-board Exposure 1 sheathing 7/16 inch (11.1 mm) thick, with factory-laminated water-resistive barrier exterior facer, and with rigid foam plastic insulating board laminated to interior face.
- B. Basis-of-Design Product: Provide Huber Engineered Woods LLC; ZIP System R Sheathing.
- C. Span Rating and Performance Category of Sheathing Layer: Not less than 24/16; 7/16 Performance Category.
- D. Thickness: 1-1/2 inch (38 mm), or as schedules on the Drawings
- E. Thermal Resistivity (R Value): 6.6 deg F x h x sq. ft./Btu x in. at 75 deg F
- F. Edge Profile: Square edge.
- G. Exterior Facer: Medium-density, phenolic-impregnated polymer-modified sheet material meeting requirements for ASTM D779 Grade D weather-resistive barrier in accordance with ICC AC38 and AC310, with fastener spacing symbols on exterior facer for 16-inch (406 mm) and 24-inch (610 mm) on center spacing, with the following characteristics
 - 1. Water Resistance of Coatings, ASTM D2247: Pass 14 day exposure test.
 - 2. Moisture Vapor Transmission, ASTM E96: Not less than 12 perms.
 - 3. Water Penetration, ASTM E331: Pass at 2.86 lbf/sq. ft. (137 Pa).
 - 4. Wind Driven Rain, TAS-100: Pass.
 - 5. Accelerated Weathering, ASTM G154: Pass.

2.5 FASTENERS

- A. Fasteners, General: Size and type complying with manufacturer's written instructions for Project conditions and requirements of authorities having jurisdiction.
 - 1. Corrosion Resistance: Hot-dip zinc coating, ASTM A153/A 153M or Type 304 stainless steel.
- B. Nails, Brads, and Staples: ICC AC116 and ICC AC201.
- C. Power-Driven Fasteners: ICC-ES-1539 or NER-272.
- D. Wood Screws: ASME B18.6.1.

2.6 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIAL

- A. Self-Adhering Seam and Flashing Tape: Pressure-sensitive, self-adhering, cold-applied, seam tape consisting of polyolefin film with acrylic adhesive, meeting ICC AC148.
 - 1. Basis-of-Design Product: Provide Huber Engineered Woods; ZIP System Tape.
 - 2. Thickness: 0.012 inch (0.3 mm).

EXECUTION

3.1 EXAMINATION

- A. Examine framing spacing and alignment to determine if work is ready to receive sheathing. Proceed with sheathing work once conditions meet requirements.

3.2 SHEATHING INSTALLATION

- A. Install sheathing panels in accordance with manufacturer's written instructions, requirements of applicable Evaluation Reports, and requirements of authorities having jurisdiction.
- B. Air and Moisture Barrier: Coordinate sheathing installation with flashing and joint sealant installation and with adjacent building air and moisture barrier components to provide complete, continuous air- and moisture- barrier.
- C. Do not bridge expansion joints; allow joint spacing equal to spacing of structural supports.
- D. Install panels with laminated facer to exterior. Stagger end joints of adjacent panel runs.
- E. Attach sheathing panels securely to substrate with manufacturer-approved fasteners in compliance with the following:
 - 1. ICC-ES ESR-1539 or ICC-NES NER-272 for power-driven fasteners.
 - 2. California Building Code (CBC): Table 2304.10.1 Fastening Schedule.
 - 3. Details and schedules on the Drawings.
- F. Apply seam tape at all panel seams, penetrations, and facer defects or cracks to form continuous weathertight surface. Apply tape according to manufacturer's written instructions and requirements of ICC-ES applicable to tape application.

END OF SECTION 06 16 13

GENERAL

1.1 SUMMARY

Provide and install all finish carpentry as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS:

This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provision of Section 013323 of these specifications.
- B. Fabrication (shop) drawings shall meet the standards set forth by the Woodwork Institute. A sample of shop drawings meeting these requirements can be found here:
<http://woodworkinstitute.com/architectural-resources/shop-drawings/>

1.4 INDOOR AIR POLLUTANT CONTROL REQUIREMENTS:

- A. Hardwood plywood, particle board and medium density fiberboard composite wood products shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et. seq.) by or before the dates specified in those sections.
 - 1. Documentation: Verification of compliance shall include one of the following:
 - a. Product certifications and specifications
 - b. Chain of custody certifications
 - c. Other methods acceptable to the local enforcement agency
- B. Per Section 5.504.4.1 of the 2016 California Green Building Standards Code, 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 of the 2016 California Green Building Standards Code. 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)

1.5 QUALITY CONTROL

Install work in this section in accordance with the latest published edition of Architectural Woodwork Standards published by AWI/WI;

PRODUCTS

2.1 MATERIALS, GENERAL:

- A. Lumber: DOC PS 20 and grading rules of inspection agencies certified by American

Lumber Standards Committee Board of Review.

- B. Hardwood Plywood: HPVA HP-1. Comply with Indoor Air Pollutant Control Requirements Section 1.4 of these specifications
- C. Medium Density Fiberboard (MDF): ANSI A208.2, Grade 130 made with binder containing no urea-formaldehyde resin.
- D. Particleboard: ANSI A208.1, Grade M-2. Comply with Indoor Air Pollutant Control Requirements Section 1.4 of these specifications

2.2 EXTERIOR FINISH CARPENTRY:

- A. Exterior Lumber Fascia and Trim: Saw-textured, Grade A, western red cedar - Maximum Moisture Content: 15 percent.

2.3 INTERIOR STANDING AND RUNNING TRIM:

- A. Interior Wood Trim Work: Cherry, "A" grade, in profile shown on the Drawings.
- B. Interior Wood Paneling: Cherry, "A" grade, quarter cut book match veneer on $\frac{3}{4}$ " MDF with $\frac{1}{4}$ " solid Cherry edge-band, all sides. Blueprint match within room.

2.4 MISCELLANEOUS MATERIALS:

- A. Fasteners for Exterior Finish Carpentry: hot-dip galvanized steel.
- B. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer. Comply with Indoor Air Pollutant Control Requirements Section 1.4 of these specifications.
- C. Use waterproof resorcinol glue for exterior applications.

EXECUTION

3.1 INSTALLATION:

- A. Condition finish carpentry in installation areas for 24 hours before installing.
- B. Prime and backprime lumber for painted finish exposed on the exterior.
- C. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Scribe and cut to fit adjoining work. Refinish and seal cuts.
- D. Install standing and running trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Stagger joints in adjacent and related trim. Cope at returns and miter at corners.
- E. Wood Paneling:
 - 1. Install wood paneling over gypsum board with panel adhesive, continuous bead around edges and beads at 6" o.c. (field). Use finish nails only as required to hold panels in alignment until adhesive sets.

2. Apply paneling in pattern and direction of grain as shown on the Drawings.
 3. All paneling shall have edges routes with a 1/8" bevel.
- F. Sand all smooth-finish wood surfaces thoroughly to produce a uniformly smooth surface.
- G. Prepare wood surfaces to receive semi-transparent stain as specified in Section 09 91 00.

END OF SECTION 06 20 00

GENERAL

1.1 SUMMARY:

Provide and install cabinetry as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS:

This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- B. Make submittals to the Architect in accordance with the provision of Section 013323 of these specifications. The Architect shall be the sole judge as to the acceptability of all products submitted in accordance with the provisions of Section 012500 of these specifications.
- C. Fabrication (shop) drawings shall meet the standards set forth by the Woodwork Institute. A sample of shop drawings meeting these requirements can be found here:
<http://woodworkinstitute.com/architectural-resources/shop-drawings/>

1.4 INDOOR AIR POLLUTANT CONTROL REQUIREMENTS:

- A. Composite wood products used for finish carpentry shall contain no added urea formaldehyde resins. Laminating adhesives used to fabricate composite wood finish carpentry assemblies shall contain no added urea formaldehyde resins.
 - 1. Documentation: Verification of compliance shall include one of the following:
 - a. Product certifications and specifications
 - b. Chain of custody certifications
 - c. Other methods acceptable to the local enforcement agency
- B. Per Table 5.504.4.1 of the 2016 California Green Building Standards Code, 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 of the 2016 California Green Building Standards Code. 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).

1.5 ENVIRONMENTAL LIMITATIONS:

Do not deliver or install woodwork until building is enclosed, wet work is completed, and HVAC system is operating.

1.6 QUALITY CONTROL:

Install work in this section in accordance with the latest published edition of North American Architectural Woodwork Standards (NAAWS) published by WI and AWMAC.

PRODUCTS

2.1 MATERIALS:

- A. Hardboard: AHA A135.4.
- B. Medium-Density Fiberboard: ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
- C. Particleboard: ANSI A208.1, Grade M-2.
- D. Softwood Plywood: DOC PS 1. Veneer core plywood shall be a non-telegraphing hardwood.
- E. Hardwood Plywood and Face Veneers: HPVA HP-1, made with adhesive containing no urea formaldehyde.
- F. Thermoset Decorative Panels: Comply with LMA SAT - 1.
- G. High-Pressure Decorative Laminate: NEMA LD 3.
 - 1. Manufacturers: Formica, Wilsonart, Nevamar, or equal.
 - 2. Products:
 - a. Standard laminate. Color as indicated on Drawings
- H. Thermally Fused Laminate: NEMA LD 3 GP-28.
 - 1. Manufacturers: American Laminates, or equal.
 - 2. Products:
 - b. Standard laminate. Color as indicated on Drawings
- I. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.
 - 1. Products: Corian or equal.
- J. Thermofused Melamine: Wilsonart Contract or equal, white
- K. Edge Band: veneer of same species and cut as exposed surfaces for wood veneer casework and HGS high pressure laminate for plastic laminate casework.

2.2 CABINET HARDWARE AND ACCESSORY MATERIALS:

- A. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening, Blum, Gras or equal.
- B. Pulls:
 - 1. Wire Pulls: Back mounted, solid metal, 4 inches (100 mm) long, 5/16 inch (8 mm) in diameter, Trimco #562-4 or equal. Oil Rubbed Bronze Finish
- C. Catches: Ball friction catches, BHMA A156.9, B03013.

- D. Adjustable Shelf Standards and Supports: KV 255ZC standards and KV 237ZC clips for glass shelves and KV 180A standards and KV 180A brackets for wood shelves.
- E. Drawer Slides: BHMA A156.9, B05091, KV1300 series or equal.
 - 1. Box Drawer Slides: Grade 1HD-100.
 - 2. File Drawer Slides: Grade 1HD-100.
 - 3. Pencil Drawer Slides: Grade 1.
 - 4. Keyboard Slides: Grade 1.
 - 5. Trash Bin Slides: Grade 1HD-100.
- F. Cabinet Locks: Provide and install cabinet locks where shown on the Drawings.
 - 1. Pin Tumbler Door and Drawer Deadbolt Locks
 - a. Schlage CL721G/CL771G deadbolt locks with removable key cylinder; 'C' keyway and 6 pin solid brass cylinder. Provide barrel length, handing and accessories as required per conditions.
 - b. Provide cylinders construction keyed. At substantial completion, provide the services of a professional locksmith who shall key the cabinet locks, in coordination with the door locksets, as directed by the Owner.
 - 2. Pin Tumbler Cylinder Cam Locks
 - a. Schlage CL720G Cam Lock with removable Schlage 'C' keyway.
 - b. Provide cylinders construction keyed. At substantial completion, provide the services of a professional locksmith who shall key the cabinet locks, in coordination with the door locksets, as directed by the Owner.
- G. Grommets for Cable Passage through Countertops: 2-inch (51-mm) OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
- H. Exposed Hardware Finishes: Comply with BHMA A156.18 for BHMA code number indicated.
 - 1. Finish: Oil Rubbed Bronze: BHMA 613
- I. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to 15 percent moisture content.

2.3 INTERIOR WOODWORK:

- A. Wood Cabinets for Transparent Finish: Premium grade.
 - 1. AWI/WI Type of Cabinet Construction: Flush overlay.
 - 2. WI Construction Style: Style A, Frameless.
 - 3. WI Door and Drawer Front Style: Flush overlay stile and rail with raised panel 'Shaker' profile.
 - 4. Wood Species and Cut for Exposed Exterior Surfaces: Cherry 'A' Grade, quarter cut, book match. Millwork veneer shall comply with Section 06 20 00 Finish Carpentry for visual compatibility of veneers.
 - 5. Grain Direction: As indicated.
 - 6. Matching of Veneer Leaves: Random match.
 - 7. Retain one of three options in first subparagraph below for Premium-grade cabinets.
 - 8. Veneer Matching within Panel Face: Center-balance match.
 - 9. Exposed Interior Surfaces: Same species and cut indicated for exposed exterior surfaces.
 - 10. Semi-Exposed Surfaces other than drawer boxes: Wood of compatible species to the exposed surfaces

11. Drawer Sides and Backs: Thermofused Melamine
12. Drawer Bottoms: Thermofused Melamine
- B. Plastic-Laminate Cabinets: Premium grade.
 1. AWI/WI Type of Cabinet Construction: Flush overlay
 2. WI Construction Style: Style A, Frameless.
 3. WI Door and Drawer Front Style: Flush overlay stile and rail with raised panel 'Shaker' profile style.
 4. Laminate Cladding: Horizontal surfaces other than tops, HGS; postformed surfaces, HGP; vertical surfaces, HGS.
 5. Drawer Sides and Backs: Thermofused Melamine
 6. Drawer Bottoms: Thermofused Melamine
 7. Edge Banding: HGS laminate to match adjacent surface
- C. Plastic-Laminate Countertops: Premium grade.
 1. Laminate Grade: HGS for flat countertops, HGP for post-formed countertops.
 2. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- D. Solid-Surfacing Material Countertops: Premium grade.
 1. Solid-Surfacing Material Thickness: 1/2 inch (13 mm) thick.
 2. Fabricate tops in one piece with shop-applied backsplashes and edges.
- E. Plastic-Laminate Paneling and Moulding: Premium Grade.
 1. Laminate Grade: HGS for vertical surfaces, HGP for post-formed profiles
 2. Substrate. Comply with standards above for plywood and particleboard
 3. Profiles as indicated on Drawings, or eq
 4. Colors as indicated on Drawings, or eq

2.4 SHOP FINISHING OF INTERIOR ARCHITECTURAL WOODWORK:

- A. Finishes: Same grades as items to be finished.
- B. Finish architectural woodwork at the fabrication shop; defer only final touch up until after installation.
 1. Apply one coat of sealer or primer to concealed surfaces of woodwork. Provide Premium finish.
 2. Apply a vinyl wash coat to woodwork made from closed-grain wood before staining and finishing.
 3. After staining, if any, apply paste wood filler to open-grain woods and wipe off excess. Tint filler to match stained wood.
- C. Transparent Finish: AWI/WI finish system catalyzed polyurethane in accordance with Section 5 of the NAAWS manual.

EXECUTION

3.1 EXAMINATION:

- A. Verify the adequacy and proper location of any required backing or support framing.
- B. All wood or metal frame construction shall be constructed with continuous in wall blocking

of either 3x6 flat Douglas Fir or 16 GA x 6" wide, 50 KSI sheet metal provided in accordance with the location requirements included on the fabricator / installer's shop drawings. Responsibility for blocking installation shall be that of the wall fabricator.

- C. Verify that mechanical, electrical, plumbing and other building components effecting work in this section are in place and ready.

3.2 INSTALLATION:

- A. Install all work in conformance with the North American Architectural Woodwork Standards, latest edition.
 - 1. Installation shall conform to the NAAWS Grade of the items being installed.
- B. All work shall be secured in place square, plumb and level.
- C. All work abutting other building components shall be properly scribed.
- D. Mechanical fasteners used at exposed and semi-exposed surfaces, excluding installation attachment screws and those securing cabinets end to end, shall be countersunk.
- E. Equipment cutouts shown on plans shall be cut by the installer.

3.3 ADJUSTING AND TOUCHUP:

- A. Before completion of the installation, the installer shall adjust all moving and operation parts to function smoothly and correctly.
- B. All nicks, chips and scratches in the finish shall be filled and retouched. Damaged items which cannot be repaired shall be replaced.

3.4 CLEAN UP:

Upon completion of installation the installer shall clean all installed items of pencil and ink marks, and broom clean his area of operation, depositing debris in containers provided by the general contractor.

3.5 FINAL INSPECTION:

- A. Prior to final inspection and acceptance by the Architect, completely check each installed item and adjust for proper operation.
- B. The Owner reserves the right to request and pay for an inspection by a representative of the Woodwork Institute of California to determine that all work of this Section has been performed in accordance with the referenced standards.
- C. In the event that such inspection determines that architectural woodwork, or any part of it does not comply with the referenced standards, immediately remove the non-complying items and immediately replace them with items complying with the referenced standards and these Specifications, all at no additional cost to the Owner.

END OF SECTION 06 41 00

GENERAL

1.1 SUMMARY:

- A. Provide and install manufactured PVC mouldings, trim, and accessories as shown on drawings and specified herein.

1.2 REFERENCES

- A. ASTM International (ASTM): ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 23 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with requirements of authorities having jurisdiction and applicable codes at the location of the project.
- B. Manufacturer Qualifications: Minimum 5 years experience manufacturing similar products.
- C. Installer Qualifications: Minimum 2 years experience installing similar products.
- D. Mock-Ups: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Construct area designated by Architect.
 - 2. Do not proceed with remaining work until workmanship is accepted by Architect.
 - 3. Remodel mock-up area as required to produce acceptable work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Comply with manufacturer's recommendations. Handle materials to avoid damage.

1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.7 WARRANTY

- A. Provide manufacturer's standard 25 year limited warranty for products, stating that components will be free from defects in material that occur as a direct result of the manufacturing process, occur under normal use and service, occur during the warranty period and result in blistering, peeling, flaking, cracking, splitting, cupping, rotting or structural defects from termites or fungal decay.

PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Azek Building Products, Inc., which is located at: 894 Prairie Ave.; Wilmington, OH 45177; Toll Free Tel: 877-ASK-AZEK; Email: [request info \(raymond.bielawski@cpgbp.com\)](mailto:raymond.bielawski@cpgbp.com); Web: <http://www.azek.com> | <http://timbertech.com>
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 - Product Options and Substitutions.

2.2 TRIM

- A. Fire Performance Characteristics: Provide products complying with the following:
 - 1. Flame Spread Index: Less than 25, ASTM E 84.
- B. PVC Trim: Material shall have the following characteristics:
 - 1. Material: Solid Cellular PVC.
 - 2. Style: Traditional.
 - 3. Trim Size, 5/4 Thickness and as indicated on Drawings:

2.3 MOULDINGS

- A. Detail Profiles: Material shall have the following characteristics:
 - 1. Material: Solid Cellular PVC.
 - 2. Detail Profile:
 - a. Water Table: 2-3/4 inches x 2 inch x 18 feet, AZM-6935.
 - b. Quarter Round: 3/4 inches x 3/4 inches x 16 feet, AZM-105.

2.4 ACCESSORIES

- A. Fasteners: Stainless steel or hot-dip galvanized, with thin shank, blunt point, full round head as recommended by the manufacturer.
- B. Adhesives: Azek Adhesive, a non-toxic, odorless, UV stable, water-based PVC cement.
- C. Sealants: Urethane, polyurethane or acrylic based sealants without silicone.

EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify conditions that may be detrimental to proper or timely completion.
- B. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION - TRIM

- A. Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.
- B. Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.

- C. Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.
- D. Maintain clearance between trim and adjacent finished grade.
- E. Refer to the Drawings for inside and outside corner conditions.
- F. Allow 1/8 inch gap between trim and siding.
- G. Seal gap with high quality, paint-able caulk.
- H. Shim frieze board as required to align with corner trim.

3.3 FINISHING

- A. Finish factory primed siding in accordance with Section 09 91 00 within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 06 60 00

GENERAL

- 1.1 SUMMARY:
Provide and install building insulation as shown on the Drawings and specified herein including but not necessarily limited to batts in roof rafter spaces, wood stud spaces at exterior walls, noise reduction batts in interior walls, and rigid insulation over structural roof sheathing.
- 1.2 GENERAL REQUIREMENTS:
This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.
- 1.3 SUBMITTALS:
Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.
- 1.4 CODES AND STANDARDS
All building insulation materials shall conform to the certified requirements and shall be installed to meet flame and smoke spread density requirements of State of California Title 24.

PRODUCTS

- 2.1 BUILDING INSULATION:
- A. All glass fiber building insulation except as noted herein shall be the product of Owens/Corning Fiberglas, CertainTeed or an equal approved in advance by the Architect. All glass fiber batts shall be formaldehyde-free type insulation.
 - B. Ceiling and Rafters: At all roofs and ceilings where noted furnish and install Flame Spread 25 faced glass fiber batts having a thermal resistance "R" value of R-30 for insulation only.
 - C. Exterior Walls: At all exterior walls, furnish and install unfaced glass fiber batts having a thermal resistance of R-19 for insulation only in each stud cavity.
 - D. Interior walls:
 - 1. In all interior walls furnish and install unfaced sound attenuation batts by Owens Corning, CertainTeed, or approved equal; 3-1/2 inch thick batts in 2 x 4 walls and 5-1/2 inch thick batts in 2 x 6 walls in each of the stud cavities.
 - E. Rigid Composite Insulation, Sloped Roof:
 - 1. Base Layer: composite polyisocyanurate foam board
 - 2. Top Layer, Nailable Surface: composite polyisocyanurate foam bonded to 7/16" strand board, AC Foam Nail Base as manufactured by Atlas, or equal.
 - 3. Stagger joints between layers and mechanically fasten rigid insulation boards to structural deck to resist code-prescribed wind uplift forces in patterns as recommended and approved by the manufacturer.
 - 4. Thickness and R-value as specified on the Drawings.
- 2.2 OTHER MATERIALS:
All other materials such as fasteners and retainers, not specifically described but required for a

complete and proper installation of building insulation, shall be as recommended by the manufacturer; selected by the Contractor subject to the approval of the Architect.

EXECUTION

3.1 INSTALLATION:

- A. Except as otherwise specifically directed by the Architect, install building insulation in accordance with the current edition of the Owens/Corning Fiberglas publication 3-BL-4992 "Fiberglas Building Insulation Application Instructions" where applicable.
- B. Install insulation in areas and in thicknesses indicated or required to produce R-values indicated. Cut and fit tightly around obstructions and fill voids with insulation.
- C. Install the rigid composite sloped roof insulation with the strand board facing up and in strict accordance with the manufacturer's directions.

3.2 INSPECTION:

Upon completion of the installation, visually inspect each insulated area and verify that all insulation is complete and properly installed.

END OF SECTION 07 21 00

GENERAL

1.1 SUMMARY:

- A. Provide and install granule surfaced asphalt composition shingle roofing as shown on the Drawings and specified herein including, but not necessarily limited to, composition shingle roof, membrane underlayment, associated metal flashing, and fasteners.

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.
- B. Product Data: Provide manufacturer's printed product information indicating material characteristics, performance criteria and product limitations.
- C. Manufacturer's Installation Instructions: Provide published instructions that indicate preparation required and installation procedures.
- D. Certificate of Compliance: Provide Certificate of Compliance from an independent laboratory indicating that the asphalt fiberglass shingles made in normal production meet or exceed the requirements of the following:
 - 1. ASTM E 108/UL 790 Class A Fire Resistance
 - 2. ASTM D 3161/UL 997 Wind Resistance.
 - 3. ASTM D 3462

1.4 REFERENCES

- A. ASTM A 653/A 653M – Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc-Iron-Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM D 225 – Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules.
- C. ASTM D 1970 – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials used as Steep Roofing Underlayment for Ice Dam Protection.
- D. ASTM D 3018 – Standard Specification for Class A Shingles Surfaced with Mineral Granules.
- E. ASTM D 3161 – Standard Test Method for Wind Resistance of Asphalt Shingles (Fan-Induced Method).
- F. ASTM D 3462 – Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
- G. ASTM D 4586 – Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- H. ASTM D-4869 – Standard Specification for Asphalt-Saturated Organic Felt Shingle Underlayment Used in Roofing.
- I. ASTM D 6757 – Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products.
- J. ASTM E 108 – Standard Test Methods for Fire Test of Roof Coverings

- K. ASTM G 21 – Determining Resistance of Synthetic Polymers to Fungi
- L. Sheet Metal & Air Conditioning Contractors National Association (SMACNA) Architectural Sheet Metal Manual, latest edition.
- M. National Roofing Contractors Association (NRCA) Guidelines for Asphalt Shingle Roof Systems and Quality Control Guidelines for the Application of Asphalt Shingle Roof Systems

1.5 QUALITY ASSURANCE

- A. Installer Minimum Qualifications: Installer shall be licensed or otherwise authorized by all federal, state and local authorities to install all products specified in this section. Installer shall perform work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Verify that manufacturer's label contains references to specified ASTM standards

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store Products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials and materials used with solvent based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Deliver shingles to site in manufacturer's unopened labeled bundles. Promptly verify quantities and conditions. Immediately remove damaged products from site.

1.7 WARRANTY

- A. Manufacturer's Warranty: Furnish shingle manufacturer's warranty for the product listed below:
 - 1. 40-year commercial project warranty
- B. Warranty Supplement: Provide manufacturer's supplemental non-prorated warranty to cover labor and materials in the event of a material defect for the following period after completion of application of shingles:
 - 1. First Five Years
- C. Provide Upgraded Wind Warranty from 110 to 130 mph for first 15 years by complying with all manufacturers' conditions and instructions.

PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Provide products manufactured by the CertainTeed Corporation. Contact Sales Support Group P.O. Box 860 Valley Forge, PA 19482 Toll Free 800-233-8990

2.2 ASPHALT FIBERGLASS SHINGLES

- A. Basis of Design: CertainTeed Presidential Shake TL: Conforming to ASTM D 3018 Type I – Self-Sealing; UL Certification of ASTM D 3462, ASTM D 3161 Class "F" (110-mph)/UL997 Wind Resistance and UL Class A Fire Resistance, glass fiber mat base; ceramically coated/UV resistant mineral surface granules across entire face of shingle; "Tri-laminate": three-layer laminated, four-tab shingle.
 - 1. Weight: 480 pounds per square (100 square feet) (23.4 kg/sq m)
 - 2. Color: refer to the Drawings

2.3 SHEET MATERIALS

- A. Open Valley Protection: CertainTeed "WinterGuard"; ASTM D1970 sheet barrier of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement and "split" back plastic release film; provide material warranty equal in duration to that of shingles being applied.
 - 1. CertainTeed WinterGuard HT
- B. Underlayment: CertainTeed Diamond Deck ASTM D 226 and ASTM D 4869 synthetic polymer-based scrim reinforced underlayment designed for use on roof decks as a water-resistant layer beneath asphalt shingles, wood shingles, and shakes, metal shingles or slate.

2.4 FLASHING MATERIALS

- A. Sheet Flashing: 24 gauge hot-dipped galvanized steel with zinc coating 1¼ - 1½ ounces per square foot conforming with ASTM A653
 - 1. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual."
 - 2. Drip Edge: Formed sheet metal with at least a 2-inch (50-mm) roof deck flange and a 1-1/2-inch (38-mm) fascia flange with a 3/8-inch (9.6-mm) drip at lower edge.
 - 3. Open-Valley Flashing: Fabricate with 1-inch- (25-mm-) high inverted-V profile at center of valley and equal flange widths of 12 inches (300 mm).
- B. Bitumious Paint: Acid and alkali resistant type; black color.
- C. Tinner's Paint: Color as selected by Architect to coordinate with shingle color.

2.5 FLASHING FABRICATION

- A. Form flashing to profiles indicated on Drawings and to protect roofing materials from physical damage and shed water.
- B. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

2.6 ACCESSORIES

- A. Nails: Standard round wire type roofing nails, corrosion resistant; hot dipped zinc coated steel, aluminum or chormated steel; minimum 3.8 inch (9.5mm) head diameter; minimum 11 or 12 gage (2.5mm) shank diameter; shank to be sufficient length to penetrate through the roof sheathing or ¾ inch (19mm) into solid wood, plywood or non-veneer wood decking.
- B. Asphalt Roofing Cement: ASTM D 4586, Type I or II

EXECUTION

3.1 EXAMINATION

- A. Verify existing site conditions under provisions.
 - 1. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surfaces.
 - 2. Verify deck surfaces are dry and free of ridges, warps or voids.

3.2 ROOF DECK PREPARATION

- A. Follow shingle manufacturer's recommendations for acceptable roof deck material
- B. Broom clean deck surfaces under eave protection and underlayment prior to their application.

3.3 INSTALLATION – PROTECTIVE UNDERLAYMENT

- A. Diamond Deck Synthetic Roofing Underlayment: Follow manufacturer's printed instructions for site-specific application of this product. Do not use staples on this product.
- B. Weather-lap and seal watertight with asphalt roofing cement items projecting through or mounted on roof. Avoid contact of solvent-based cements with WinterGuard and Diamond Deck.

3.4 INSTALLATION – VALLEY PROTECTION

- A. For "open" valleys, first place one ply of WinterGuard, minimum 36 inches (910 mm) wide, centered over valleys. Lap joints minimum of 6 inches (152 mm) Follow instructions of shingle and waterproofing membrane manufacturer.
- B. Install sheet metal flashing in accordance with SMACNA and NRCA standards and roofing manufacturer's instructions.

3.5 INSTALLATION – METAL FLASHING

- A. Weather-lap joints minimum 2 inches (50 mm).
- B. Seal work projecting through or mounted on roof with asphalt roofing cement and make weather tight.

3.6 INSTALLATION- ASPHALT SHINGLES

- A. Install shingles in accordance with manufacturer's instructions for product type and application specified.

3.7 PROTECTION OF FINISHED WORK

- A. Do not permit traffic over finished roof surface.

END OF SECTION 07 31 13

GENERAL

1.1 SUMMARY:

- A. Provide and install manufactured fiber-cement siding, trim, and accessories as shown on drawings and specified herein.

1.2 RELATED SECTIONS

- A. Section 06 16 13 – Insulating Sheathing
- B. Section 09 22 13 – Metal Furring
- C. Section 09 91 00 – Paints & Coatings

1.3 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.4 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.
- B. Refer to physical mock-up requirements in Quality Assurance section below.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.
- B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Remodel mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.
- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. Product Warranty: Limited, non-pro-rated product warranty.
 - 1. Lap siding: 30 years
 - 2. Trim boards: 15 years

- B. Workmanship Warranty: Application limited warranty for 2 years.

PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Fax: 949-367-4981; Email: [request info \(info@jameshardie.com\)](mailto:requestinfo@jameshardie.com); Web: www.jameshardiepros.com.

2.2 SIDING AND TRIM

- A. Fiber-cement siding materials:
1. Fiber-cement siding - complies with ASTM C 1186 Type A Grade II.
 2. Fiber-cement siding - complies with ASTM E 136 as a noncombustible material.
 3. Fiber-cement siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
 4. CAL-FIRE, Fire Engineering Division Building Materials Listing - Wildland Urban Interface (WUI) Listed Product.
 5. ICC-ES evaluation reports ESR-2290, ESR-1844, and ESR-2273 (IBC, IRC, CBC, CRC)
- B. Lap Siding, Basis of Design: HardiePlank HZ10 Lap as manufactured by James Hardie Building Products, Inc.
1. Type: Select Cedarmill 5-1/4 inches (133 mm) with 4 inches (102 mm) exposure.
- C. Trim, Basis of Design: HardieTrim HZ10 boards as manufactured by James Hardie Building Products, Inc.
1. Texture: Wood Grained.
 2. Length: 12 feet (3658 mm).
 3. Thickness: 3/4 inch (19 mm).
 4. Thickness: 1 inch (24 mm).

2.3 FASTENERS

- A. Wood Framing Fasteners: corrosion resistant siding nails as recommended by manufacturer and as set forth in code compliance reports for the installation application.
- B. Metal Framing/Furring Fasteners:
1. Self-drilling, corrosion resistant ribbed buglehead screws as recommended by manufacturer and as set forth in code compliance reports for the installation application.
 2. Secure Architect's approval for use of pneumatic fasteners.

2.4 FINISHES

- A. Factory Primer: Provide factory applied universal primer.
1. Primer: Factory primed by James Hardie.
- B. Topcoat: Refer to Section 09 91 00 and Exterior Finish Schedule.

EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If framing, substrate, and weather barrier preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Correct any surface conditions detrimental to proper application of siding system.

3.2 INSTALLATION - LAP SIDING

- A. Install materials in strict accordance with manufacturer's installation instructions.
- B. Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.
- C. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.
- D. Install siding boards in longest lengths possible with as few joints as possible within any given wall plane.
- E. Strictly follow manufacturer's requirements with respect to board joint/splice locations relative to fastening supports and openings.
- F. Maintain clearance between siding and adjacent finished grade.
- G. Refer to code compliance reports and manufacturer's technical resources for proper fastener selection and fastening schedules for various wind load requirements and framing conditions.

3.3 INSTALLATION - TRIM

- A. Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.
- B. Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.
- C. Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.
- D. Maintain clearance between trim and adjacent finished grade.
- E. Refer to the Drawings for inside and outside corner conditions.
- F. Allow 1/8 inch gap between trim and siding.
- G. Seal gap with high quality, paint-able caulk.
- H. Shim frieze board as required to align with corner trim.

3.4 FINISHING

- A. Finish factory primed siding in accordance with Section 09 91 00 within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 07 46 46

GENERAL

1.1 SUMMARY

- A. Provide and install a fully adhered single-ply membrane roof system with PVC clad flashing and all other incidental and accessory items over the roof as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.
- B. The roofing contractor shall submit all required items in one comprehensive package. This package includes:
 - 1. Copies of specification.
 - 2. Samples of the major components (i.e., membrane, insulation and flashing) of the roofing system.
 - 3. The JM PVC roofing systems printed product data.
 - 4. Specimen copies of the JM Guarantee.
 - 5. Dimensioned shop drawings of the roof including building height.
 - 6. Evidence of roofing manufacturer's JM approval status.

1.4 QUALITY ASSURANCE

- A. Acceptable Manufacturers
 - 1. The single ply membrane roofing system and materials listed herein is as manufactured by Johns Manville (JM).
 - 2. The roofing contractor must be authorized by JM to install PVC roofing systems.
 - 3. The roofing contractor must have been trained by a technical representative of JM and be familiar with the PVC roofing product.
 - 4. The roofing contractor shall submit the completed Pre-Installation Notice (PIN) to the JM Technical Services Department for acceptance before ordering material.
 - 5. No deviations shall be made from this specification or PVC roofing systems detail drawings without prior written authorization from the JM Technical Services Department.
 - 6. Upon completion of the installation, and after written notification to JM that all work has been completed in strict accordance with the contract specifications and the JM requirements, a guarantee evaluation shall be made by a representative of JM for the purpose of determining whether the system installed meets the JM requirements to issue the Guarantee.
- B. Requirements of Regulatory Agencies

- C. The roofing system shall be in compliance with Factory Mutual Engineering Association Roof Assembly Classifications, FM Construction Bulletin I-29, Class I Construction, and shall have a Class 'A' UL Fire Rating Approval listing in the 1984 UL Referral Directory.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be delivered to the job site in original, unbroken packages bearing the manufacturer's label. All materials, other than membrane, shall be stored between 50°F and 80°F. Should they be exposed to a lower temperature, restore to room temperature prior to use. Place all materials on pallets and protect from moisture. Do not use materials damaged in handling or storage.

1.6 JOB CONDITIONS

- A. PVC roofing systems materials may be installed under certain adverse weather conditions such as extremes of high and low temperatures, or high humidity conditions but only after consulting the JM Technical Services Department since special precautions may have to be applied. Installation costs, production rates and material performance may be affected by the foregoing conditions.
- B. Only as much new roofing as can be made weathertight each day shall be installed each day. This includes all flashing work.
- C. Any substrate to receive new insulation, membrane or flashing shall be thoroughly dry. Should surface moisture occur, the contractor shall provide adequate equipment to dry to substrate.
- D. Prior to and during application, the contractor shall ensure that all dirt, debris and dust shall be removed from surfaces to be roofed for both new and reproofing substrates.
- E. Precautions shall be taken to prevent wind blow-off or wind damage during the course of the roofing application. This may necessitate additional securing of temporary construction.
- F. Temporary waterstops shall be installed at the end of each workday or if inclement weather conditions dictate. These temporary waterstops shall be removed at the start of the next workday and disposed of properly.
- G. Do not install the PVC roofing membrane in direct contact with any product containing asphalt, coal tar pitch, creosote, or other harmful materials.
- H. Do not allow waste products containing petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc. or direct steam venting to come into direct contact with the PVC Roofing Membrane. Contact the JM Technical Services Department for recommendations if such conditions exist.
- I. The contractor shall follow all safety regulation as recommended by OSHA.
- J. All work shall be scheduled and executed without exposing interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks. Arrange work sequences to avoid use of newly constructed roofing for storage, walking surfaces and equipment movement. Contractor shall provide all necessary protection and barriers to segregate the work areas and prevent damage to adjacent areas. If excessive foot traffic over newly installed membrane is necessary, contractor shall provide plywood or polyester felt protection to prevent damage.
- K. All existing roof materials to be removed for construction shall be immediately removed from the construction site to a dumping area authorized to receive such debris.

- L. Any unusual or concealed conditions discovered during the course of the work is to be reported to the owner or their representative immediately in writing and work shall be halted until the owner or their representative has responded with a solution to the problem.
- M. When a system is specified to meet an Underwriter's Laboratories, Inc. rating, all materials used in the system must be UL labeled and approved for use for that particular system.
- N. All local building codes and requirements must be followed where applicable. It is the sole responsibility of the roofing contractor to determine any and all local building code requirements and to ensure that the roofing system selected complies with such requirements.
- O. Certain project conditions may require some modifications to this specification. Contact the JM Technical Services Department if any of the following conditions exist:
 - 1. Geographical location in wind exposure Zone 3, or higher, per the Factory Mutual current edition of Loss Prevention Data Sheet 1-28.
 - 2. Geographical location in a 100 mph (161 km/hr) or greater wind zone, per the ANSI 100 year mean recurrence interval wind isotach.
 - 3. Location with a "D" exposure as determined in ASCE 7.
 - 4. Buildings with high internal humidity, such as swimming pools, textile mills, paper mills, etc.
 - 5. Buildings which are highly pressurized or have the potential for high internal pressures.
- P. If a roof contractor desires to solvent-weld certain details, it is their sole responsibility to ascertain local VOC requirements in force and verify that it is acceptable to use solvent for making seams at these detail areas.

1.7 GUARANTEE

- A. The roofing contractor shall furnish to the Owner the manufacturer's fifteen (15) year, no dollar limit guarantee, covering both labor and materials.
 - 1. Total Warranty Period: 15 years.
 - 2. Fifteen-Year Guarantee shall be a 100 percent, full value guarantee and shall not limit the cost to the original installation cost. Guarantee shall cover the entire system with no exceptions.
 - 3. This guarantee shall cover full replacement costs involved in the event of a problem, regardless of the dollar amount during those 15 years, and shall also cover all necessary repairs during the fifteen-year period.
- B. Long-term performance of a roofing system depends on an adequate ongoing maintenance program. JM requires building owners to establish regularly scheduled annual inspections to ascertain the condition of the roofing system and to perform those maintenance items required to keep the roofing system performing properly. Records of all maintenance work performed must be retained for the entire warranty period. Please consult JM for specific recommendations.

PRODUCTS

2.1 ROOFING SYSTEM:

- A. Single ply membrane roofing system shall be PVC Fully Adhered Roofing System as manufactured by Johns Manville. Color shall be white.

2.2 MATERIALS:

A. ROOFING MEMBRANE

1. SR-60 Fully Adhered Roofing Membrane 60 mils (1.5 mm) nominal thickness.
 2. PVC Membrane shall equal or exceed the minimum physical properties published in the PVC Roofing Systems product data sheets.
- B. Gypsum Roof Panels: Dens-Deck Gypsum Roof Board as manufactured by Georgia Pacific Corporation or equal.
- C. Solvent: PVC Solvent Welding Solution shall be furnished with the label attached.
- D. Seam or Lap Sealant: PVC Sealant shall be a liquid PVC sealing compound, and shall have a consistency equal to that of "honey" at room temperature.
- E. Caulk: PVC Polyurethane Caulk is a single component, non-sag, elastomeric polyurethane sealant.
- F. Adhesive: PVC Membrane Adhesive shall be used for bonding the PVC flashing membrane to vertical substrates of wood, metal and concrete,
- G. Aluminum Tape: PVC roofing systems supplied Aluminum Tape shall be a 3 mil (0.08 mm) tape with acrylic adhesive used over PVC-Clad Metal joints prior to PVC roofing systems DM-80 strips being welded over the joints.
- H. Slipsheets: 9 oz. Per sq. yd. (0.30kg/m²) Polyester Mat Protection Material- needle-punched polyester fabric.
- I. PVC Membrane Cleaner –PVC Membrane Cleaner is a clear liquid used for cleaning asphalt and dirt from membrane surface.
- J. Flashing Membrane: SR-60.
- K. Flashing Metal: PVC-Clad Metal is 24 gauge (0.61 mm) galvanized steel laminated to 40 mils (1.0 mm) of nonreinforced membrane in soft white color used for flashing and edge metal detailing.
- L. Termination Bar: The Termination Bar shall be an extruded aluminum bar 3/32" (3 mm) thick used to terminate adhered, reinforced membrane base flashings in certain constructions.
- M. Membrane Fasteners and Plates: PVC roofing systems offers a variety of membrane and insulation fasteners and plates to meet specific job conditions and substrates.
- N. Prefabricated Details: PVC Inside/Outside Corners, PVC Vent Pipe Boots in sizes to fit pipes from ¾" – 11" (20 mm – 275 mm), and PVC Penetration Pans shall be used.
- O. PVC-Clad Metal Joint Cover Strips: for use in waterproofing joints of PVC-Clad Metal.
- P. PVC 7" (175 mm) Disc Caps: Are prefabricated round pieces of membrane for use in the PVC disc-cap method of installation to cover the steel plates and fasteners used to secure the membrane to the roof through the top of the sheet.
- Q. Wood Nailers: Nailers shall be #2 or better lumber. Nailers shall be pressure treated for rot resistance (wolmanized or osmose treated). Creosote and asphaltic preservatives are not acceptable.

2.3 PRECAUTIONS

- A. Do not use PVC roofing systems products near fire or flame.

- B. Avoid breathing vapors of solvent, sealant and adhesives. Use adequate ventilation. Avoid prolonged contact of solvents, sealants and adhesives with skin.
- C. Do not use open flames to expedite drying of surfaces, sealants or adhesives.
- D. Consult Material Safety Data Sheets and container labels for specific safety instructions. MSDS sheets are available by calling the JM Product Information Center at 1-800-654-3103 or through the JM Fax Express at 1-888-329-3977.
- E. Do not paint PVC-Clad Metal or membrane with oil-based paint. Consult the JM Technical Services Department for Recommendations.
- F. Do not allow muriatic acid used to clean masonry to come in direct contact with the Roofing Membrane.

EXECUTION

3.1 INSPECTION:

- A. Verify that work penetrating deck has been completed to extent that single ply membrane roofing can be applied.
- B. Examine decks for inadequate anchorage, moisture and unevenness which would affect quality installation of roofing materials.
- C. Do not proceed with installation of roofing until defects are corrected.

3.2 APPLICATION:

- A. Gypsum Board: Adhere roof boards to plywood sheathing in strict accordance with manufacturer's instructions.
- B. Roofing Membrane:
 - 1. General: The JM PVC Roofing Membrane shall only be applied over compatible, clean, dry and smooth surfaces in accordance with the JM PVC Detail Drawings. The application shall begin at the highest elevation and continue to the lowest elevation of each individual roof. The seams shall be overlapped in the direction of the slope of the roof. Except where no other alternative exists, good roofing practice dictates that the sheets should be laid shingle fashion, against the slope, so that the seams avoid backwater laps.
- C. Water Cutoffs: Water cutoffs shall be made by extending the membrane beyond the gypsum board and setting the end of the membrane in 6 inches of plastic roofing cement. All temporary water cutoffs shall be removed prior to proceeding with the next work period by cutting off that portion of the membrane that has been in contact with plastic roofing cement and disposing of it.
- D. PVC Coated Metal Flashing: PVC coated metal flashing shall be installed at the intersections of roofs with sloped or vertical surfaces, roof interruptions and penetrations, in accordance with the currently published drawings, consistent with job conditions or drawings, and approved by the manufacturer.
 - 1. Base flashing shall extend up vertical surfaces a minimum of 8 inches and onto the horizontal roof surfaces not less than 3 inches except as may be shown otherwise. Metal base flashings shall be installed at locations by nailing to wood nailers. All PVC laminated metal flashings shall be provided with 2 inches minimum overlap of the roofing membrane, solvent welded in the horizontal plane, with subsequent sealing by sealing compound.

- E. Flashings for Roof Fixtures: All flashings for pipes, conduits, scuppers, equipment supports, pitch dams, pitch pockets, etc. shall be installed to conform to the requirements of the roofing membrane manufacturer's details and to the details shown on the Drawings.

3.3 CLEAN-UP

- A. Upon completion of the work, remove all sealants and cements from surfaces other than those requiring single ply membrane roofing. Remove all surplus material, rubbish and debris resulting from work of this Section.

END OF SECTION 07 54 19

GENERAL

1.1 SUMMARY

- A. Provide and install all flashing and sheet metal not specifically described in other Sections of these Specifications but required to prevent penetration of water through exterior shell of the buildings and all sheet metal flashing and caps as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

1.4 QUALITY ASSURANCE

- A. All sheet metal work shall be fabricated and installed per the standard details and specifications as illustrated in Sheet Metal Manual by Sheet Metal and Air Conditioning National Association, Inc. (SMACNA).

PRODUCTS

2.1 GUTTERS

- A. 24-gauge galvanized sheet metal. Provide profile as shown on the Drawings.

2.2 GUTTER LEAF GUARD

- A. Provide stainless steel micro-mesh LeafBlasterPro leaf guards as manufactured by Gutterglove on all gutters in widths as required. Install to gutter bead with both positive screw attachments and continuous silicone sealant. Provide with 40-year Warranty.

2.3 DOWNSPOUTS AND BRACKET

- A. 3"x4" 24-gauge galvanized iron smooth (non-ribbed) type. Provide pipe clip type brackets; SMACNA Figure 1-35A.

2.4 MATERIALS AND GAUGES

- A. Where sheet metal is required and no material or gauge is indicated on the Drawings, furnish and install the highest quality and gauge commensurate with the referenced standards. All miscellaneous sheet metal shall be galvanized.

2.5 GALVANIZED IRON

- A. Sheet metal or iron shall be standard brand of open-hearth copper-bearing steel, copper-molybdenum iron, or pure iron sheets.
- B. Zinc coating
 - 1. All galvanized sheets shall have a zinc coating applied by hot-dip process to all surfaces.
 - 2. Zinc coating shall weigh not less than 1-1/4 ounces per square foot nor more than 1-1/2 ounces per square foot of surfaces covered and shall conform with ASTM A-93.

2.6 NAILS, RIVETS, AND FASTENERS

- A. Use only soft iron rivets having rust-resistive coating, galvanized hot-dipped nails, and cadmium plated screws and washers in connection with galvanized iron and steel.

2.7 FLUX

- A. All flux used for galvanized iron or steel shall be raw muriatic acid.

2.8 SOLDER

- A. All solder used on galvanized sheet steel shall conform with the current ASTM B-32.

2.9 REGLETS

- A. 24-gauge galvanized iron as shown on the Drawings. Design of reglets (counter flashing) is based on Architectural Sheet Metal Manual (SMACNA) Figure 4-4D or as shown on the Drawings. All reglets shall be those upon which the design was based, or equals approved by the Architect in accordance with the provisions of Section 01 33 23 of these Specifications.

2.10 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of flashing and sheet metal, shall be new, first quality of their respective kinds and subject to the approval of the Architect.

EXECUTION

3.1 WORKMANSHIP

A. General

1. Form all sheet metal accurately to the dimensions and shapes required, finishing all molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit and soldering securely.
2. Unless otherwise specifically permitted by the Architect, turn all exposed edges back 1/2 inch.

- B. Expansion: Form, fabricate, and install all sheet metal so as to adequately provide for expansion and contraction in the finished Work per SMACNA standards.

C. Weatherproofing

1. Finish watertight and weather tight where so required.
2. Make all lock seam work flat and true to line and sweated full of solder.
3. Make all lock seams and lap seams, when soldered, at least 1/2 inch wide.
4. Where lap seams are not soldered, lap according to pitch but in no case less than three inches.
5. Make all flat and lap seams in direction of flow.

D. Joints

1. Join parts with rivets or sheet metal screws where necessary for strength or stiffness.
2. Provide suitable watertight expansion joints for all runs of more than 40 feet except where closer spacing is indicated on the Drawings or required for proper installation.

E. Nailing

1. Whenever possible, secure metal by means of clips or cleats without nailing through the metal.
2. In general, space all nails, rivets, and screws not more than eight inches apart, and, where exposed to the weather, use lead washers.
3. For nailing into wood, use barbed roofing nails 1-1/4 inches long by eleven gauge.
4. For nailing into concrete, use drilled plugholes and plugs.

3.2 EMBEDMENT

- A. Embed all metal in connection with roofs in a solid bed of caulking, using materials and methods described in Section 07 92 00 of these Specifications.

3.3 SOLDERING

A. General

1. Thoroughly clean and tin all joint materials prior to soldering.
2. Perform all soldering slowly with a well heated copper in order to heat the seams thoroughly and to completely fill them with solder.
3. Perform all soldering with a heavy soldering copper of blunt design, properly tinned for use.
4. Make all exposed soldering on finished surfaces neat, full, flowing, and smooth.

B. Cleaning

1. After soldering, thoroughly wash acid flux with a soda solution.

3.4 TESTS

- A. At the completion of the job, demonstrate to the Architect by hose or standing water that all flashing and sheet metal is completely watertight.

END OF SECTION 07 62 00

GENERAL

1.1 SUMMARY:

- A. Provide and install sheet metal roof specialties:
 - 1. Factory-finished chimney shroud
- B. Related Specification Section: 10 31 00 Manufactured Gas Fireplaces

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

1.4 QUALITY ASSURANCE:

- A. Chimney shroud shall be UL listed and labeled for the project specific application.

PRODUCTS

2.1 BASIS OF DESIGN

- A. Manufacturer: American Chimney Shroud: www.americanchimneyshroud.com
- B. Design: S48
- C. Material: 24 ga. hot-dipped galvanized sheet metal
- D. Finish: Kynar 500 factory-applied color, selected from manufacturer's standards
- E. Mounting style: flush, or as detailed on the Drawings
- F. Size: as dimensioned on the Drawings
- G. Termination: single flue, direct vent
 - 1. Coordinate with vent pipe specified in Section 10 31 00

EXECUTION

3.1 COORDINATION WITH OTHER WORK

- A. Provide shop drawings and mounting details coordinated with architectural drawings and chimney construction. Field-verify as-built chimney dimensions before fabrication of shroud.

3.2 INSTALLATION

- A. Install chimney shroud in accordance with manufacturer's instructions to ensure watertight condition.

END OF SECTION 07 71 00

GENERAL

1.1 SUMMARY

- A. Install firestopping at all penetrations through rated walls as indicated on the Drawings, or as may be required by penetrations.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 30 00 of these specifications.

1.4 SECTION REQUIREMENTS

- A. Provide firestopping systems with fire-resistance ratings indicated by reference to UL designations as listed in its "Fire Resistance Directory," or to designations of another testing agency acceptable to authorities having jurisdiction.
- B. Provide through-penetration firestopping systems with F-ratings indicated, as determined according to ASTM E 814, but not less than fire-resistance rating of construction penetrated.
 - 1. Provide through-penetration firestopping systems with T-ratings as well as F-ratings, as determined according to ASTM E 814, where indicated.
- C. For exposed firestopping, provide products with flame-spread indexes of less than 25 and smoke-developed indexes of less than 450, as determined according to ASTM E 84.

PRODUCTS

2.1 FIRESTOP SYSTEMS

- A. Any through-penetration firestop system that is classified by UL for the application and with F-rating indicated may be used.

EXECUTION

3.1 INSTALLATION

- A. Install firestopping systems to comply with requirements listed in testing agency's directory for indicated fire-resistance rating.
- B. Identification: Identify through-penetration firestop systems with permanent labels attached to surfaces adjacent to firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
 - 1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb."
 - 2. Classification/listing designation of applicable testing and inspecting agency.
 - 3. Through-penetration firestop system manufacturer's name and product name.

END OF SECTION 07 84 13

GENERAL

1.1 SUMMARY

- A. Provide a positive barrier against penetration of air and moisture at joints between items where sealing is essential to continued integrity of the barrier. Such sealing will normally be performed under the work of various Sections of these Specifications but shall be performed in strict accordance with the provisions of this Section. Install as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.
- B. Samples: Submit three 12" long samples of each color required (except black) for each type of sealant exposed to view.

1.4 AIR POLLUTANT CONTROL REQUIREMENTS

- A. Per Section 5.504.4.1 of the 2013 California Green Building Standards Code, sealants and caulks used on the project shall meet the requirements of the following standards:
 - 1. 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 Table 5.504.4.2 of the 2013 California Green Building Standards Code. 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).

PRODUCTS

2.1 SEALANT MATERIALS

- A. Vertical Surfaces, Hybrid Sealant
 - 1. MasterSeal NP 150 low-modulus, non-sag premium-grade elastomeric hybrid sealant by Master Builders Solutions (BASF Corporation), or equal. Color selected by architect.
- B. Horizontal Concrete Joints
 - 1. MasterSeal SL2 two-component polyurethane sealant by Master Builders Solutions (BASF Corporation), or equal. Color selected by architect.
- C. Backing Material
 - 1. Cylindrical sealant backings: ASTM C1330, type as recommended in writing by sealant manufacturer for joint application indicated and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 2. Bond breaker tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.2 SEALANT EQUIPMENT

- A. All equipment shall be only such equipment as is specifically recommended by the manufacturer of the sealant material being installed.

EXECUTION

3.1 CHOICE OF SEALANT MATERIAL

- A. Use only that sealant material which is best suited to the installation and is so recommended by the sealant material manufacturer.

3.2 GENERAL

- A. Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

3.3 BACK-UP MATERIALS

- A. General
 - 1. All joints over 3/8" wide shall have back-up filler.
 - 2. Verify the compatibility of filler material with sealant before installation.
 - 3. Use back-up filler about 1/3 to 1/2 wider than width of joint so sufficient pressure is exerted by filler to provide substantial resistance to displacement.
- B. Acceptable materials
 - 1. All filler materials shall be non-oily, non-staining back-up filler such as polyethylene foam rod, expanded polyurethane, neoprene, or other filler completely compatible with the sealant material.

3.4 APPLICATION OF SEALANT

- A. General: Do not seal under weather conditions or sun conditions potentially harmful to the set and curing of the sealant material.
- B. Preparation: Clean joint surfaces immediately before installation of sealant. Remove dirt, insecure coatings, moisture and other substances which could interfere with bond of sealant. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous and glazed joint surfaces as recommended by sealant manufacturer.
- C. Priming: Prime joint surfaces where recommended by sealant manufacturer. Do not allow primer to spill or migrate onto adjoining surfaces.
- D. Installation: Install sealant in strict accordance with the manufacturer's recommendations, taking care to produce beads of proper width and depth, tool as recommended by the manufacturer, and immediately remove all surplus sealant.
 - 1. Where an irregular surface or sensitive joint border exists apply masking tape at edges of joint to insure neatness and protection. Remove masking tape prior to sealant setting.
 - 2. Spillage: Do not allow sealants or primers to overflow or spill onto adjoining surfaces, or migrate into voids of adjoining surfaces. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

3.5 SEALANT SCHEDULE

- A. Carefully study the Drawings and furnish and install the proper sealant at each point where called for on the Drawings plus at all other points where sealing is essential in maintaining the continued integrity of the water-tight barrier including but not limited to:
1. Exterior expansion and control joints.
 2. Exterior sills, jambs and heads of window frames, door frames, louvers and similar openings, and where metal, wood or other materials abut or join masonry, concrete or other materials.
 3. Exterior horizontal control and expansion joints in concrete slabs, masonry, precast paving units and tiles.
 4. Interior expansion and control joints.
 5. Interior horizontal control and expansion joints in concrete slabs and tile flooring.

END OF SECTION 07 92 00

GENERAL

1.1 SUMMARY

- A. Provide and install hollow metal doors, frames, and frame components such as sidelites and borrowed lites as shown on the Drawings and specified herein.
- B. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
 - 2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
 - 3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
 - 4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
 - 5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
 - 6. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
 - 7. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 8. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 9. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - 10. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
 - 11. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 12. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Doors Under Specified Pressure Differences Across the Specimens.
 - 13. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 14. ASTM E 413 - Classification for Rating Sound Insulation.
 - 15. ASTM E1332 - Standard Classification for Determination of Outdoor-Indoor Transmission Class.
 - 16. ASTM E1886 - Test Method for Performance of Exterior Windows, Curtin Walls, Doors and Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
 - 17. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.
 - 18. ANSI/NAAMM/HMMA 867-06 - Guide Specifications for Commercial Laminated Core Hollow Metal Doors and Frames.
 - 19. ANSI/BHMA A156.15 - Hardware Preparation in Steel Doors and Frames.

20. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
21. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
22. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
23. FEMA 361 2008 – Design and Construction Guidance for Community Safe Rooms.
24. ICC 500 - ICC/NSSA Standard for the Design and Construction of Storm Shelters.
25. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
26. TAS-201-94 - Impact Test Procedures.
27. TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
28. TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
29. UFC 4-010-0 - Department of Defense Minimum Antiterrorism Standards for Building, October 2003, including Change 1, January 2007.
30. UL 10B - Fire Test of Door Assemblies.
31. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
32. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.
 7. Details of moldings, removable stops, and glazing.
 8. Details of conduit and preparations for power, signal, and control systems.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

- B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40" above sill) or UL 10C.
- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CECO Door Products.
 - 2. Curries Company.
 - 3. Security Metal Products.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Provide 1-3/4-inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
- B. Exterior Doors: Face sheets fabricated of 16-gauge commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
 - 1. Basis of Design: Flush panel; CECO Legion Services Full Flush Door.
 - 2. Core Construction: Manufacturer's standard polystyrene. Where indicated, provide doors fabricated as thermal-rated assemblies with a minimum R-value of 2.8 or better.
 - 3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
 - 4. Hinge Reinforcement: Minimum 7-gauge (3/16") plate 1-1/4" x 9" or minimum 14-gauge continuous channel with pierced holes, drilled and tapped.
 - 5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- C. Interior Doors: Face sheets fabricated of 18-gauge commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
 - 1. Basis of Design: Flush panel; CECO Regent Services Full Flush Door.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
 - 3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
 - 4. Hinge Reinforcement: Minimum 7-gauge (3/16") plate 1-1/4" x 9" or minimum 14-gauge continuous channel with pierced holes, drilled and tapped.
 - 5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

2.4 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

- B. Exterior Frames: Fabricated of 16 gauge hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
 - 1. Fabricate frames with mitered or coped corners.
 - 2. Fabricate frames, with "closed and tight" miter seams continuously welded on face, finished smooth with no visible seam unless otherwise indicated.
 - 3. Manufacturers Basis of Design:
 - a. CECO Door Products SQ/SU/SR Series.
 - b. Curries Company M/G Series.
- C. Interior Frames: Fabricated from 16 gauge cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 - 1. Fabricate frames with mitered or coped corners.
 - 2. Fabricate frames with "closed and tight" miter seams continuously welded on face, finished smooth with no visible seam unless otherwise indicated.
 - 3. Frames for Borrowed Lights: Minimum 16 gauge (0.053-inch-1.3-mm-) thick steel sheet.
 - 4. Manufacturers Basis of Design:
 - a. CECO Door Products BQ/BU Series (Drywall Profile, welded corners).
 - b. Curries Company CM Series (Drywall Profile, welded corners).
- D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates of minimum steel thickness set forth in ANSI/SDI A250-6 Table 1

2.5 FRAME ANCHORS

- A. Jamb Anchors
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042-inch-thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 HOLLOW METAL PANELS

- A. Provide hollow metal panels of same materials, construction, and finish as specified for adjoining hollow metal work.

2.7 LOUVERS

- A. Metal Louvers: Door manufacturer's standard metal louvers unless otherwise indicated.
 - 1. Blade Type: Vision proof inverted V or inverted Y.

2. Metal and Finish: Galvanized steel, 0.040-inch-thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.8 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.
- E. Glazing: Comply with requirements in Division 08 Section "Glazing" and with the hollow metal door manufacturer's written instructions.
 1. Factory Glazing: Factory install glazing in doors as indicated. Doors with factory installed glass to include all of the required glazing material.

2.9 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.10 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors
 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
 2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
 3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
 4. Continuous Hinge Reinforcement: Provide welded continuous 12-gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge location.
5. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening”.
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - (1) Two anchors per jamb up to 60 inches high.
 - (2) Three anchors per jamb from 60 to 90 inches high.
 - (3) Four anchors per jamb from 90 to 120 inches high.
 - (4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - (1) Three anchors per jamb up to 60 inches high.
 - (2) Four anchors per jamb from 60 to 90 inches high.
 - (3) Five anchors per jamb from 90 to 96 inches high.
 - (4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - (5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware".
 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.11 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
 1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames".
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors.
 - a. Jambs and Head: **1/8 inch** plus or minus **1/16 inch**.
 - b. Between Edges of Pairs of Doors: **1/8 inch** plus or minus **1/16 inch**.
 - c. Between Bottom of Door and Top of Threshold: Maximum **3/8 inch**.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum **3/4 inch**.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTMENT AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 08 11 13

GENERAL

1.1 SUMMARY

- A. Exterior and interior aluminum wood multi-slide doors as described on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 REFERENCES

- A. AAMA 611.98 - Voluntary Specification for Anodized Architectural Aluminum.
- B. AAMA 2603.02 - Voluntary Specifications, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- C. AAMA 2604 - Voluntary Specifications, Performance Requirements and Test Procedures for Pigmented for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- D. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Material Used In Buildings.
- E. ASTM E 283 - Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- F. ASTM E 330 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- G. ASTM E 547 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
- H. CPSC 16CFR-1201 - Safety Standard for Architectural Glazing Materials.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Include outside net frame dimensioning, direction of swing (outswing or inswing), number of panels, folding configuration of panels left or right, identify main entry swing panel, typical head, side jamb, sill and panel details and type of glazing material per vertical plan and elevations view drawings.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

- G. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic checking and adjustment of cable tension and periodic cleaning and maintenance of all railing and infill components.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide complete, engineered and high quality sliding door system by a single source manufacturer with at least 7 years documented experience manufacturing folding door systems in the U.S.
- B. Installer Qualifications: Installer with documented experienced in the installation of manufacturer's sliding door systems or similar and screen system to the products specified.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect stored product from damage. Store products flat in dry, well ventilated area out of direct sunlight, under cover, protected from weather, moisture and excessive dryness and construction activities.

1.7 SEQUENCING

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

- A. Manufacturer's limited warranty including; 10 years for panel and frame aluminum components, product finishes, folding system hardware, and weather stripping; 5 years for locking hardware and screens; 10 years for insulated glass against failure of the air seal and that each unit will be free from material obstruction of vision as a result of fogging or film formation on the internal surfaces.

PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: LaCantina Doors, Inc., 1875 Ord Way, Oceanside, CA 92056. ASD. Telephone: (888) 221-0141. Fax: (760) 734-1591. Website: www.lacantindoors.com. Email: info@lacantindoors.com.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 62 00.

2.2 SLIDING ALUMINUM-WOOD DOORS

- A. Aluminum Wood Multi Slide Doors: Hybrid panel construction of 1-3/4 inch thick extruded aluminum and 1/2 inch thick solid wood on the interior.
 - 1. Configuration:

- a. Stacking Configurations: Complete sliding door system including head, side jambs, thresholds and aluminum sliding panels to the following sizes.
 - (1) 4 Panels XXXO as indicated on the Drawings. Maximum Frame Width 31 feet 6-3/4 inches by Maximum Frame Height 12 foot 3-1/16 inches.
2. Frame and Panels: Complete folding door system including head, side jambs, thresholds and aluminum panels to sizes indicated on the Drawings.
 - a. Panel: Thermally broken, extruded aluminum stile and rail panels with standard one lite.
 - (1) Stile and Rail 3-5/8 inches (92 mm).
 - b. Frame and Sill: Extruded aluminum.
 - c. Weatherstripping: At exterior doors, provided weather seal inserted in frame and sill to provide perimeter seal, as well as between door panels. Color is dark bronze.
 - d. Interior Wood Species: Provide with matching solid wood glazing stops.
 - (1) Vertical grain Douglas Fir.
 - e. Interior Wood Finish: Unfinished, ready for paint or stain.
3. Glass: All glass to comply with safety glazing requirements of ANSI Z97.1 and CPSC 16CFR 1201.
 - a. Type: Cardinal dual glazed low-E glass.
 - (1) Insulated glass with a 3/4 inch (19 mm) overall thickness.
 - b. Glass:
 - (1) Air Filled:
 - (a) LowE366-Air-Clear: Overall Thickness 3/4 inch, U-Factor 0.52, SHGC 0.23, VT 0.49
 - c. Glazing: Silicone bedding on exterior surfaces and glazing seal on the interior of the panel.
4. Locking Hardware and Handles: Manufacturer's standard minimal one piece handle and exterior locking hardware.
 - a. Provide with optional three point lock system available for systems 8 feet or taller with locking hardware located on the primary sliding panel.
 - b. Handle Finish:
 - (1) Brushed Satin Bronze color.
 - c. Provide panel handle height centered at 36 inches (914 mm) from bottom of panel.
5. Rolling Hardware: Manufacturer's standard rolling hardware integrated with engineered head track, side jambs and threshold frame system.
 - a. Rolling Hardware:
 - (1) Stainless steel wheels.
 - b. Threshold:
 - (1) Flush sill.

6. Interior Wood Species: Provide with matching solid wood glazing stops.
 - a. Vertical grain Douglas Fir.
7. Interior Wood Finish: Unfinished, ready for paint or stain.
8. Aluminum Finish:
 - a. Two coat 70 percent Kynar finish with color as selected from manufacturer range of finishes.
9. Threshold Finish:
 - a. Bronze anodized.

2.3 FABRICATION

- A. Sizes and Configurations: Fabricate to sizes and configurations indicated on the Drawings. Verify opening sizes by field measurement prior to completing fabrication.
- B. Verify sliding direction for opening units.
- C. Fabricate with manufacturer's non-integral nail fin for use in conjunction with standard flashing, weather resistant barriers and compatible sealants.

EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that the maximum deflection of the header with the live load does not exceed the lesser of $L/720$ of the span and 1/4 inch. Structural support for lateral loads including both wind load and when the panels are stacked open) must be provided.
- C. Verify that dimensions of rough opening will fit the net frame dimensions of door system; verify that rough openings are level, plumb, and square, with no unevenness in the floor.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Properly flash and waterproof around the perimeter of the opening and frame. Adequate overhangs to prevent the effects of sheeting water from above are recommended.
- C. Provide adequate anchorage devices. Securely fit frame in place, level, straight, plumb and square. Install frame in proper elevation, plane and location, and in proper alignment with other work. Head section of frame must be installed with a 1/8 inch upward crown at the center of the opening.
- D. If necessary for tracks recessed into finish floors, drill weep holes in the floor track and provide drain connectors to ensure water can escape from the tracks.
- E. Ensure doors are adjusted for proper operation.

- F. For products requiring field finishing, field as specified in Section 09900; seal and finish promptly after installation and no more than seven days and prior to exposure to weather.
- G. Install the screen system following the manufacturer's recommendations and installation instructions.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Protect installed product from construction activities, particularly thresholds and floor channels.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 08 13 73

GENERAL

1.1 SUMMARY

- A. Provide and install stile and rail wood doors as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.
 - 1. Product Data, including details of construction Submit (1) 12" X 12" construction sample as required by the architect showing door construction, panel and sticking details as specified.
 - 2. For factory finished doors-Submit (3) 5" X 5" veneer samples as required by the architect illustrating finish color and sheen.
 - 3. Safety Glass: Comply with testing requirements in 16 CFR 1201.
 - 4. Forest Certification: Provide doors produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria".

PRODUCTS

2.1 MANUFACTURER

- A. Masonite Architectural: 1.877.332.4484 and www.masonitearchitectural.com
 - 1. Basis of Design Product: Subject to compliance with requirements, provide Aspiro™ Series Authentic Stile & Rail wood doors or Architect approved Equal.

2.2 DOOR CONSTRUCTION

A. Description: Interior Non-Rated Doors

- 1. Type: Aspiro™ Series. Raised Panel style and Full Glass style as indicated on Drawings
- 2. Door Thickness as indicated on Drawings
- 3. Construction Type:
 - a. Cope & Stick; joinery using ½" X 4" dowels.
 - b. Joints to have minimum 1 dowel.
- 4. Construction Materials:
 - a. Stiles and rails shall be constructed of Structural Composite Lumber (SCL) with a minimum ¾" solid hardwood edge.
 - b. Muntin bars shall have ¼" X 2-1/2" dowels at every joint.
 - c. Pressure fit joints using a Type II Adhesive.

- d. Raised panels shall be minimum thickness of 1-1/8" with raise of panel of solid lumber material matching face species, rim banded with mitered corners.
- 5. Veneer: Veneers to be 1/16" thickness, Grade A.
 - a. Species: Cherry
 - b. Quarter cut
 - c. Center match
- 6. Door Panel Top Design:
 - a. Square Top
- 7. Panel Types:
 - a. Veneer Wrapped Raised Panel: 1-1/8"
- 8. Panel Construction
 - a. Panels shall be manufactured with face veneer directly to core material
 - b. Raised panels shall be minimum thickness of 1-1/8" with raise of panel of solid lumber material matching face species, rim banded with mitered corners.
- 9. Panel Material
 - a. Veneer Wrapped Raised Panel: MDF
- 10. Sticking Types:
 - a. Ovolo

B. Description: Interior Fire-Rated Doors

- 1. See Drawings for required door ratings.
- 2. Labeled doors shall confirm to one of the following applicable local codes.
 - a. Positive Pressure—Tested to UL 10C
 - b. Positive Pressure doors are to be of Category A construction. (Category A includes doors evaluated without an edge-sealing system on the door and frame and doors evaluated with a sealing system incorporated (concealed or visible) into the edge of the door.

2.3 DOOR FABRICATION

- A. Fabricate doors in accordance with one of the following Quality Assurance Standards.
 - 1. WDMA I.S.6A-Premium Grade Construction
- B. Veneer to be Grade A unless specified as other
- C. Prefit and bevel doors 1/8" in 2", ensuring proper gaps are maintained on fire doors to comply with NFPA 80 requirements.
- D. All doors shall be machined for specified hardware that is not surface applied.
- E. Doors shall be factory glazed with glass as specified unless otherwise indicated.
 - 1. 1/4" clear tempered

2.4 FINISHING

- A. All doors shall be factory finished with manufacturers' standard Conversion Varnish and standard sheen. (Unless otherwise indicated).

- B. Finish coating to be:
 - 1. Match American Laminates Butternut

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs. Any deficiencies must be corrected prior to door installation.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: See Section Door Hardware
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
 - 1. Install fire-rated doors according to NFPA 80.
 - 2. Install smoke- and draft-control doors according to NFPA 105.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFPA 80 for fire-rated doors.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 at lock and hinge edges.
 - 3. Trim bottom rail only to extent permitted by labeling agency.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Do not trim factory finished doors for width.

3.3 ADJUSTING

- A. Operation: Correct any deficiency that prohibits the door from swinging or operating freely. Do not remove hinge screws after initial insertion. Shims used for alignment purposes must be inserted between hinge and frame. Do not insert shims between hinge and door.
- B. To prevent stile failure, ensure that door closers are properly adjusted and do not limit the door opening swing. Limit door opening swing only with a properly located stop.
- C. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 33

GENERAL

1.1 SUMMARY

- A. Provide and install interior aluminum-framed, top-hung sliding doors as described on the Drawings and specified herein.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 REFERENCES

- A. ANSI – American National Standards Institute
 - 1. ANSI 156.18 Materials and Finishes
 - 2. ANSI A117.1 Specifications for making buildings and facilities usable by physically handicapped people.
- B. BHMA – Builders Hardware Manufacturers Association
- C. DHI – Door and Hardware Institute
- D. NFPA – National Fire Protection Association
 - 1. NFPA 80 – Fire Doors and Windows
 - 2. NFPA 101 – Life Safety code
 - 3. NFPA 105 – Smoke and Draft Control Door Assemblies
 - 4. NFPA 252 – Fire Tests of Doors Assemblies
- E. AWS – Architectural Woodwork Standards

1.4 SUBMITTALS

- A. Comply with Section 01 33 00 – Submittal Procedures
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating dimensions, tolerances, materials, components, hardware, finish, options, and accessories. Shop Drawings to show required blocking by others.
- D. Samples: Submit manufacturer's samples of the following sliding door components:
 - 1. Door veneer or laminate sample.
 - 2. Aluminum Frame finish sample.
- E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- F. Warranty Documentation: Submit manufacturer's standard warranty.
- G. Test Reports: Submit acoustical reports or UL1784 as applicable.

1.5 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of interior aluminum frames and doors.
- B. Source: Obtain sliding aluminum framed doors and hardware from single source.

- C. Manufacturer's Qualifications: Manufacturer regularly engaged for past 5 years in manufacture of sliding doors similar to that specified.

1.6 PERFORMANCE

- A. Aluminum perimeter frames with integral acoustic seals.
- B. Soft self-closing mechanism integrated with top track.
- C. Concealed door guide.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Notify manufacturer immediately of any shipping damage.
- C. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
 - 3. Store materials in clean, dry area indoors.
 - 4. Protect materials and finish during storage, handling, and installation to prevent damage.

PRODUCTS

2.1 MANUFACTURERS

- A. **AD SYSTEMS** 2201 100th St. SW, Everett, WA 98204 | Website: <http://specADsystems.com> | Phone: 425-374-1360 | Attn: Estimating: estimating@specADsystems.com

2.2 INTERIOR SLIDING ALUMINUM-FRAMED DOORS AND PARTITIONS

- A. Manufacturer:
 - 1. Scheduled Manufacturer: OfficeSlide™ High Performance Barn (Sliding) Door System by AD Systems. Or equal
- B. Specified Wall Thickness 7-1/4". Contractor to verify in field
- C. Frame Profiles: Extruded aluminum frame "wrap" frame with integral vertical jamb (stile pocket).
- D. Finish:
 - 1. Standard: Painted Hardcoat (Kynar) Finish. Meets AAMA 2604 Standard Colors: Color as selected by architect
- E. Door Leafs: all Doors to be factory machined for hardware including pilot and function holes.
 - 1. 1-3/4" Flush Wood Door: Reference Spec Section 08 14 16 Wood Doors or other section as applicable.
 - a. Glazing: monolithic clear tempered with integral blinds where indicated on Drawings.

- b. Standard stile widths are 6" with a 10" bottom rail.
- F. Door Components:
 - 1. Single Top Track: AD Systems extruded aluminum track by AD Systems
 - 2. Valances: Extruded aluminum with integral end caps
 - a. Valance painted to match frame
 - 3. Top Rollers: tandem nylon roller sized to match door weight.
 - 4. Concealed Floor Guide: Integral Jamb floor guide by AD Systems.
 - 5. Soft-Closer: Soft and self-closing damper mechanism at both sides of door leaf
 - 6. Pull Handles: 10" BTB wire pull. Refer to Door Hardware Section
- G. Door Locks:
 - 1. Not Required at (1) location as indicated on Drawings
 - 2. Mortise Latch and Lock at (1) location as indicated on Drawings
 - a. Privacy Thumb-turn with Indicator and ext. key

EXECUTION

3.1 EXAMINATION

- A. Examine wall openings to receive sliding doors for plumb, level, and square. Note: Finish door operation will be affected by out of tolerance framing.
- B. Verify dimensions of wall openings.
- C. Examine surfaces to receive top and bottom guide.
- D. Notify Architect of conditions that would adversely affect installation or subsequent use of sliding doors.
- E. Do not begin installation until unacceptable conditions are corrected.
- F. Base of door side shall not be in place at time of installation. Base shall butt frame. Decorative Paneling at Ext side shall be in place at time of installation.

3.2 INSTALLATION

- A. Install sliding doors in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install sliding doors plumb, level, square, and in proper alignment.
- C. Install sliding doors to close against walls without gaps.
- D. Install sliding doors to open and close smoothly.
- E. Anchor sliding doors securely in place to supports. 2 x 6 blocking required full length of track.

3.3 ADJUSTING

- A. Adjust sliding doors for proper operation in accordance with manufacturer's instructions.
- B. Adjust sliding doors to operate smoothly without binding.
- C. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

3.4 CLEANING

- A. Clean sliding doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage materials or finish.

3.5 PROTECTION

- A. Protect installed sliding doors from damage during construction.

END OF SECTION 08 34 00

GENERAL

1.1 SUMMARY

- A. Provide and install aluminum clad wood windows as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

1.4 QUALITY ASSURANCE

- A. The Owner will select a pre-qualified independent testing laboratory. Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Marvin

2.2 FRAME

- A. Interior: Non finger-jointed Vertical Grain Douglas Fir with non finger-jointed Vertical Grain Douglas Fir veneer.
 - 1. Kiln-dried to moisture content no greater than twelve (12) percent at the time of fabrication
 - 2. Water repellant preservative treated in accordance with WDMA I.S.4.
- B. Frame exterior aluminum clad with 0.050 inch (1.3mm) thick extruded aluminum
- C. Frame thickness: 1 3/16" (30mm)
- D. Frame depths for full frame units have an overall 5 21/32" jamb (144mm). 4 9/16" (116mm) jamb depth from the nailing fin plane to the interior face of the frame for new construction

2.3 WINDOW TYPES

- A. Marvin Signature Ultimate Casement Stationary

2.4 SASH

- A. Non finger-jointed Vertical Grain Douglas Fir with non finger-jointed Vertical Grain Douglas Fir veneer.
 - 1. Kiln-dried to moisture content no greater than twelve (12) percent at the time of fabrication
 - 2. Water repellant preservative treated with accordance with WDMA I.S.4
 - 3. Sash exterior aluminum clad with 0.050" (1.3mm) thick extruded aluminum

4. Sash thickness: 1 5/8" (41mm) and 1 7/8" (48mm) for full frame units.
 5. Stiles and Rails: 2 1/16" (52mm)
 6. Tall bottom rail (except on transoms/upper units): 3 9/16" (90mm)
 7. Interior Sash Sticking: Ogee
- 2.5 JAMB EXTENSIONS
- A. Jamb extensions for wall thicknesses as field verified by Contractor. These shall be factory applied.
- 2.6 EXTERIOR TRIM
- A. Factory applied brick mould casing (1-1/4" x 2") and subsill (15/16 x 2-15/16")
- 2.7 GLAZING
- A. All glass is of a select quality complying with Federal Specification DD-G-451D, ASTM, C 1036-85. Provide Insulated Glazing Unit as indicated on Drawings
- 2.8 GLAZING SEAL
- A. Silicone bedding glazed at interior and exterior
- 2.9 WEATHERSTRIPPING
- A. All units are weatherstripped. Frame is weatherstripped on all four sides with flexible gaskets. Sash is sealed around perimeter with leaf-type weatherstrip.
- 2.10 TRIM
- A. Provide indicated trim, matching material and finish of frame members.
- 2.11 SIMULATED DIVIDED LITES
- A. 7/8" (22mm) wide, with internal spacer bar
 - B. Exterior muntins: 0.055" (1.4mm) thick extruded aluminum
 - C. Interior muntins: Vertical Grain Douglas Fir
 - D. Muntins adhere to glass with closed-cell copolymer acrylic foam tape
 - E. Sticking: Ogee
 - F. Pattern: As indicated on Drawings
 - G. Finish – exterior matches exterior aluminum clad colors, interior matches' interior wood species and color
- 2.12 EXTERIOR FINISH
- A. Aluminum cladding, Fluoropolymer modified acrylic topcoat applied over primer. Color as indicated on Drawings
- 2.13 INTERIOR FINISH
- A. Factory-applied water-borne urethane stain. Stain applied over a wood (stain) conditioner. A water-borne acrylic enamel clear coat applied in two separate coats, with light sanding between coats, applied over the stain. Meets WDMA TM-14 requirements.

EXECUTION

3.2 FABRICATION

- A. Fabricate all products in this Section in complete accordance with the standards referenced in the published literature of the selected manufacturer.

3.3 INSTALLATION

A. Surface conditions

1. Prior to installation of the work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
2. Verify that wood windows may be installed in complete accordance with the original design and the manufacturer's recommendations.
3. In the event of discrepancy, immediately notify the Architect.
4. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

B. Installation

1. Install all wood windows in strict accordance with the original design, all pertinent codes and regulations, and the manufacturer's recommendations, installing the locks specified in Section 08700 of these Specifications, and anchoring all components firmly into position for long life under hard use. Provide Owner with additional touch up paint.
2. Set units level, plumb, and true to line, without warp or rack of frames and panels. Provide proper support and anchor securely in place.
3. Set sill members in bed of sealant or with gaskets, as indicated, to provide weathertight construction.
4. Adjust operating panels, screens, and hardware to provide a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.
5. Clean glass and aluminum surfaces immediately after installing windows. Remove nonpermanent labels from glass surfaces.

END OF SECTION 08 52 13

GENERAL

1.1 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Sliding Doors.
 - 3. Other doors to the extent indicated.
- B. "Hardware groups" have been assigned to the various doors required for this work. Provide and install all finish hardware described in the Hardware Schedule and all other finish hardware not described but required for a complete and operable facility.
- C. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Electromechanical door hardware, power supplies, back-ups and surge protection.
 - 3. Automatic operators.
 - 4. Cylinders specified for doors in other sections.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these Specifications.
- B. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- C. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
- D. Shop Drawings: Details of electrified access control hardware indicating the following:
 - 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. Elevation diagram of each unique access-controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.
 - 2. Electrical Coordination: Coordinate with related Division 26 Electrical Sections the voltages and wiring details required at electrically controlled and operated hardware openings.

- E. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

1.4 QUALITY ASSURANCE

- A. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure difference.
 - 3. ICC/IBC - International Building Code.
 - 4. NFPA 70 - National Electrical Code.
 - 5. NFPA 80 - Fire Doors and Windows.
 - 6. NFPA 101 - Life Safety Code.
 - 7. NFPA 105 - Installation of Smoke Door Assemblies.
 - 8. UL/ULC and CSA C22.2 – Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
 - 9. TAS-201-94 - Impact Test Procedures.
 - 10. TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
 - 11. TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
 - 12. California Building Code.
- B. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series.
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies.
- C. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
 - 1. Test Pressure: Positive pressure labeling.
- D. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.

1.5 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.6 WARRANTY

- A. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- B. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- C. Special Warranty Periods
 - 1. Ten years for mortise locks and latches.
 - 2. Ten years for extra heavy duty cylindrical (bored) locks and latches.
 - 3. Seven years for heavy duty cylindrical (bored) locks and latches.
 - 4. Five years for standard duty cylindrical (bored) locks and latches.
 - 5. Five years for exit hardware.
 - 6. Twenty-five years for manual surface door closers.
 - 7. Ten years for heavy duty floor closers.
 - 8. Two years for shallow depth floor closers.
 - 9. Two years for overhead concealed closers.
 - 10. Two years for electromechanical door hardware.

1.7 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
 - 1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
 - 2. Products furnished, but not installed, under this Section include the following. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.
 - a. **Permanent cylinders, cores and keys to be installed by Owner.**
- B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required.
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:

- a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 - (1) Out-swinging exterior doors.
 - (2) Out-swinging access-controlled doors.
 - (3) Out-swinging lockable doors.
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 certified continuous geared hinge with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Provide concealed flush mount (with or without inset), full surface, or half surface, in standard and heavy-duty models, as specified in the Hardware Sets. Concealed continuous hinges to be U.L. listed for use on up to and including 90-minute rated door installations and U.L. listed for windstorm components where applicable. Factory cut hinges for door size and provide with removable service power transfer panel where indicated at electrified openings.
- C. Floor Closers: ANSI/BHMA A156.4 certified floor closers provided either center hung or 3/4" offset hung type complete with top and intermediate pivots (offset closers only) in quantity according to manufacturer's recommendation. Floor closers available with options for labeled, lead lined and regular doors. Provide independent and adjustable valves for closing speed, latch speed, and backcheck with built-in dead stop and hold open features as specified. Provide finish cover plates or thresholds as indicated in door Hardware Sets.
- D. Pivots: ANSI/BHMA A156.4, Grade 1, certified pivots provided either center hung or 3/4" offset type complete with top, bottom, and intermediate pivots (offset pivots only) in quantity according to manufacturer's recommendations. Space intermediate pivots equally not less than 25 inches on center apart or not more than 35 inches on center for doors over 121 inches high. Pivot hinges to have oil impregnated bronze bearing in the top pivot and a radial roller and thrust bearing in the bottom pivot with the bottom pivot designed to carry the full weight of the door. Pivots to be UL listed for windstorm where applicable.
- E. Sliding Door Hardware: Sliding door hardware is to be of type and design as specified and should comply with ANSI/BHMA A156.14. Provide complete sets consisting of track, hangers, stops, bumpers, floor channel, guides, and accessories indicated.

2.3 POWER TRANSFER DEVICES

- A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
- B. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
- C. Provide mortar guard enclosure on steel frames installed at masonry openings for each electrical hinge specified.

2.4 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified automatic, self-latching, and manual flush bolts and surface bolts. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor. Furnish dust proof strikes for bottom bolts. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
- B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Coordinators fabricated from steel with nylon-coated strike plates and built-in adjustable safety release.
- C. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 - 1. Push/Pull Plates: Minimum .050-inch-thick, size as indicated in hardware sets, with square corners and beveled edges, secured with exposed screws unless otherwise indicated.
 - 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 - 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 - 4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

2.5 CYLINDERS AND KEYING

- A. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
 - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 - 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - 5. Keyway: Manufacturer's Standard. Match Facility Standard. Match Facility Restricted Keyway.
- B. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
 - 1. Interchangeable Cores: Core insert, removable by use of a special key; usable with other manufacturers' cylinders.
- C. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner. Incorporate decisions made in keying conference, and as follows:
 - 1. Master Key System: Cylinders are operated by a change key and a master key.
 - 2. Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.

3. Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.
4. Existing System: Master key or grand master key locks to Owner's existing system.
5. Keyed Alike: Key all cylinders to same change key.
- D. Key Quantity: Provide the following minimum number of keys:
 1. Top Master Key: One (1).
 2. Change Keys per Cylinder: Two (2).
 3. Master Keys (per Master Key Group): Two (2).
 4. Grand Master Keys (per Grand Master Key Group): Two (2).
 5. Construction Keys (where required): Ten (10).
 6. Construction Control Keys (where required): Two (2).
 7. Permanent Control Keys (where required): Two (2).
- E. Construction Keying: Provide construction master keyed cylinders or temporary keyed construction cores where specified. Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores. Furnish permanent cores for installation as directed under specified "Keying Conference".

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified mortise locksets furnished in the functions as specified in the Hardware Sets. Locksets to be manufactured with a corrosion resistant, stamped 12-gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body. Lockset trim (including knobs, levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.
 1. Mortise locks to be certified Security Grade 1 and include vandal resistant heavy gauge escutcheon or sectional type trim.
- B. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified cylindrical (bored) locksets furnished in the functions as specified in the Hardware Sets. Lock chassis fabricated of heavy gauge steel, zinc dichromate plated, with through-bolted application. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt. Locks are to be non-handed and fully field reversible.

2.7 ELECTROMECHANICAL LOCKING DEVICES

- A. Electromechanical Mortise Locksets, Grade 1 (Heavy Duty): Subject to same compliance standards and requirements as mechanical mortise locksets, electrified locksets to be of type and design as specified below.
 1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including outside door lock/unlock trim control, latchbolt and lock/unlock status monitoring, and request-to-exit signaling. Unless otherwise indicated, provide electrified locksets standard as fail secure.

2.8 AUXILIARY LOCKS

- A. Cylindrical Deadlocks: ANSI/BHMA A156.5, Grade 1, cylindrical type deadlocks to fit standard ANSI 161 preparation and 1 3/8" to 1 3/4" thickness doors. Provide tapered collars to resist vandalism and 1" throw solid steel bolt with hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other locksets.

2.9 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows.
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 - 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
- B. Standards: Comply with the following:
 - 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 - 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 - 3. Strikes for Auxiliary Deadlocks: BHMA A156.5.
 - 4. Dustproof Strikes: BHMA A156.16.

2.10 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
 - 1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 - 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 - a. Fire Exit Removable Mullions: Provide keyed removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions to be used only with exit devices for which they have been tested.
 - 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 - 4. Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
 - 5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy-duty trim with cold forged escutcheons, beveled edges, and four threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets. Provided free-wheeling type trim where indicated.
 - b. Where function of exit device requires a cylinder, provide an interchangeable core type keyed cylinder (Rim or Mortise) as specified in Hardware Sets.

6. Vertical Rod Exit Devices: Provide and install interior surface and concealed vertical rod exit devices as Less Bottom Rod (LBR) unless otherwise indicated.
7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
9. Rail Sizing: Provide exit device rails factory sized for proper door width application.
10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets.
- C. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish. Provide keyed removable feature, stabilizers, and mounting brackets as specified in the Hardware Sets. At openings designed for severe wind load conditions due to hurricanes or tornadoes, provide manufacturers approved mullion and accessories to meet applicable state and local windstorm codes.

2.11 ELECTROMECHANICAL CONVENTIONAL EXIT DEVICES

- A. Electrified Conventional Push Rail Devices (Heavy Duty): Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified herein.
- B. Electrified Options: As indicated in hardware sets, provide electrified exit device options including: electric latch retraction (must be motorized type that fully retracts the touchpad/push bar), electric dogging, outside door trim control, exit alarm, delayed egress, latchbolt monitoring, lock/unlock status monitoring, touchbar monitoring and request-to-exit signaling. Unless otherwise indicated, provide electrified exit devices standard as fail secure.

2.12 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Cycle Testing: Provide closers which have surpassed 10 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - a. Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.

- b. Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.
 - c. Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.
 - d. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics. Provide drop plates or other accessories as required for proper mounting.
- 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.
- B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one-piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

2.13 AUTOMATIC DOOR OPERATORS

- A. General: Provide operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.
 - 1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.
- B. Electromechanical Door Operators: Self-contained units powered by permanent magnet DC motor, with closing speed controlled mechanically by gear train, connections for power, activation and safety device wiring, and manual operation including spring closing when power is off.
- C. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.
- D. Standard: Certified ANSI/BHMA A156.19.
 - 1. Performance Requirements
 - a. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
 - b. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.
- E. Configuration: Surface mounted. Door operators to control single swinging and pair of swinging doors.
- F. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19. When not in automatic mode, door operator to function as manual door closer with fully adjustable opening and closing forces, with or without electrical power.
 - 1. On-off switch to control power to be key switch operated.

- G. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.
- H. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.
- I. Activation Devices: Provide activation devices in accordance with ANSI/BHMA A156.19 standard, for condition of exposure indicated and for long term, maintenance free operation under normal traffic load operation. Coordinate activation control with electrified hardware and access control interfaces. Activation switches are standard SPST, with optional DPDT availability.
- J. Signage: As required by cited ANSI/BHMA A156.19 standard for the type of operator.

2.14 SURFACE MOUNTED CLOSER HOLDERS

- A. Electromagnetic Door Holders: Certified ANSI A156.15 electromagnetic door holder/releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate 12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button.

2.15 ARCHITECTURAL TRIM

- A. Door Protective Trim
 - 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 - 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 - a. Metal Protection Plates: ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), beveled on four edges (B4E), fabricated from the following.
 - b. Stainless Steel: .050-inch thick, with countersunk screw holes (CSK).
 - c. Brass or Bronze: .050-inch thick, with countersunk screw holes (CSK).
 - d. Laminate Plastic or Acrylic: 1/8-inch thick, with countersunk screw holes (CSK).
 - 3. Fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets.
 - 4. Metal Door Edging: Door protection edging fabricated from a minimum .050-inch thick metal sheet, formed into an angle or "U" cap shapes, surface or mortised mounted onto edge of door. Provide appropriate leg overlap to account for protection plates as required. Height to be as specified in the Hardware Sets.

2.16 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

2.17 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

2.18 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.19 FINISHES

- A. Standard designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.20 ACCEPTABLE MANUFACTURERS AND PRODUCTS

Astragal	Manufacturer/Product:	Pemko 355_PK
	Finish:	Dark Bronze Anodized Aluminum
Closer, Surface	Manufacturer/Product:	LCN 4000 Series
	Options:	Adj. Delayed Action Closing
	Cover:	Architectural metal
	Finish:	Dark Bronze
Closer, Surface, HO	Manufacturer/Product:	LCN 4000 Series
	Options:	Adj. Delayed Action Closing; Hold Open
	Cover:	Architectural metal
	Finish:	Dark Bronze

Cylinder	Manufacturer/Product:	by Lockset Manufacturer
	Options:	Interchangeable core
Cylinder, Dogging	Manufacturer/Product:	Mortise, by Lockset Manufacturer
	Options:	Interchangeable core
Door Bolt (Deadlock)	Manufacturer/Series:	Schlage, B-series
	Grade:	1
	Finish:	BHMA 613
Door Shoe	Manufacturer/Product:	Pemko 210_PK
	Finish:	Dark Bronze Anodized Aluminum
Electrical Power Transfer	Manufacturer/Product:	Von Duprin EPT
Exit Device, Interior	Manufacturer/Series:	Von Duprin 98-series
	Type:	Rim
	Dogging:	Cylinder
	Trim/Function:	996L
	Lever Style:	Rhodes
	Finish:	BHMA 643e
Exit Device, Interior Entry	Manufacturer/Series:	Von Duprin 98-series
	Type:	Rim
	Dogging:	Cylinder
	Trim/Function:	990NL
	Finish:	BHMA 643e
Exit Device, Exterior Entry	Manufacturer/Series:	Von Duprin 98-series
	Type:	Mortise
	Dogging:	Cylinder
	Trim/Function:	990NL
	Finish:	BHMA 643e
Exit Device, Exterior Secondary	Manufacturer/Series:	Von Duprin 98-series
	Type:	Mortise
	Trim/Function:	996L
	Lever Style:	Rhodes
	Finish:	BHMA 643e
Flush Bolt, Metal Door	Manufacturer/Product:	Ives Manual Flush Bolt FB457, pair (top and bottom) with dust-proof strike
	Finish:	US10B
Flush Bolt, Wood Door	Manufacturer/Product:	Ives Manual Flush Bolt FB358 top bolt
	Finish:	US10B
Hinges, Exterior Doors	Manufacturer/Product:	Ives Five Knuckle BB Full Mortise NRP
	Material:	Brass
	Grade:	1
	Height:	4.5
	Finish:	US10B
Hinges, Interior Doors	Manufacturer/Product:	Ives Five Knuckle BB Full Mortise
	Material:	Steel
	Grade:	2
	Height:	4.5
	Finish:	US10B
Kickplate	Manufacturer/Product:	Ives 8400-series 10" high
	Finish:	US10B
Lever/ Dummy Trim	Manufacturer/Product:	Schlage ND170
	Lever Style:	Rhodes
	Finish:	BHMA 613
Low Energy Door Operator	Manufacturer/Product:	refer to Specification Section 08 71 13

Locksets, Cylindrical	Manufacturer/Series:	Schlage ND-series
	Grade:	1
	Lever Style:	Rhodes
	Finish:	BHMA 613
	Function:	per Hardware Group
Locksets, Mortise	Manufacturer/Series:	Schlage L-series
	Grade:	1
	Lever Style:	06
	Escutcheon:	Full Face
	Thumbturn:	ADA turn only where scheduled
	Options:	Wired Electrified Lockset where scheduled
Mop Plate	Manufacturer/Product:	Ives 8400-series 6" high
	Finish:	US10B
Pull	Manufacturer/Product:	Ives 8305, 4"x 16" w/ 10" pull
	Finish:	US10B
Push Plate	Manufacturer/Product:	Ives 8200, 4"x 16"
	Finish:	US10B
Smokestripping	Manufacturer/Product:	Pemko S88
	Finish:	Dark Brown
Stop/ Holder, Overhead, Exterior	Manufacturer/Product:	Glynn-Johnson 90 Series
	Finish:	US10B
Stop/ Holder, Overhead, Interior	Manufacturer/Product:	Glynn-Johnson 410 Series
	Finish:	US10B
Stop, Floor	Manufacturer/Product:	Ives FS444
	Finish:	US10B
Stop, Wall	Manufacturer/Product:	Ives WS401
	Finish:	US10B
Threshold	Manufacturer/Product:	Pemko 272
	Finish:	Dark Bronze Anodized
Threshold, Thermally Broken	Manufacturer/Product:	Pemko 253x4_FG
	Finish:	Dark Bronze Anodized
Weatherstripping	Manufacturer/Product:	Pemko 29310_PK
	Finish:	Dark Bronze Anodized

EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115.series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames".
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors".
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities".
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Power Operator products and accessories are required to be installed through current members of the manufacturer's "Power Operator Preferred Installer" program.
- D. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants".
- F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SCHEDULE

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. Hardware Groups

Group:	001
Doors:	100.1
Scheduled Hardware:	

Cylinder
Dogging Cylinder
Door Shoe
Exit Device Exterior Entry
Hinges Exterior Doors
Kickplate
Low Energy Door Operator
Threshold Thermally Broken
Weatherstripping

Group:	002a
Doors:	101.3
Scheduled Hardware:	

Closer Surface, HO
Cylinder
Door Shoe
Exit Device Exterior Secondary
Hinges Exterior Doors
Kickplate
Stop Floor
Threshold Thermally Broken
Weatherstripping

Group:	002b
Doors:	115.2
Scheduled Hardware:	
Closer	Surface
Cylinder	
Door Shoe	
Exit Device	Exterior Secondary
Hinges	Exterior Doors
Kickplate	
Stop	Floor
Threshold	Thermally Broken
Weatherstripping	

Group:	003
Doors:	107.2
Scheduled Hardware:	
Cylinder	
Door Shoe	
Elect Power Transfer	
Hinges	Exterior Doors
Kickplate	
Lockset, Mortise	Elect. Function: L9493EU
Stop/Holder	Overhead, Exterior
Threshold	Thermally Broken
Weatherstripping	

Group:	004
Doors:	114.1
Scheduled Hardware:	
Astragal	
Cylinder	
Door Shoe	
Flush Bolt	Metal Door
Hinges	Exterior Doors
Kickplate	
Lockset, Mortise	Function: Storeroom
Stop/Holder	Overhead, Exterior
Threshold	
Weatherstripping	

Group:	005
Doors:	117.1
Scheduled Hardware:	
Cylinder	
Door Shoe	
Elect Power Transfer	
Hinges	Exterior Doors
Kickplate	
Lockset, Mortise	Elect. Function: L9493EU
Stop/Holder	Overhead, Exterior

Threshold
Weatherstripping

Thermally Broken

Group:	006
Doors:	ED1
Scheduled Hardware:	
Closer	Surface, HO
Cylinder	
Dogging Cylinder	
Exit Device	Interior Entry
Hinges	Existing
Kickplate	

Group:	007
Doors:	100.2, 115.1
Scheduled Hardware:	
Closer	Surface
Cylinder	
Exit Device	Interior
Hinges	Existing
Kickplate	
Stop	Wall

Group:	008
Doors:	101.4
Scheduled Hardware:	
Closer	Surface
Cylinder	
Door Bolt	Single Cylinder w/ thumbturn
Hinges	Interior Door
Kickplate	
Pull	
Push	
Stop	Floor

Group:	009
Doors:	102.1
Scheduled Hardware:	
Cylinder	
Flush Bolt	Wood Door
Hinges	Interior Door
Lockset, Cylindrical	Function: Storeroom

Group:	010
Doors:	103.1, 107.1
Scheduled Hardware:	
Cylinder	
Hinges	Interior Door
Lockset, Cylindrical	Function: Classroom Security
Stop/Holder	Overhead, Interior

Group:	011
Doors:	104.1, 105.1
Scheduled Hardware:	
Closer	Surface
Hinges	Interior Door
Kickplate	
Mop plate	
Pull	
Push	
Stop	Wall

Group:	012
Doors:	106.1
Scheduled Hardware:	
Cylinder	
Hinges	Interior Door
Lockset, Cylinder	Function: Storeroom
Mop plate	

Group:	013
Doors:	109.1, 110.1
Scheduled Hardware:	
refer to Specification Section 08 34 00	

Group:	014
Doors:	111.1
Scheduled Hardware:	
Cylinder	
Hinges	Interior Door
Lockset, Cylinder	Function: Classroom
Stop	Wall

Group:	015
Doors:	113.1 (20-minute fire rated)
Scheduled Hardware:	
Closer	Surface
Cylinder	
Hinges	Interior Door
Kickplate	
Lockset, Cylinder	Function: Classroom
Stop	Overhead

Group:	G1
Doors:	G1 (trash enclosure gate)
Scheduled Hardware:	
Cylinder	
Door Bolt	One-way deadbolt
all other hardware by gate fabricator	

Group:	G3
Doors:	G3 (storage enclosure door)

Scheduled Hardware:

Cylinder	
Door Bolt	Single Cylinder w/ thumbturn
Hinges	Exterior
Lever/ Dummy Trim	

END OF SECTION 08 71 00

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide and install low-energy power door operators in compliance with the California Building Code where indicated on the Drawings and as specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.
 - 1. Product Data: Submit manufacturer's complete product and installation data.
 - 2. Shop Drawings: Submit drawings showing layout, profiles, product components including anchorage, accessories, finish and glazing details (where required).
 - 3. Closeout Submittals: Submit the following:
 - a. Owner's Manual.
 - b. Warranty document as specified herein.
 - c. AAADM inspection compliance form completed and signed by certified AAADM inspector prior to doors being placed in operation as proof of compliance with ANSI A156.19.

1.4 REFERENCES

- A. AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA) 101: Appendix Dissimilar Materials.
- B. AMERICAN ASSOCIATION OF AUTOMATIC DOOR MANUFACTURERS (AAADM).
- C. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):
 - 1. ANSI A156.19: For Power Assist and Low Energy Power Operated Doors
 - 2. ANSI.117.1: Accessible and Usable Buildings and Facilities
- D. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) B221: Aluminum-Alloy Extruded Bars, Rods, Shapes and Tubes.
- E. AMERICANS WITH DISABILITIES ACT (ADA) 1990
- F. CALIFORNIA BUILDING CODE (CBC)
- G. BUILDING OFFICIALS AND CODE ADMINISTRATORS INTERNATIONAL (BOCA)
- H. INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS / UNIFORM BUILDING CODE (ICBO/UBC)
- I. INTERNATIONAL CODE COUNCIL / INTERNATIONAL BUILDING CODE (ICC/IBC)
- J. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 101:
 - 1. NFPA 101: Code for Safety to Life from Fire in Buildings & Structures.
 - 2. NFPA 70: National Electrical Code (NEC).

- K. THE ALUMINUM ASSOCIATION (AA) Aluminum Finishes Manual.
 - L. UNDERWRITERS LABORATORY, INC. (USA & CANADA) UL 325: Electrical Door, Drapery, Gate, Louver, and Window Operators and Systems.
- 1.5 QUALITY ASSURANCE
- A. Installer's Qualifications: Installer shall be factory trained, certified by AAADM, and experienced to perform work of this section.
 - B. Manufacturer's Qualifications: Manufacturer to have minimum (5) five years successful experience in the fabrication of automatic doors of the type required for this project. Manufacturer capable of providing field service representation during installation, approving acceptable installer and approving application method.
 - C. Certifications: Automatic sliding door systems and options shall be factory certified to meet performance design criteria in accordance with the following standards:
 - 1. ADA 1990: Americans With Disabilities Act
 - 2. ANSI A156.19: For Power Assist and Low Energy Power Operated Doors
 - 3. ANSI.117.1: Accessible and Usable Buildings and Facilities
 - 4. NFPA 101: Code for Safety to Life from Fire in Buildings & Structures.
 - 5. UL 325: Electrical Door, Drapery, Gate, Louver, and Window Operators and Systems.
 - 6. BOCA: Means of Egress, Power Operated Doors
 - 7. ICBO/UBC: Egress Through Lobbies
 - 8. ICC/IBC: Egress Section
 - D. Source Limitations: Obtain automatic door operators through one source from a single manufacturer.
 - E. Power Operated Door Standard: ANSI/BHMA A156.19.
 - F. Operation: Automatic and Manual
 - 1. Automatic: Push Plate switch actuates door open; door closes after time delay expires. Opening and closing force, measured 1" (25.4 mm) out from the lock stile of the door, not to exceed 15 pounds (67 N) of force to stop the door when operating in either direction. Operator to include the following variable adjustments so as to comply with ANSI Standard A156.19: Opening speed – 4 1/2 to 6 seconds; Closing speed – 4 1/2 to 6 seconds.
 - G. 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.
 - H. Operating Range: -30° F to 130° F (-34° C to 54° C)
 - I. Opening Force Requirements for Egress Doors: In the event power failure to the operator, swinging automatic entrance doors shall open with a manual force, not to exceed 30 lbf (133 N) applied at 1" (25 mm) from the latch edge of the door.
 - J. Door Energy: The kinetic energy of a door in motion shall not exceed 1.25 lbf-ft (1.69 Nm).
 - K. Closing Time:
 - 1. Doors shall be field adjusted to close from 90 degrees to 12 degrees in 5 seconds or longer.
 - 2. Doors shall be field adjusted to close from 12 degrees to fully closed in not less than 1.5 seconds.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Horton Automatics, a division of Overhead Door Corporation, shall manufacture automatic swing door(s) of type(s) and size(s) specified on plans and door schedule.

2.2 SYSTEM

- A. Basis of Design: EASYACCESS ® Series 7100: Surface Applied Operator with connecting arms and linkage shall provide positive control of door through entire swing; units shall permit use of butt hung and center pivot doors.
 - 1. Mounting: The operator header shall be surface mounted, and the operator housing must span the full width of the opening.
 - 2. Door Arms: Connecting hardware shall be a double arm arrangement that can either push the door or pull the door open to suit the job condition. When the operator mounting is on the pull side and adjacent wall is within 4" (102 mm) of the door frame, specify a parallel arm.
 - 3. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.
 - 4. Header Case: Shall be a side access extruded aluminum case. Standard header size shall be 4" x 6" (102 mm x 152 mm) with optional 6" x 6" (152 mm x 152 mm).
 - 5. All wiring for the door operator and activating devices (actuators) shall be concealed in the walls system or framing. Exposed wire mold or conduit is not acceptable.
- B. Operator: The Electric Operating Mechanism shall be Series 7000: Operator shall be mounted and concealed in an extruded aluminum case for smooth and quiet operation. Maximum current draw shall not exceed 3.15 amps.
 - 1. Opening Action: Shall be accomplished by a 1/15 HP D.C. permanent magnet motor working through reduction gears to the output shaft.
 - 2. Field Adjustable Spring Closing Action: shall be accomplished by a field replaceable spring. When the door is in the closing mode or fully closed, motor voltage shall not be required and will be off. The door can be manually operated with power on or off without damage to the operator.
 - 3. Independent Adjustable Closing and Latching Speed Control: The operator shall employ a rheostat module to allow for independent field adjustment of closing and latching speeds using the motor as a dynamic brake.
 - 4. Field Adjustable Open Stop: The operator shall provide a field adjustable open stop to accommodate opening angles from 80 to 135 degrees without the need for additional components.
 - 5. Consistent Cycle: The operator shall deliver an even, consistent open force across the entire transition from door fully closed to door open check. Additionally, the range of the force shall be field adjustable to accommodate a wide range of on-site conditions.
 - 6. Manual Use: The operator shall function as a manual door closer in the direction of swing with or without electrical power. The operator shall deliver an even, consistent open force across the entire transition from door fully closed to door fully open.
 - 7. Controller Protection: The controller shall incorporate the following features to ensure trouble free operation:
 - a. Automatic Reset upon power up.

- b. Main fuse protection.
 - c. Electronic surge protection.
 - d. Internal power supply protection.
 - e. Resettable sensor supply fuse protection.
- 8. Push Button Interface: The controller shall have push button switches with to allow for selection or change of the following parameters: carpet or timer logic, single or dual door, activation options, normal back check or large back check, push-to-open assist on/off.
- 9. Soft Start/Stop: A "soft-start" "soft-stop" motor driving circuit shall be provided for smooth normal opening and recycling.
- 10. Control Switch: Automatic door operators shall be equipped with a three position function switch to control the operation of the door. Control switch shall provide three modes of operation, Automatic, Off, and Hold-Open.
- 11. Master Control: Shall incorporate the following features:
 - a. Adjustable time delay of 2 to 30 seconds (ANSI A156.19 requirement is 5 second minimum time delay).
 - b. Infinite adjustment to opening and open check speeds including adjusting the opening force without affecting the opening speed.
 - c. Immediate reversal of door motion without undue strain on the drive train. This will be accomplished by supplying stepped voltage to the motor. The door shall reverse when closing if an object stops the door.
 - d. Motor Protection Circuit: A locked door motor protection circuit will be supplied that will shut off current to the motor when the door is inadvertently locked or otherwise prevented from opening.

2.3 RELATED EQUIPMENT

- A. Activating Device shall be located on each side of the opening as per ANSI Safety Standard A117 and shall be hardwired to door operator controls.
 - 1. Vertical bar actuators: Wikk Ingress'r S-I36-3
 - a. Clear Anodized (628) Aluminum Type 6063 T-5
 - b. Graphics: International Symbol for Accessibility and "Push To Open"; color: blue
- B. Refer to Door Hardware Specification 08 71 00 for Barrier Free Restroom Control Kit for door operator control/activating system at interior restroom. Coordinate door operator options with control kit requirements.

2.4 RELATED WORK REQUIREMENTS

- A. Electrical: To be provided under Division 16: 120 or 220 VAC, 60 cycle, 1 phase, 10 amps for doors with operators in pairs, 5 amps for single doors. Non-North American voltages can be 240 VAC (operator must have 240 volt power supply)

2.5 MATERIALS, FINISHES AND FABRICATION

- A. Extruded Aluminum: ASTM B221, 6063-T5 alloy and temper, anodized: Structural Header Sections: Minimum 1/8" (3 mm) thickness.
- B. Finishes (for all exposed aluminum surfaces) shall be 204-R1 Clear: Arch. Class 2 Clear Anodized Coating, AA-MI2C22A31.
- C. Operator Construction: Electromechanical.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Installer must verify that base conditions previously installed under other sections are acceptable for product installation according to with manufacturer's instructions. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of work. Do not start work until all negative conditions are corrected in a manner acceptable to the installer and manufacturer.

3.2 INSTALLATION

- A. General: Installer shall be factory trained, certified by AAADM, and experienced to perform work of this section. Install door units plumb, level and true to line, without warp or rack of frames or sash with manufacturer's prescribed tolerances. Provide support and anchor in place.
- B. Dissimilar Materials: Comply with AAMA 101, Appendix Dissimilar Materials by separating aluminum materials and other corrodible surfaces from sources of corrosion or electrolytic action contact points.
- C. Weather-tight Construction: Install header and framing members in a bed of sealant or with joint filler or gaskets. Coordinate installation with wall flashings and other components of construction.
- D. Electrical: General or electrical contractor to install all wiring to operator on a separate circuit breaker routed into header.

3.3 OPERATION

- A. All door operators installed at openings with card access (access control) shall be interfaced with the access system so that when door is unlocked (i.e. card reader is 'green'), outside actuator opens the automated leaf. When door is locked (i.e. card reader is 'red'), outside actuator is deactivated. Inside actuator must always temporarily unlock and open the door.

3.4 CLEANING, ADJUSTMENT AND PROTECTION

- A. Cleaning: After installation, installer to take following steps:
 - 1. Remove temporary coverings and protection of adjacent work areas.
 - 2. Remove construction debris from construction site and legally dispose of debris.
 - 3. Repair or replace damaged installed products.
 - 4. Clean product surfaces and lubricate operating equipment for optimum condition and safety.
- B. Adjustment: AAADM certified technician shall inspect and adjust installation to assure compliance with ANSI A156.19.
- C. Advise Contractor of precautions required through the remainder of the construction period, to ensure that doors will be without damage or deterioration (other than normal weathering) at the time of acceptance.
- D. Field Quality Control: Testing Services: Factory Trained Installer shall test and inspect each swinging automatic entrance door to determine compliance of installed systems with applicable ANSI standards.

END OF SECTION 08 71 13

GENERAL

1.1 SUMMARY

- A. Provide and install insulating glass units (IGU) and monolithic float glass as indicated on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.
- B. Product Data: For each glass product and glazing material indicated.
- C. Verification Samples: For the following products, in the form of 12 inch (305 mm) square samples for insulating glass units.
- D. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- E. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
 - 1. For solar-control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.
- F. Qualification Data: For installers.
- G. Product Test Reports: For each of the following types of glazing products.
 - 1. Tinted float glass.
 - 2. Coated float glass.
 - 3. Insulating glass.
- H. Warranties: Special warranties specified in this Section.

1.4 REFERENCES

- A. ANSI Z97.1 - American National Standard for Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- B. ASCE 7 - "Minimum Design Loads for Buildings and Other Structures".
- C. ASTM International (ASTM):
 - 1. ASTM C 162 - Standard Terminology of Glass and Glass Products.
 - 2. ASTM C 1036 - Standard Specification for Flat Glass.
 - 3. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass -- Kind HS, Kind FT Coated and Uncoated Glass.
 - 4. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass.
 - 5. ASTM C 1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass.

6. ASTM E 2188 - Standard Test Method for Insulating Glass Unit Performance.
7. ASTM E 2189 - Standard Test Method for Testing Resistance to Fogging in Insulating Glass Units.
8. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.

1.5 PERFORMANCE REQUIREMENTS

- A. General: Provide glass capable of withstanding thermal movement and wind and impact loads (where applicable) as specified in paragraph B following.
- B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
 1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Design Wind Loads: Determine design wind loads applicable to the Project according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings.
 - (1) Refer to Structural Drawings
- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from ambient and surface temperatures changes acting on glass framing members and glazing components.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
 1. For monolithic-glass lites, properties are based on units with lites 1/4 inch (6.0 mm) thick.
 2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 3. Center-of-Glass Values: Based on using LBL-44789 WINDOW 5.0 computer program for the following methodologies:
 - a. U-Factors: NFRC 100 expressed as Btu/ sq. ft. per h per degree F.
 - b. Solar Heat Gain Coefficient: NFRC 200.
 - c. Solar Optical Properties: NFRC 300.

1.6 QUALITY ASSURANCE

- A. Sustainable Design Certification: Glass shall be Cradle to Cradle Certified, minimum Level, Cradle to Cradle Innovation Institute.
- B. Fabricator Qualifications: as acceptable to the manufacturer.
- C. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs

glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level-2 (Senior Glaziers) or Level-3 (Master Glaziers).

- D. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type: Clear float glass, coated float glass and insulating glass.
- E. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- F. Glazing Publications: Comply with published recommendations of glass product manufacturers and industry organizations, including but not limited to those below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
 - 2. GANA Publications: "Laminated Glazing Reference Manual"; "Glazing Manual."
 - 3. AAMA: "Sloped Glazing Guidelines."
 - 4. IGMA: "Guidelines for Sloped Glazing."
- G. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following testing and inspecting agency:
 - 1. Insulating Glass Certification Council.
 - 2. Associated Laboratories, Inc.
 - 3. Insulating Glass Manufacturers Alliance.
- H. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, Insulating Glass Manufacturers Alliance ANSI Z97.1.
 - 1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
 - 2. Lites more than 9 sq ft (0.84 sq m) in area are required to be Category II materials.
 - 3. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sf (0.84 sq m) in area, provide glazing products that comply with Category II materials, and for lites 9 sf (0.84 sq m) or less in area, provide glazing products that comply with Category I or II materials.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 WARRANTY

- A. Manufacturer's Warranty on Insulating Glass: Manufacturer's standard form in which the insulating glass unit manufacturer agrees to replace insulating-glass units that deteriorate during normal use within the specified warranty period. Deterioration of insulating glass

units is defined as an obstruction of vision by dust, moisture, or a film on the interior surfaces of the glass caused by a failure of the hermetic seal that is not attributed to glass breakage, improper installation, or cleaning and maintenance that is contrary to the manufacturer's written instructions.

1. Warranty Period: 10 years from date of Substantial Completion.

PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Vitro Architectural Glass; Glass Technology Center, 400 Guys Run Rd., Pittsburgh, PA 15024. ASD. Toll Free Tel: (800) 887-6457. Fax: (800) 367-2986. Web: <http://www.vitroglazings.com>.

2.2 GLASS PRODUCTS

- A. Annealed Float Glass: ASTM C 1036, Type I (transparent flat glass), Quality-Q3; of class indicated.
- B. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; of class, kind, and condition indicated.
 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
 2. Provide Kind HS (heat-strengthened) float glass in place of annealed float glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
 3. For uncoated glass, comply with requirements for Condition A.
 4. For coated vision glass, comply with requirements for Condition C (other uncoated glass).
 5. Provide Kind FT (fully tempered) float glass in place of annealed or Kind HS (heat-strengthened) float glass where safety glass is indicated or required.
- C. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in Part 2 "Insulating-Glass Units" Article.
 1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
 2. Provide Kind FT (fully tempered) glass lites where safety glass is indicated or required.
 3. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulating-glass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
 4. Sealing System: Comply with requirements in Section 07 90 00 - Joint Sealants. Dual seal, with primary and secondary sealants of polyisobutylene and silicone.
 5. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:

- a. Spacer Material: Aluminum with mill or clear anodic finish.
- b. Desiccant: Molecular sieve or silica gel, or blend of both.
- c. Corner Construction: Manufacturer's standard corner construction.

2.3 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

2.4 GLASS/ GLAZING SCHEDULE

- A. Refer to the Glazing Schedule on the Drawings.

EXECUTION

3.1 GLAZING

- A. Set all glass in a true plane, tight and straight, with proper and adequate clearance, firmly anchored to prevent rattling and looseness, with all edges cleanly cut; do not nip or seam the edges.
- B. Perform glazing in compliance with manufacturer's published requirements and recommendations and industry publications listed in Part 1.6 above.

3.2 CLEANING UP

- 1. Upon completion of glazing, thoroughly clean all glass surfaces, correct all imperfections, replace all damaged glass, and leave all labels on the glass until they have been inspected and approved by the Architect and/or Building Official but remove all labels immediately thereafter.

END OF SECTION 08 80 00

GENERAL

1.1 SUMMARY

- A. Provide and Install gypsum board where shown on the Drawings and as specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 32 33 of these specifications.
- B. Mock-up: With location approval of the Architect, develop a sample room demonstrating the final specified finish appearance, subjected to the same lighting conditions when occupied, of walls, ceilings and soffits to receive finish.

1.4 FIRE-RESISTANCERATED ASSEMBLIES

- A. Provide materials and construction identical to those tested in assemblies per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

1.5 STC-RATED ASSEMBLIES

- A. Provide materials and construction identical to those tested in assemblies per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing and inspecting agency.

1.6 INDOOR AIR POLLUTION CONTROL

- A. VOC content in Gypsum Board Adhesives shall be limited to 50 grams per liter (less water and less exempt compounds).

PRODUCTS

2.1 PANEL PRODUCTS

- A. Provide in maximum lengths available to minimize end-to-end butt joints.
- B. Interior Gypsum Board: ASTM C 1396/C 1396M, in thickness indicated, with manufacturer's standard edges. Regular type unless otherwise indicated; Type X where indicated.
- C. Moisture-Resistant Gypsum Backing Board: (For use behind all tile in "wet" areas including all toilet room walls, janitor room walls, kitchen, etc.) ASTM C 1396/C 1396M, in thickness indicated. [Regular type unless otherwise indicated] [Type X where required for fire-resistance-rated assemblies and where indicated]
 - 1. Product: CertainTeed Pro Roc Moisture Resistant Gypsum Board, or equal.

2.2 ACCESSORIES

- A. Metal Trim Accessories: ASTM C 1047, formed from galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet. For exterior trim, use accessories formed from hot-dip galvanized-steel sheet, plastic, or rolled zinc.
 - 1. Provide cornerbead at outside corners unless otherwise indicated.

2. Provide LC-bead (J-bead) at exposed panel edges.
3. Provide control joints where indicated.
- B. Joint-Treatment Materials: ASTM C 475/C 475M.
 1. Joint Tape: Paper unless otherwise recommended by panel manufacturer.
 2. Joint Compounds: Setting-type taping compound and drying-type, ready-mixed, compounds for topping.
 3. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.
- C. Fasteners: Screws complying with ASTM C954 or C1002.
- D. Adhesives: Liquid Nails Construction Adhesive by Macco Adhesives or equal, type as required for the material applied to.
- E. Other Materials: All other materials, not specifically described but required for a complete and proper installation of gypsum drywall, shall be as selected by the Contractor subject to approval of the Architect.

EXECUTION

3.1 INSTALLATION

- A. Install gypsum board panels in accordance with GA-216 and ASTM C840.
- B. Install all panels plumb, level, and with all vertical joints on bearing. Panels/patches smaller than 144 square inches may not be used without prior approval of Architect.
- C. Cutting
 1. When cutting gypsum drywall is required, cut by scoring and breaking or by sawing, working from the face side.
 2. When cutting by scoring, cut through the face paper and then snap the panel back away from the cut face; then break the back paper by snapping the gypsum board in the reverse direction or by cutting the back paper.
 3. Smooth all cut ends and edges of panels as necessary to obtain a smooth joint.
 4. For cut-outs in panels for pipes, fixtures, and other small openings, make holes and cut-outs by sawing or by such other method as will not fracture the core or tear the covering and with such accuracy that plates, escutcheons, or trim will cover the edges.
 5. The use of "score-and-knockout" method will not be permitted.
- D. Fastening
 1. Properly space all fasteners in careful accordance with the manufacturer's recommendations and code requirements, with heads driven slightly below the surface for proper cementing but without breaking the paper cover.
 2. Loosely butt all joints to be taped; firmly butt all joints to be left untreated.
 3. Stagger all end joints and the joints between panels to achieve a maximum of bridging and a minimum of continued joints.
- E. Ceiling
 1. At those areas where gypsum drywall ceiling is indicated on the Drawings, and where it is possible to do so, install the ceiling prior to installing walls.

2. Where possible, and where permitted by code, float the interior ceiling angles.

3.2 CONTROL JOINTS

- A. Where not shown on the Drawings, provide control joints at wall and ceiling areas which exceed maximum areas or lengths.
- B. Install control joints at ceiling areas.
 1. Which exceed 2,500 square feet.
 2. Where continuous panel surface exceeds 50 feet in either direction.
 3. Where ceiling furring changes direction.
- C. Install control joints in wall and wall furring panels which exceed 30 feet in length.
- D. Verify placement of control joints with Architect prior to installation.

3.3 INSTALLING METAL TRIM

- A. The drawings do not purport to show all metal trim required; verify with the Architect the precise locations and types of trim to be used.
- B. Carefully inspect the Drawings and verify location of all metal trim required. Install all trim in strict accordance with the manufacturers' recommendations, paying particular attention to make all trim installation plumb, level, and true to line, with firm attachment to supporting members.

3.4 TAPING AND FINISHING LEVEL 5 FINISH

- A. Control heating and ventilating during finishing operations to ensure the maintenance of 55° F. minimum temperature.
- B. Provide surface finish to the level shown on the Drawings, and as described below:
 1. First coat - Level 2 Finish
 - a. Spread compound evenly over all joints, using suitable tools designed for that purpose.
 - b. Fill all joint recesses and metal trim.
 - c. Center the reinforcing tape on the joint and press into the fresh compound, wiping down with sufficient pressure to remove excess compound but leaving sufficient compound under the tape for proper bond.
 - d. Feather all edges and leave the surface free from blisters and tape wrinkles.
 - e. Apply compound to all fastener heads, leaving flush with the adjacent surfaces.
 - f. Fold reinforcing tape along its centerline and apply to all interior angles, following the same procedure as for joints.
 2. Second coat – Level 3 Finish
 - a. Lightly sand the dry compound with fine sandpaper to remove all irregularities.
 - b. Apply a second coat of compound to all joints, feathering approximately three inches beyond edges of tape.
 - c. Apply a second coat of compound to all fastener heads.
 3. Third coat – Level 4 Finish
 - a. Lightly sand the dry compound with fine sandpaper to remove all irregularities.

- b. Apply final skim coat, feathering out approximately two inches beyond second coat.
 - c. Third coat all fastener heads and metal trim and all interior angles; allow to dry.
- 4. Fourth coat – Level 5 Finish: (Smooth Finish)
 - a. Lightly sand the dry compound with fine 220 grit sandpaper to remove all irregularities.
 - b. Apply final skim coat over entire wall, ceiling or soffit surfaces. Do not roll or spray apply. Wipe down immediately leaving a uniform tight smooth surface of joint compound.

3.5 CLEANING UP

- A. Do not allow the accumulation of scraps and debris arising from the work of this Section but maintain the premises in a neat and orderly condition at all times; in the event of spilling or splashing compound onto other surfaces, immediately remove the spilled or splashed material and all trace of the residue to the approval of the Architect.

END OF SECTION 09 29 00

GENERAL

1.1 SUMMARY

- A. Provide ceramic tile where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

PRODUCTS

2.1 CERAMIC TILE

- A. Provide ceramic tile and accessories complying with Tile Council of America Specification 137.1, in colors and patterns as noted on the drawings from standard colors and patterns of the approved manufacturers.
- B. Floor Tile
 - 1. Provide coefficient of friction not less than 0.50 when tested in accordance with ASTM F489, ASTM F609, and the National Bureau of Standards Technical Note 895.
- C. Provide standard accessory shapes as required including wall inside and outside corners, wainscot top surface cove, and base cove.

2.2 LIQUID APPLIED CRACK ISOLATION MEMBRANE FOR FLOORS

- A. Under all floor tile installations install anti-fracture membrane, ANSI 118.12: Laticrete Blue 92 or Custom-Building Products Red Gard.

2.3 TILE ACCESSORIES

- A. Schluter System tile accessories (edge trim, transition trim, control joints). Refer to Drawings for details and model numbers.

2.4 SETTING MATERIALS

- A. Comply with pertinent recommendations contained in the Tile Council of America "Handbook for Ceramic Tile Installation".
- B. Latex – Portland cement complying with ANSI A118.4 by Laticrete or equal.
- C. Special tile setting mortars will be considered by the Architect when complete technical data is submitted in advance.

2.5 GROUT

- A. Comply with pertinent recommendations contained in the Tile Council of America "Handbook for Ceramic Tile Installation" in colors selected by the Architect from standard colors available from the approved manufacturers.

1. Provide a commercially prepared single-component premium grout with high flexibility and stain resistance: Fusion Pro Single Component Grout/Custom Building Products 800-272-8786 or equal.
- B. Grout Color
 1. As selected by Architect from manufacturer's standards.
- 2.6 CAULK
 - A. Provide caulk in color to match grout. Custom Building Products Commercial Silicone Caulk or Ceramic Tile Caulk, or equal.
- 2.7 OTHER MATERIALS
 - A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

EXECUTION

3.1 EXAMINATION

- A. Verify that wall surfaces are free of substances which would impair bonding of setting materials, smooth and flat within tolerances specified in ANSI A137.1 and are ready to receive tile.
- B. Verify that sub-floor surfaces are dust-free, and free of substances which would impair bonding of setting materials to sub-floor surfaces and are smooth and flat within tolerances specified in ANSI A137.1.
- C. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Protect surrounding work from damage.
- B. Remove any curing compounds or other contaminants.
- C. Vacuum clean surfaces and damp clean.
- D. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.3 INSTALLATION

- A. General
 1. Comply with ANSI A108.1, ANSI A108.2, and the latest published edition of "Handbook for Ceramic Tile Installation" of the Tile Council of America, except as otherwise directed by the Architect or specified herein:
 - a. Interior concrete floor, thin set with crack-isolation membrane, F113.
 - b. Interior frame wall, gypsum board, W243.

- B. Lay tile to pattern indicated. Arrange pattern so that a full tile or joint is centered on each wall and that no tiles less than ½ width is used. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Install non-ceramic trim in accordance with manufacturer's instructions.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep expansion joints free of adhesive or grout. Apply tile caulking to joints.
- J. Allow tile to set for a minimum of 48 hours prior to grouting.
- K. Grout tile joints. Use standard grout unless otherwise indicated.
- L. Apply tile caulking to junction of tile and dissimilar materials and junction of dissimilar planes.

3.4 INSTALLATION – FLOORS – THIN SET METHODS

- A. Over interior concrete substrates, install in accordance with TCA Handbook Method F113, dry-set or latex-Portland cement bond coat compatible with crack-isolation membrane, with standard grout, unless otherwise indicated.

3.5 INSTALALTION – WALL TILES

- A. Over gypsum wallboard on wood or metal studs install in accordance with TCA Handbook Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.

3.6 CLEANING

- A. Clean tile and grout surfaces.

3.7 PROTECTION OF FINISHED WORK

- A. Do not permit traffic over finished floor surface for 72 hours after installation.
- B. Cover floors with Kraft paper and protect from dirt and residue from other trades.
- C. Where floor will be exposed for prolonged periods cover with plywood or other similar type walkways.

END OF SECTION 09 30 00

GENERAL

1.1 SUMMARY

- A. Provide and install suspended acoustical ceilings as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.

1.4 STANDARDS

- A. Suspended acoustical ceiling systems shall be installed in accordance with the provisions of ASTM C635 and ASTM C636 as modified by ASCE 7 Section 13.5.6.2.2 for Seismic Design Categories D, E, and F.

1.5 ADDITIONAL STOCK

- A. Provide (3) cartons of new, unopened ceiling tiles of each type to the Owner.

PRODUCTS

2.1 SUSPENDED GRID SYSTEM

A. Manufacturers

- 1. All suspended grid systems shall be in the pattern indicated on the Drawings and shall be one of the following or an equal approved in advance by the Architect. All grids shall be factory finished white, 15/16" face width. Main beam shall be Heavy Duty Class rated.
 - a. USG / Donn Products, Inc.
 - b. Armstrong Corporation.
 - c. Certainteed EZ Stab Classic

B. Perimeter support

- 1. Provide nominal 1" (min. 7/8") perimeter support closure angle with seismic clip attaching runners to perimeter angle. Seismic clip shall be the product of the grid manufacturer and shall be installed in accordance with the applicable ICC-ES report:
 - a. USG / Donn ASM7 Clip; ICC-ES ESR 1222.
 - b. Armstrong BERC-2 Clip; ICC-ES ESR 1308.
 - c. Certainteed: ICC-ES ESR 3336.

C. General

- 1. The system shall be complete with all support members, anchors, wall cornices, and adapters for light fixtures and ceiling grilles, plus all accessories of every nature required for a complete installation.

2.2 ACOUSTICAL CEILING BOARDS

- A. Manufacturers: All acoustical ceiling boards shall be as specified on the Finish Schedule or an equal approved in advance by the Architect
- B. All ceiling boards shall be the product of one manufacturer, nominally sized lay-in panels and shall be fire rated where indicated on the Drawings.

2.3 OTHER MATERIALS

- A. All other materials not specifically described but required for a complete and proper installation of suspended acoustical ceiling shall be as selected by the Contractor subject to the approval of the Architect.

EXECUTION

3.1 INSTALLATION OF "T" GRID

- A. General
 - 1. Erect metal "T" members in the pattern shown on the Drawings, spacing members symmetrically about the centerline of areas in both directions and/or as shown on the Drawings.
 - 2. Space hanger wires a maximum of four feet on centers along main runners.
 - 3. Accurately level all main runners; space main runners a maximum of four feet on centers.
 - 4. Space cross "T" members as shown on the Drawings and secure to main runners and wall angles in accordance with the approved Shop Drawings.
 - 5. Securely anchor all wall angle members in place.
 - 6. Provide and install suspension wires for electrical fixtures.
- B. Make all grid level within a tolerance of one in 500 and straight within a tolerance of one in 1000.

3.2 LATERAL AND COMPRESSION BRACING

- A. Furnish and install lateral bracing consisting of at least twelve gage wire, splayed at 45 degrees, in the following locations.
 - 1. At the midpoint of all unsupported partitions exceeding twelve linear feet.
 - 2. At twelve feet on center each way in all large ceiling areas not restrained by partitions.
- B. Secure all lateral bracing to structural members; secure at right angles to the direction of the partition and four way in large ceiling areas.
- C. Furnish and install vertical compression bracing as required by the U.B.C., latest edition Use the system as detailed on the drawings or factory-built components to comply with the code requirements.

3.3 SEISMIC SEPARATION

- A. For ceiling areas exceeding 2500 square feet, a seismic separation joint shall be installed to break the ceiling up into areas not exceeding 2500 square feet. Install seismic separation joint where indicated on the Drawings or as directed by the Architect.

3.4 INSTALLATION OF ACOUSTICAL CEILING BOARDS

- A. Install all acoustical ceiling boards in the exposed "T" grid system so that linearity of facing is in one direction only, and to the approval of the Architect.

3.5 FIELD CUTTING

- A. All field cutting as required for tegular type lay-in ceiling tiles shall be required at the wall angles and linear HVAC diffusers, and shall be performed in a craftsman-like manner equal to the factory edge cut. Touch up the cut edge with white paint as provided by the manufacturer to match the tile facing.

3.6 CLEANING UP

- A. Completely remove all fingerprints and traces of soil from the surfaces of grid and acoustical ceiling boards, using only those cleaning materials specifically recommended for the purpose by the manufacturers of the materials cleaned.

END OF SECTION 09 51 13

GENERAL

1.1 SUMMARY

- A. Provide and install wood veneer acoustical ceiling planks as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 32 33 of these specifications.
- B. Product Data: Submit manufacturer's technical data for each type of wall or ceiling panel required.
- C. Samples: Where finishes involve normal color and texture variations, include sample sets showing the range of variations expected. One 12" x 12" samples of each panel type, pattern, and color.
- D. Certifications: Certified test reports showing compliance with performance requirements specified.
- E. Shop Drawings: Submit shop drawings showing how panels are to be laid out on the walls and ceilings, details of trim members and width of panels. Width of panels and location of seams are critical.
- F. Single Source: All custom acoustical wall and ceiling panels shall be purchased from a single supplier.

1.4 QUALITY ASSURANCE

- A. Manufacturer & Installer: Firm manufacturing the specified product shall have adequate capacity required for projects listed and have successfully completed similar projects for a period of not less than two years. The manufacturer shall have the right to approve the selection of the fabricator and to verify that said fabricator has sufficient experience and expertise to complete the project in a satisfactory manner.
- B. Reference Standards: Conform to all governing laws, building codes, and the following performance criteria
 - 1. Fire Performance Characteristics: Provide panels with fire ratings in accordance with ASTM E84 test procedures. ASTM E-84 testing must be performed by an independent testing organization acceptable to authorities having jurisdiction.
 - 2. Acoustical Performance Characteristics: Provide wall and ceiling panels with acoustical absorption characteristics as indicated in Part 2, which have been determined by testing fully assembled production material in accordance with ASTM C-423 (Type E400 for ceiling and F6 for wall mounting method as defined by ASTM E-795) by a testing organization acceptable to authorities having jurisdiction. Approved testing organization must be independent of the manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver panels to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Panels should not be stored in spaces where the temperature or humidity conditions vary greatly from the temperatures and conditions that will be normal in the occupied space. The temperature should be between 50 degrees F and 86 degrees F and relative humidity should not fall below 35 percent or exceed 55 percent.
- C. Before installing panels, permit them to reach room temperature and a stabilized moisture content.
- D. Handle wall panels carefully to avoid chipping edges or damaged units in any way.

1.6 PROJECT CONDITIONS

- A. Space Enclosure:
 - 1. Panels should be permitted to reach room temperature and have a stabilized moisture content for a minimum of 72 hours before installation.
 - 2. Panels should not be stored or installed in spaces where the temperature or humidity conditions vary greatly from the temperatures and conditions that will be normal in the occupied space.
 - 3. As interior finish products, the panels are designed for installation in temperature conditions between 50 degrees F and 86 degrees F, in spaces where the building is enclosed and HVAC systems are functioning and will be in continuous operation. Relative humidity should not fall below 35 percent or exceed 55 percent.

1.7 WARRANTY

- A. Submit to Owner or Owner's Representative a written and dated warranty issued by the acoustic panel manufacturer warranting the panels against defects in materials or manufacturing for a period of 10 years from the date of delivery. Warranty is limited to materials installed in their original location.
- B. Components used in the system but not provided by the manufacturer are excluded from the manufacturer's warranty. Damage caused by exposure to moisture or rapid or extreme changes to temperature or humidity are excluded from the manufacturer's warranty. Damage caused by improper storage, handling, acclimatization, or installation is excluded from the warranty. Appearances and colorings of wood products, stains and finishes can vary over time and as site conditions change and are therefore excluded from the warranty.

1.8 MAINTENANCE

- A. Extra Materials
 - 1. Deliver no less than *5 percent* of each type, color and pattern of material.
 - 2. Extra materials shall be from the same production run as the original materials.
 - 3. Extra materials shall remain in the manufacturer's original unopened packaging and given to the building owner upon substantial completion of the work.

PRODUCTS

2.1 MANUFACTURER

- A. Navy Island Inc. 275 Marie Ave. E., St. Paul, Mn 55118 PH 651-451-4454 Email, Sales@navyisland.com.

- B. Contact Navy Island for a list of qualified fabricators to fabricate panels into finished walls/ceilings/fixtures

2.2 CEILING SYSTEM

- A. Soundply Lino Acoustic Ceiling Planks, LR Series
 - 1. Microperforated surface
 - 2. Plank widths per Drawings
 - 3. Wood veneer per Drawings
 - 4. Class A fire rating
 - 5. Finish: Clear or Tinted Uni-Matte Flat Varnish, as selected by Architect
 - 6. Provide manufacturer's clips and fasteners for installation indicated on the Drawings

EXECUTION

3.1 EXAMINATION

- A. Inspect installation area and conditions under which work is to be performed for compliance with all manufacturers' environmental requirements. All wet work in the installation area must be complete, cured and dry prior to installation. Work above shall be complete, inspected and accepted before ceiling installation work begins. Do not proceed until all unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Ceilings
 - 1. Comply with manufacturer's instruction and recommendations and industry standards for installation of ceiling planks.
 - 2. Coordinate the exact size, location and sequencing of penetrations of ceiling planks by all building components.
 - 3. Lay out ceiling pattern per approved shop drawings.
 - 4. Where ceilings of different heights abut, install acoustical material matching ceiling at vertical surface of ceiling break.

3.3 ADJUSTING AND CLEANING

- A. Clean soiled surfaces of ceiling and wall panels per manufacturer's instructions.
- B. Remove and replace damaged or discolored material and material that cannot be properly cleaned.
- C. Adjust panels after installation so that surfaces are aligned, flush and level with gaps between units consistent in width and straight.

END OF SECTION 09 54 26

GENERAL

1.1 SUMMARY

- A. Provide and install resilient tile flooring and accessories where indicated on the Drawings and as specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.
- B. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions for flooring and accessories.
- C. Submit the manufacturer's standard samples showing the required colors for flooring and applicable accessories.
- D. If required, submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

1.4 QUALITY ASSURANCE AND REGULATORY REQUIREMENTS

- A. Select an installer who is competent in the installation of solid vinyl flooring with acrylic adhesive or two part epoxy.
- B. If required, provide resilient flooring and accessories supplied by one manufacturer, including leveling and patching compounds, and adhesives.
- C. If required, provide flooring material to meet the following fire test performance criteria as tested by a recognized independent testing laboratory:
 - 1. ASTM E 648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I.
 - 2. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less.

1.5 ENVIRONMENTAL CONDITIONS

- A. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.
- B. Store materials in a clean, dry, enclosed space off the ground, and protected from the weather and from extremes of heat and cold. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.
- C. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65°F (18°C) and a maximum temperature of 85°F (29°C) for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55°F (13°C) and a maximum temperature of 85°F (29°C) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating appliances.

- D. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

1.6 INDOOR AIR POLLUTANT CONTROL REQUIREMENTS

- A. All Resilient Tile Flooring shall be certified under the Resilient Floor Covering Institute's FloorScore Program or shall comply with the VOC emission limits defined in 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its Low-emitting Materials List.
- B. VOC content in Resilient Tile Flooring Adhesives shall be limited to 50 grams per liter (less water and less exempt compounds).

1.7 WARRANTY

- A. Manufacturer's standard 20 year limited commercial warranty and 20 year finish coat warranty commencing on the Date of Substantial Completion.

PRODUCTS

2.1 RESILIENT FLOORING MATERIALS

- A. Refer to Drawings for Manufacturer, Product, and Color
- B. Specifications
 - 1. Construction - Luxury Vinyl Tile & Plank, Non-orthophthalate
 - 2. Overall Thickness – 5mm
 - 3. Wearlayer Thickness – 20 mil (1.0 mm)
 - 4. Finish Layer – ExoGuard
 - 5. Edge Profile: Squared Edge
 - 6. Specification (ASTM F-1700) - Class III, B
- C. Testing
 - 1. HUD/FHA - Passes
 - 2. Flexibility (ASTM F137) - Passes - 1" Mandrel - No Crack/Break
 - 3. Dimensional Stability (ASTM F2199) - Passes - Max 0.020 in/lin ft
 - 4. Squareness (ASTM F540) - Passes - Max 0.010"
 - 5. Static Load (ASTM F970 mod.) - Passes – 1200 PSI
 - 6. Residual Indentation (ASTM F1914) - Passes - < 8% Avg / 10% Single Value
 - 7. Flooring Radiant Panel (ASTM E648) - Passes - Class 1; ≥ 0.45 watts/cm²
 - 8. Smoke Density (ASTM E662) - Passes - ≤ 450
 - 9. Coefficient of Friction (ASTM D2047, Slip Resistance) - ≥ 0.5
 - 10. Resistance to Light (ASTM F1515) - Passes
 - 11. Chemical Resistance (ASTM F925) - Passes
 - 12. Resistance to Heat (ASTM F1514) - Passes

D. Environmental

1. Indoor Air Quality - FloorScore Certified; CDPH v1.1-2010
2. Product Declarations – EPD, HPD

2.2 ADHESIVES

- A. VOC-compliant, high moisture enhanced adhesive as recommended by flooring manufacturer.

2.3 ACCESSORIES

- A. For patching, smoothing, and leveling monolithic subfloors (concrete, terrazzo, quarry tile, ceramic tile, and certain metals), provide Portland Cement-Based Underlayment.
- B. For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.
- C. LVT must have the ability to be chemically welded to adjoining broadloom carpet materials.
- D. Provide transition/reducing strips tapered to meet abutting materials.
- E. Provide threshold of thickness and width as shown on the drawings.
- F. Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Architect from standard colors available.
- G. Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

EXECUTION

3.1 INSPECTION

- A. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.
- B. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.
- C. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.
- D. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.2 PREPARATION

- A. Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with Portland Cement-Based Underlayment as recommended by the flooring manufacturer.

- B. Remove paint, varnish, oils, release agents, sealers, and waxes. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds. Avoid organic solvents.
- C. Perform subfloor Relative Humidity and/or Calcium Chloride Tests, pH Tests, and Bond Tests as described in manufacturer's installation guide to determine if surfaces are dry, free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. Maximum levels to be determined based on adhesive choice and manufacturer's published installation instructions.
- D. Vacuum or broom-clean surfaces to be covered immediately before the application of flooring. Make subfloor free from dust, dirt, grease, and all foreign materials.

3.3 INSTALLATION OF FLOORING

- A. Install flooring in strict accordance with manufacturer's installation guide and any other product specific published installation instructions.
- B. Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.
- C. If required, install flooring on pan-type floor access covers. Maintain continuity of color and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.
- D. Scribe, cut, and fit to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.
- E. Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's instructions. Observe the recommended adhesive trowel notching, open times, and working times.

3.4 INSTALLATION OF ACCESSORIES

- A. Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.
- B. Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.
- C. Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Perform initial maintenance according to the latest edition of the manufacturer's maintenance and warranty literature. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings.
- B. Do not wax, polish, seal or apply other finishes to the installed flooring unless specifically directed by end user.

END OF SECTION 09 65 19

GENERAL

1.1 SUMMARY

- A. Provide and install tile carpeting required for this work as shown on the Finish Schedule of the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

1.4 INDOOR AIR POLLUTANT CONTROL REQUIREMENTS

- A. All Carpet shall meet the testing and product requirements of one of the following:
 - 1. Carpet and Rug Institute's Green Label Plus Program.
 - 2. California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350).
 - 3. NSF/ANSI 140 at the Gold Level.
 - 4. Scientific Certification Systems Sustainable Choice.
- B. All Carpet cushion installed in the building interior shall meet the requirements of the carpet and Rug Institute Green Label Program.
- C. Per Section 5.504.4.1 of the 2013 California Green Building Standards Code, all carpet adhesives 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 of the 2013 California Green Building Standards Code. 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)

1.5 ADDITIONAL STOCK

- A. Deliver to Owner carpet tiles equal to 5 percent of each type and color carpet tile installed, packaged with protective covering for storage.

PRODUCTS

2.1 CARPET TILE

- A. Products
 - 1. Refer to the Drawings

EXECUTION

3.1 INSTALLATION

- A. Comply with CRI 104.
- B. Installation Method: As recommended by manufacturer
- C. Place units in strict compliance with the manufacturer's recommendations as approved by the Architect.
 - 1. Butt units tightly to vertical surfaces, nosings, edgings and thresholds.
 - 2. Scribe as necessary around obstructions and to produce neat joints.
 - 3. Place tiles tightly laid, even, and in straight parallel lines.
 - 4. Extend tiles into toe spaces, door reveals, and in closets and other similar adjoining spaces.
- D. Lay units from center marks established with principal walls, discounting minor offsets, so that units at opposite sides of the room are of equal width.
 - 1. Adjust as necessary to avoid use of cut widths less than 3" wide at room perimeters.
 - 2. Lay units square to the axis of the room or space unless otherwise shown on the Drawings
- E. Match units for color and pattern by using materials from cartons in the same sequence as manufactured and packaged.
- F. Lay in pattern shown on the Drawings.
- G. Place edge strips tightly butted to units and secured with adhesive; provide at all unprotected edges unless otherwise shown on Drawings.

END OF SECTION 09 68 13

GENERAL

1.1 SUMMARY

- A. Provide and install fiberglass reinforced panels (FRP) where shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.
- B. Accompanying the product data, submit 8" x 10" or larger samples of the full range of colors and patterns available in the plastic-coated wall panels, plus 12" or longer samples of colors and patterns available in the moldings.

PRODUCTS

2.1 FIBERGLASS REINFORCED PANELS

- A. Provide fiberglass reinforced panels, Marlite Artizan FRP with Sani-coat. Panolam RFP, or equal.
 - 1. Color as selected from manufacturer's standard or as specified on the Drawings.
 - 2. Texture: Pebble Smooth.
 - 3. Fire Rating: Class A.
 - 4. Size: 4'x8', 4'x9', 4'x10' or as required for design applications.

2.2 MOLDINGS

- A. Extruded PVC trim; color to match panels.
- B. Outside Corner Guard: PVC color to match panel.

2.3 ACCESSORIES

- A. Fasteners: Non-staining nylon drive rivets to match panel color.
- B. Adhesive: By manufacturer.
- C. Sealant: Color matching by manufacturer.

2.4 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

EXECUTION

3.1 PREPARATION

- A. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.
 - 1. Verify that stud spacing does not exceed 24 inch on-center.
- B. Repair defects prior to installation.
 - 1. Level wall surfaces to panel manufacturer's requirements. Remove protrusions and fill indentations.

3.2 INSTALLATION

- A. Comply with manufacturer's recommended procedures and installation sequence.
- B. Cut sheets to meet supports allowing 1/8" (3mm) clearance for every 8 foot (2.43m) of panel.
 - 1. Cut and drill with carbide tipped saw blades or drill bits or cut with shears.
 - 2. Pre-drill fastener holes 1/8" (3.175 mm) oversize with high speed drill bit.
 - a. Space at 8" (20.32 cm) maximum on-center at perimeter, approximately 1" from panel edge.
 - b. Space at in field in rows 16 inches (40.64 cm) on-center, with fasteners spaced at 12" (30.48 cm) maximum on-center.
- C. Apply panels to board substrate, above base vertically oriented with seams plumb and pattern aligned with adjoining panels.
 - 1. Install panels with manufacturer's recommended gap for panel field and corner joints.
 - a. Adhesive trowel and application method to conform to adhesive manufacturer's recommendations.
 - b. Drive fasteners for snug fit. Do not over-tighten.
- D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
 - 1. All moldings must provide for a minimum 1/8" (3.18 cm) of panel expansion at joints and edges, to insure proper installation.
 - 2. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

3.3 CLEANING

- A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.
- B. Refer to manufacturer's specific cleaning recommendations. Do not use abrasive cleaners.

END OF SECTION 09 77 20

GENERAL

1.1 SUMMARY

- A. Provide painting as shown on the Finish Schedule in the Drawings and specified herein. The type of material to be used and the number of coats to be applied are listed in the "Painting Schedule" under Execution in this Section of these Specifications. The term "paint", as used herein, included enamels, epoxies, paints, sealers, fillers, emulsions, and other coatings, whether used as prime, intermediate, or finish coats.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

1.4 INDOOR AIR POLLUTANT CONTROL REQUIREMENTS

- A. VOC Limits
 - 1. 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 of the 2016 California Green Building Standards Code, unless more stringent local limits apply.
 - 2. 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.
- B. Aerosol Paints and Coatings
 - 1. 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.

1.5 MOCK-UPS

- A. Mockups: Full-coat finish Sample of each type of coating, color, and substrate, applied where directed.

1.6 PROJECT CONDITIONS

- A. The General Contractor is responsible to ensure all materials used in this Section meet current California V.O.C. (volatile organic compounds/chemicals) Regulations. The Architect shall be immediately notified of all V.O.C. conflicts. Work shall not proceed until conflicts are resolved.

1.7 EXTRA STOCK

- A. Upon completion of this portion of the Work, deliver to the Owner an extra stock of one gallon of each color and gloss used in each coating material used, with all such extra stock tightly sealed in clearly labeled containers.

PRODUCTS

2.1 PAINT MATERIALS

- A. Manufacturer
 - 1. All paint materials selected for coating systems for each type of surface shall be the product of a single manufacturer.
 - 2. Paint materials listed herein, unless otherwise designated in the "Painting Schedule", are the product of Benjamin Moore and require no further approval as to manufacturer or catalog number.
 - 3. Equivalent products of other major paint manufacturers may be used subject to approval by the Architect of the materials list and manufacturers' recommendations required to be submitted under Article 1.3 above. Equivalent product manufacturers must provide a manufacturers product reference guide demonstrating the equivalence of the product substituted to the one specified.
- B. Compatibility
 - 1. All paint materials and equipment shall be compatible in use; finish coats shall be compatible with prime coats; prime coats shall be compatible with the surface to be coated; all tools and equipment shall be compatible with the coating to be applied.
 - 2. Thinners, when used, shall be only those thinners recommended for that purpose by the manufacturer of the material to be thinned.
- C. Colors and glosses
 - 1. All colors and glosses shall be indicated on the Painting Schedule and Finishes Schedule.

EXECUTION

3.1 PREPARATION OF SURFACES, GENERAL

- A. Prior to all surface preparation and painting operations, completely mask, remove or otherwise adequately protect all hardware, accessories, machined surfaces, plates, lighting fixtures, and similar items in contact with painted surfaces but not scheduled to receive paint.
- B. Spot prime all exposed nails and other metals which are to be painted with emulsion paints, using a primer recommended by the manufacturer of the coating system.
- C. Before applying paint or other surface treatment, thoroughly clean all surfaces involved. Schedule all cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

3.2 PREPARATION OF WOOD SURFACES

- A. Clean all wood surfaces until they are free from dirt, and all other foreign substance.
- B. Unless specifically noted to be left rough, smooth all finished wood surfaces exposed to view, using the proper sandpaper. Where so required, use varying degrees of coarseness in sandpaper to produce uniformly smooth and unmarred wood surfaces.

C. Knots

1. On small, dry, seasoned knots, thoroughly scrape and clean the surface and apply one coat of good quality knot-sealer before application of the priming coat.
2. On large, open, unseasoned knots, scrape off all pitch and thoroughly clean the area, followed by an application of one coat of good quality knot-sealer.
3. Remove and treat all pitch surfaces as required for large knots.

D. Dryness

1. Unless specifically approved by the Architect, do not proceed with the painting of wood surfaces until the moisture content of the wood is 12% or less as measured by a moisture-meter approved by the Architect.

3.3 PREPARATION OF METAL SURFACES

A. Galvanized metal

1. Clean all surfaces thoroughly with solvent until they are completely free from dirt, soil, and grease.
2. Thoroughly treat the cleaned surface with phosphoric acid etch.
3. Remove all excess etching solution and allow to dry completely before application of paint.

B. Other metals

1. Thoroughly clean all surfaces until they are completely free from dirt, oil, grease and old paint.
2. Allow to dry thoroughly before application of paint.

3.4 PAINT APPLICATION

A. General

1. Paint all surfaces, except glass, flat concrete, and similar items, not prefinished and not called out as unfinished.
2. Paint all grilles and other prefinished items where the factory prefinish is not in accordance with the Painting Schedule and color selection or where a prefinished item is not the same color as the adjacent surface. Paint to match adjacent surface.

B. Drying

1. Allow sufficient drying time between coats.
2. Modify the period as recommended by the material manufacturer to suit adverse weather conditions.

C. Environmental conditions

1. Comply with the manufacturer's recommendations as to environmental conditions under which the coating systems may be applied.
2. Do not apply paint in areas where dust is being generated.

D. Defects

1. Sand and dust between coats to remove all defects visible to the unaided eye from a distance of five feet.

E. Color of undercoats

1. Slightly vary the color of succeeding coats.

3.5 INSPECTION

- A. Do not apply additional coats until completed coat has been inspected and approved by the Architect.
- B. Only inspected and approved coats of paint will be considered in determining the number of coats applied.

3.6 RE-INSTALLATION OF REMOVED ITEMS

- A. Following completion of painting in each space, promptly reinstall all items removed for painting, using only workmen skilled in the particular trade.

3.7 CLEANING UP

- A. During progress of the Work, do not allow the accumulation of empty containers or other excess items except in areas specifically set aside for that purpose. Prevent accidental spilling of paint materials and, in event of such spill, immediately remove all spilled material and the waste or other equipment used to clean up the spill, and wash the surfaces to their original undamaged condition, all at no additional cost to the Owner.
- B. Upon completion of this portion of the Work visually inspect all surfaces and remove all paint and traces of paint from surfaces not scheduled to be painted.

3.8 PAINTING SCHEDULE

Apply the following finishes to the areas designated:

Exterior Wood, Satin

First Coat:	Benjamin Moore	166 SuperSpec Busan Primer
Second Coat:	Benjamin Moore	634 Aura Exterior Low Lustre
Third Coat:	Benjamin Moore	634 Aura Exterior Low Lustre

Exterior Metal (Galvanized), Semi-Gloss

First Coat:	Benjamin Moore	P04 Acrylic Metal Primer
Second Coat:	Benjamin Moore	632 Aura Exterior Semi-Gloss
Third Coat:	Benjamin Moore	632 Aura Exterior Semi-Gloss

Interior Metal (Ferrous), Semi-Gloss

First Coat:	Benjamin Moore	P04 Acrylic Metal Primer Or P06 Alkyd Metal Primer
Second Coat:	Benjamin Moore	528 Aura Interior Semi-Gloss
Third Coat:	Benjamin Moore	528 Aura Interior Semi-Gloss

Interior Drywall, Satin

First Coat:	Benjamin Moore	253 SuperSpec Latex Primer Sealer
Second Coat:	Benjamin Moore	524 Aura Interior Eggshell
Third Coat:	Benjamin Moore	524 Aura Interior Eggshell

Interior Drywall, Semi-Gloss

First Coat:	Benjamin Moore	253 SuperSpec Latex Primer Sealer
Second Coat:	Benjamin Moore	528 Aura Interior Semi-Gloss
Third Coat:	Benjamin Moore	528 Aura Interior Semi-Gloss

Exterior Brick

First Coat:	ProSoCo Stand Off SLX100 Oil and Water Repellent Or Benjamin Moore P27 Clear Acrylic Sealer

Exterior CMU, Satin

First Coat:	Benjamin Moore	206 Super Spec Masonry Hi-Build Block Filler
Second Coat:	Benjamin Moore	634 Aura Exterior Low Lustre
Third Coat:	Benjamin Moore	634 Aura Exterior Low Lustre

Interior Wood Stain

First Coat:	Benjamin Moore	236 Benwood Wood Conditioner/ 238 Wood Grain Filler
Second Coat:	Benjamin Moore	205 Benwood Waterborne Stain
Third Coat:	Benjamin Moore	423 Stays Clear Acrylic Urethane Low Lustre
*Fourth Coat:	Benjamin Moore	423 Stays Clear Acrylic Urethane Low Lustre

END OF SECTION 09 91 00

GENERAL

1.1 SUMMARY

- A. Provide and install linoleum bulletin board where shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

PRODUCTS

2.1 LINOLEUM BULLETIN BOARD

- A. Linoleum bulletin boards are shown on the Drawings. Provide linoleum resilient homogeneous surface material with natural jute backing, applied to wall with manufacturer's adhesive.
- B. Acceptable Products
 - 1. Linoleum Bulletin Board by Forbo Industries, 1/4" gauge, 72" width. Fax 570/450-0258.

2.2 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.
- B. Aluminum Trim: A604-4 Panel Trim in satin aluminum finish by Hoskin & Muir, Inc. www.prohmi.com.
- C. Adhesives to substrate shall be per manufacturer's recommendations.
 - 1. Per Table 5.504.4.1 of the 2019 California Green Building Standards Code, adhesives, sealants and caulks used on the project shall meet the requirements of the following standards:
 - a. 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 of the 2010 California Green Building Standards Code. 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).

EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Securely install the approved adhesive products in accordance with the manufacturer's recommendations as approved by the Architect, setting panels straight, plumb, level, and true to the lines and levels shown on the Drawings, attached to the walls with the specified adhesive.

END OF SECTION 10 11 46

GENERAL

1.1 SUMMARY

- A. Provide and install all signage as shown on the Drawings and as specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.
 - 1. Product Data: Manufacturer's printed product data for each signage system indicated in this section.
 - 2. Comprehensive Signage Plan indicating all signs and signage systems to be installed on the Project cross-referenced to Fabrication Drawings.
 - 3. Fabrication Drawings for all signs and signage components.
 - 4. Samples: Verification samples of signage systems minimum of 6 inches square of each type and color indicated.
 - 5. Installation Drawings and Details

1.4 REGULATORY REQUIREMENTS:

- A. Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines, ANSI A117.1, and State of California Building Code (CBC), latest editions.
- B. VOC Limitations: adhesives shall comply with South Coast Air Quality Management District (SCAQMD) Rule #1168.

1.5 CAMPUS STANDARDS

- A. All signage shall comply with UC DAVIS BUILDING SIGN PROGRAM document dated July 2014.

1.6 WARRANTY

- A. Manufacturer's standard lifetime warranty against material and manufacturing defects

PART 2 – PRODUCTS

2.1 INTERIOR PANEL SIGNS

- A. Basis of Design:
InPro SignScape, InPro Corporation
PO Box 406, Muskego, WI 53150 USA
Telephone 800-222-5556, Fax: 888-715-8407
E-mail: service@inprocorp.com
- B. Provide all signage systems from a single manufacturer.
- C. Materials and Production Style

1. Tactile (Raised Letter)
 - a. Provide rigid vinyl sign material consisting of .040" sheet bonded with .060" sheet backed with 6mm white or black foam pvc panel. Top layer is cut and assembled to create signage.
 2. Partial Inlay (Tamper Resistant Tactile Signage)
 - a. Provide rigid vinyl sign material consisting of .060" sheet bonded to 6mm white or black foam pvc panel that is engraved to receive .060" material. Top layer of .060" sheet is cut and assembled to create signage.
 3. Printed Sign Panels
 - a. Provide sign panels that are digitally printed with exterior grade UV curable inks. Panels may be first or second surface printed.
 - b. Panel materials and thicknesses:
 - (1) 1/16" Clear PETG, adhered to 10mm white foamed PVC backing
 - (2) Maximum panel size 4' x 8'.
 4. Grade 2 Braille
 - a. Provide Grade 2 Braille produced with the Raster™ Method, patented process for placing Braille on signage. Raster™ Braille is computer engineered using a carbide-engraving bit, press-fit tool with vacuum pump and UV stable acrylic rasters.
- D. Sign Shapes and Sizes
1. Provide restroom signs with the following characteristics:
 - a. Women: 12" diameter circle.
 - b. Men: Equilateral triangle with 12" long edges and vertex pointing upward.
 - c. Unisex: Equilateral triangle superimposed within a 12" diameter circle.
 2. Other signs as detailed on the Drawings
- 2.2 DIMENSIONAL CHARACTERS
- A. Flat-cut 1/2" thick aluminum characters, factory painted in color selected by Architect, spacer stud mounted, height and font per Drawings, Gemini Sign Products, or equal.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Examine areas and conditions in which the signage system will be installed.
 1. Complete all finishing operations, including painting, before beginning installation of signage systems.
 2. Wall surface shall be dry and free from dirt, grease and loose paint.

3.2 PREPARATION

- A. General: Prior to installation, clean substrate to remove dust, debris and loose particles.

3.3 INSTALLATION

- A. General: Locate the signage system as indicated on the approved detail drawing for the appropriate substrate and in compliance with manufacturer's installation instructions. Install signage systems level and plumb at the height indicated on the drawings.

3.4 CLEANING

- A. At completion of the installation, clean surfaces in accordance with manufacturer's clean up and maintenance instructions.

END OF SECTION 10 14 00

GENERAL

1.1 SUMMARY

- A. Provide and install Solid Color Reinforced Composite (SCRC) Substrate toilet compartments as shown on the Drawings and as specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 10-year experience manufacturing similar products.
- B. Installer Qualifications: Minimum 2-year experience installing similar products.
- C. Single Source Requirements: To the greatest extent possible provide products from a single manufacturer.
- D. Accessibility Requirements: Comply with requirements applicable in the jurisdiction of the project, including but not limited to ADA and ICC/ANSI A117.1 requirements as applicable.
- E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship is approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.5 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Handling: Handle materials to avoid damage.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.9 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard 25-year limited warranty for panels, doors, and stiles against breakage, corrosion, delamination, and defects in factory workmanship. Manufacturer's standard 1-year guarantee against defects in material and workmanship for stainless steel door hardware and mounting brackets.

PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Bobrick Washroom Equipment, Inc., which is located at: 6901 Tujunga Ave.; North Hollywood, CA 91605-6213; Tel: 818-764-1000; Fax: 818-765-2700; Email:info@bobrick.com; Web:www.bobrick.com
- B. Basis of Design Products: Based on the quality and performance requirements of the project, specifications are based solely on the products of Bobrick Washroom Equipment, Inc. www.bobrick.com. Location of manufacturing shall be the United States.
- C. Substitutions: The Architect will consider products of comparable manufacturers as a substitution, pending the Contractor's submission of adequate documentation of the substitution in accordance with procedures in Division 1 of the Project Manual. Documentation shall include a list of five similar projects of equivalent size where products have been installed for a minimum of two years, and manufacturer's certification that products are fabricated in the United States.
- D. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 SOLID COLOR REINFORCED COMPOSITE (SCRC) SUBSTRATE

- A. Solid Color Reinforced Composite (SCRC) Toilet Partitions
 - 1. Design Type
 - a. Standard Height
 - (1) Door/Panel Height: 58 inches (147 cm).
 - (2) Floor Clearance: 12 inches (30 cm).
 - b. Maximum Height
 - (1) Door/Panel Height: 72 inches (183 cm).
 - (2) Floor Clearance: 4 inches (10 cm).
 - 2. Privacy Style Partitions: No sightlines with gap-free interlocking doors and stiles routed 0.300 inches (7.6 mm) from the edge to allow for 0.175 inch (4.4 mm) overlap to prevent line-of-sight into the toilet compartment. Privacy strips fastened or adhered onto the partition material are not acceptable.
 - 3. Mounting
 - a. Floor-mounted, overhead-braced with satin finish, extruded anodized aluminum headrails, 0.065 inch (1.65 mm) thick with anti-grip profile.
 - (1) Stile Maximum Height: 83 inches (211 cm).
- B. Materials: Solid color reinforced composite (SCRC) material for stiles, panels, doors, and screens with Bobrick Graffiti Off coating, thermoset and integrally fused into homogenous piece; high density polyethylene (HDPE), high density polypropylene not acceptable.
 - 1. Composition: Dyes, organic fibrous material, and polycarbonate/phenolic resins.

2. Surface Treatment: Non-ghosting, graffiti resistant surface integrally bonded to core through a manufacturing steps requiring thermal and mechanical pressure.
 3. Edges: Same color as the surface.
 4. Color: As selected by Architect from manufacturer's standard range
- C. Performance Requirements
1. Graffiti Resistance (ASTM D 6578): Passed cleanability test; 5 staining agents.
 2. Scratch Resistance (ASTM D 2197): Maximum load value exceeds 10 kilograms.
 3. Impact Resistance (ASTM D 2794): Maximum impact force exceeds 30 inch-pounds.
 4. Smoke Developed Index (ASTM E 84): Less than 450.
 5. Flame Spread Index (ASTM E 84): Less than 75.
 6. National Fire Protection Association/International Building Code Interior Wall and Ceiling Finish: Class B.
 7. Uniform Building Code: Class II.
- D. Finished Thickness
1. Stiles and Doors: 3/4 inch (19 mm).
 2. Panels and Screens: 1/2 inch (13 mm).
- E. Stiles: Floor-anchored stiles furnished with expansion shields and threaded rods
1. Leveling Devices: 7-gauge, 3/16 inches (5 mm) thick, corrosion-resistant, chromate-treated, double zinc-plated steel angle leveling bar bolted to stile; furnished with 3/8 inch (10 mm) diameter threaded rods, hex nuts, lock washers, flat washers, spacer sleeves, expansion anchors, and shoe retainers.
 2. Stile Shoes: One-piece, 22-gauge (0.8 mm), 18-8, Type 304 stainless steel, 4-inch (102 mm) height; tops with 90 degree return to stile. One-piece shoe capable of adapting to 3/4-inch (19 mm) or 1-inch (25 mm) stile thickness and capable of being fastened (by clip) to stiles starting at wall line.
- F. Wall Posts: Pre-drilled for door hardware, 18-8, Type 304, 16-gauge (1.6 mm) stainless steel with satin finish; 1-inch (25 mm) x 1-1/2 inches (38 mm) x 58 inches high (1473 mm)
- G. Anchors: Expansion shields and threaded rods at floor connections as applicable. Threaded rods secured to supports above ceiling as applicable. Supports above ceiling furnished and installed as Work of Section 05 50 00 - Metal Fabrications.
- H. Hardware: Chrome-plated "Zamak", aluminum, extruded plastic hardware not acceptable.
1. Compliance: Operating force of less than 5 lb. (2.25 kg).
 2. Emergency Access: Hinges, door latch allow door to be lifted over keeper from outside compartment on inswing doors.
 3. Materials: 18-8, Type 304, heavy-gauge stainless steel with satin finish.
 4. Doorstops: Prevents in swinging doors from swinging out beyond stile; on outswing doors, doorstop prevents door from swinging in beyond stile.
 5. Fastening: Hardware secured to door and stile by through-bolted, theft-resistant, pin-in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts. Fasteners secured directly into core not acceptable.

- a. Threaded Brass Inserts: Factory-installed; withstand direct pull force exceeding 1500 lb. (680 kg) per insert.
6. Clothes Hooks: Projecting no more than 1-1/8 inch (29 mm) from face of door.
7. Door Latch: Track of door latch prevents inswing doors from swinging out beyond stile; on outswing doors, door keeper prevents door from swinging in beyond stile; 16-gauge (1.6 mm) sliding door latch, 14-gauge (2 mm) keeper.
8. Locking: Door locked from inside by sliding door latch into keeper.
9. Hinge Type
 - a. Standard
 - (1) Balanced, with field-adjustable cam to permit door to be fully closed or partially open when compartment is unoccupied.
 - b. Full-Height Institutional Hinge
 - (1) Hinges: 16 gauge (1.6 mm) stainless steel, self-closing, 3 section hinges.
10. Mounting Brackets
 - a. Standard Concealed
 - (1) Mounting Brackets: Mounted inside compartment; exposed brackets on exterior of compartment not acceptable with the exception of outswing doors.
 - b. Full-Height
 - (1) Mounting Brackets: 18 gauge (1.2 mm) stainless steel and extend full height of panel.
 - (2) U-Channels: Secure panels to stiles.
 - (3) Angle Brackets: Secure stiles-to-walls and panels to walls.

EXECUTION

3.1 PREPARATION

- A. Prepare substrates including but not limited to blocking and supports in walls and ceilings at points of attachment using methods recommended by the manufacturer for achieving the best result for the substrates under the project conditions.
 1. Inspect areas scheduled to receive compartments for correct dimensions, plumbness of walls, and soundness of surfaces that would affect installation of mounting brackets.
 2. Verify spacing of plumbing fixtures to assure compatibility with installation of compartments.
- B. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
- C. Do not proceed with installation until substrates have been properly prepared with blocking and supports in walls and ceilings at points of attachment and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

3.2 INSTALLATION

- A. Install products in strict compliance with manufacturer's written instructions and recommendations, including the following:
 - 1. Verify blocking and supports in walls and ceilings has been installed properly at points of attachment.
 - 2. Verify location does not interfere with door swings or use of fixtures.
 - 3. Use fasteners and anchors suitable for substrate and project conditions.
 - 4. Install units rigid, straight, plumb, and level.
 - 5. Conceal evidence of drilling, cutting, and fitting to room finish.
 - 6. Test for proper operation.

3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust hardware for proper operation after installation. Set hinge cam on in-swinging doors to hold doors open when unlatched. Set hinge cam on out-swinging doors to hold unlatched doors in closed position.
- B. Touch-up, repair or replace damaged products.
- C. Clean exposed surfaces of compartments, hardware, and fittings.

END OF SECTION 10 21 13 .19

GENERAL

1.1 SUMMARY

- A. Provide and Install toilet accessories as shown on the Toilet Accessories Schedule on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.

PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, No. 4 finish (satin), 0.0312-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.
- B. Brass: ASTM B 19, ASTM B 16 (ASTM B 16M), or ASTM B 30.
- C. Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063-T6 or 6463-T6.
- D. Sheet Steel: ASTM A 1008/A 1008M, 0.0359-inch (0.9-mm) minimum nominal thickness.
- E. Galvanized-Steel Sheet: ASTM A 653/A 653M, G60 (Z180).
- F. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- G. Baked-Enamel Finish: Factory-applied, gloss-white, baked-acrylic-enamel coating.
- H. Tempered Glass: ASTM C 1048, Kind FT (fully tempered).
- I. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- J. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- K. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.
- L. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Architect.

2.2 TOILET ACCESSORIES

- A. Basis of design shall be Bobrick. All toilet accessories shall be as scheduled on the Drawings.

2.3 FASTENINGS

- A. All toilet accessories shall be complete with all required fastenings for installation on the wall surface and structure to be mounted to, and all fastenings shall harmonize with the item being fastened.

EXECUTION

3.1 INSTALLATION

- A. Install all toilet accessories where indicated on the Drawings and in full accordance with the manufacturer's recommendations, anchoring all components fully in place for long life under hard use.
- B. Install accessories using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- C. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.
- D. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items. Remove temporary labels and protective coatings.

END OF SECTION 10 28 00

GENERAL

1.1 SUMMARY:

- A. Provide and install manufactured direct vent gas fireplace as detailed on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

1.4 REFERENCES

- A. ANSI Z233/ NFPA 54 – National Fuel Gas Code.
- B. ANSI/NFPA 70 - National Electric Code.
- C. California Mechanical Code, latest adopted edition.
- D. California Electric Code, latest adopted edition.

1.5 DESIGN / PERFORMANCE REQUIREMENTS

- A. Appliances are CSA marked as Certified to US Standard CLASS 2901 04 - DOMESTIC HEATERS (GAS) Vented Fireplace
- B. Direct Vent appliances shall be electrically grounded in accordance with the local codes or, in the absence of local codes, with National Electric code, ANSI/NFPA 70.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in accordance with the manufacturer's instructions. Store indoors in manufacturer's unopened packaging until ready for installation.

1.7 WARRANTY

- A. Provide the manufacturer's product body and firebox 10 Year Limited Warranty and the ceramic glass 5 Year limited warranty against thermal breakage.

PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: ORTAL USA, Inc., which is located at: 8421 Canoga Ave.; Canoga Park, CA 91304; Tel: 818-238-7000; Fax: 818-678-0541; Email: [request info \(info@ortalheat.com\)](mailto:info@ortalheat.com); Web: www.ortalheat.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 – Product Options & Substitutions.

2.2 MANUFACTURED DIRECT VENT GAS FIREPLACES

- A. Model: Corner 75 LS
 - 1. Glass Viewing Area

- a. Front: 30-15/16" wide x 18-7/8" high
 - b. Left Side: 16-3/16" wide x 18-7/8" high
2. Heat Barrier:
 - a. Double Glass: Double pane glass with fan assistance (ceramic inner, tempered outer). Requires air intake below the firebox.
3. Maximum Heat Output (BTU) NG: 29,100
4. Efficiency NG: 77.8 percent
5. Heat Release: Required, 124 square inches of net free air space
6. Air Intake: 124 square inches of net free air space
7. Vent Pipe
 - a. UL listed 4x6 co-axial direct vent pipe (4" interior, 6-5/8" exterior)
 - (1) Olympia ("Ventis" line) or equal, with rain cap
 - (2) Coordinate vent pipe termination with chimney shroud specified in Section
8. Decorative Media:
 - a. Aspen Log Set
 - b. Large Gray Stones
9. Interior:
 - a. Standard matte black interior finish (no interior panels).
10. Controls: With on/off, temperature, flame height operation.
 - a. Wall Switch.

EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Framing and openings must be completed before starting installation. Consult manufacturer Installation Manual for clearance, framing, and installation details.
- C. Electrical wiring and gas supply line must be completed before installation of the firebox. Consult manufacturer Installation Manual for electrical and gas requirements.
- D. Prepare openings using the recommendations of the manufacturer for achieving the best result for the under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, ANSI Z223.1/NFPA 54, California Mechanical Code, California Electric Code, and the requirements of authorities having jurisdiction.

- B. Use manufacturer's guidelines for minimum clearances to combustibles, walls, and finishes.
- C. Upon completion of installation, visually inspect all exposed surfaces. Touch up scratches and abrasions with touch up paint recommended by the manufacturer.

3.4 DEMONSTRATION

- A. Demonstrate the operation and control of the installed unit to the Owner after completion of the Work.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 10 31 00

GENERAL

1.1 SUMMARY

- A. Provide and install hand portable fire extinguishers and metal cabinets as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.
- B. Provide literature and/or drawings of fire extinguisher cabinets including lettering, colors and finish.

PRODUCTS

2.1 FIRE EXTINGUISHERS

- A. All fire extinguishers shall have a minimum UL rating of 2A:10BC and shall be Potter-Roemer Inc., Model #3005, or an equal approved in advance by the Architect.

2.2 CABINETS

- A. Type and style
 - 1. All fire extinguisher cabinets shall be metal, semi-recessed sized to fit within the partition or wall depth.
- B. Finish
 - 1. All fire extinguisher cabinets shall be Oxidized Brass finish.
- C. Manufacturers
 - 1. Design is based on Potter Roemer Inc.
 - a. Model 7072 Semi-Recessed
 - b. 3903 Wall Mounted Bracket
 - 2. All fire extinguisher cabinets shall be the products of the same manufacturer and shall be the ones upon which design was based, or an equal approved in advance by the Architect.
 - 3. All fire extinguisher cabinets must be approved for use by local fire department.

2.3 MOUNTING BRACKETS

- A. Manufacturer's steel, designed to secure fire extinguishers to wall or structure, of sizes required for fire extinguishers indicated, with plated or baked enamel finish.

EXECUTION

3.1 SURFACE CONDITIONS

- A. Coordinate with all other trades as required to ensure proper and adequate provision in framing and wall covering for the installation of the recessed cabinets in the locations required.
- B. Prior to installation, inspect all cabinet recesses and verify that all necessary provisions have been made. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 INSTALLATION

- A. Install the firefighting devices where indicated on the Drawings and in full accordance with all pertinent regulations and the manufacturer's recommendations, setting the top of the cabinet as shown on the Drawings, anchoring all components firmly in place for long life under hard use.

3.3 SERVICE

- A. Determine the approximate completion date of the Work and then inspect, charge, and tag the fire extinguishers at a date not more than ten days before actual completion date of the work.

END OF SECTION 10 44 13

GENERAL

1.1 DESCRIPTION

- A. Provide and install kitchen appliances as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.

1.4 REGULATORY REQUIREMENTS

- A. Comply with provisions of the following product certifications:
 - 1. NFPA: Provide electrical appliances listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 2. UL and NEMA: Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable NEMA standards.
 - 3. ANSI: Provide gas-burning appliances that comply with ANSI Z21 Series standards.
 - 4. NAECA: Provide residential appliances that comply with NAECA standards.

1.5 ACCESSIBILITY

- A. Where residential appliances are indicated to comply with accessibility requirements, comply with ANSI A117.1 and the latest edition of the California Building Code (CBC).

1.6 ENERGY RATINGS

- A. Provide appliances that qualify for the EPA/DOE ENERGY STAR product labeling program.

PRODUCTS

2.1 DISHWASHER

- A. ASKO Model DBI663IS 30 series stainless steel, or equal.

EXECUTION

3.1 COORDINATION

- A. Coordinate all interface requirements for electrical and mechanical connections in a timely manner to permit orderly progress of the Work.

3.2 INSTALLATION

- A. General: Install the kitchen equipment in strict accordance with the manufacturer's recommendations, the approved Shop Drawings, the original design, and all pertinent codes and regulations, anchoring all components securely, level and plumb.

- B. Inspection: Upon completion of the installation, put all operable components through at least two complete operating cycles and verify that all components are properly adjusted and working in accordance with their design intent.
- C. Verify that accessories required have been furnished and installed.
- D. Touch-up: Touch up all scratches and abrasions to be completely invisible to the unaided eye from a distance of five feet.

END OF SECTION 11 31 00

GENERAL

1.1 SUMMARY

- A. Provide and install interior book return as shown on the Drawings and specified herein.

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Handling: Handle materials to avoid damage.

1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: American Book Returns, part of the American Security Cabinets Family, or equal

2.2 PRODUCTS

- A. Book Depositories: American Book Returns Model HCU Thru Wall
 - 1. Construction: Steel, powder coated.
 - 2. M810 Book Truck

EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction. Test for proper operation and adjust until satisfactory results are obtained.

3.4 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION 11 51 00

GENERAL

1.1 SUMMARY

- A. Provide and install manual roller window shades and accessories as shown on the Drawings and as specified herein.

1.2 GENERAL REQUIREMENTS

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS

- A. Make submittals to the Architect in accordance with the provisions of Section 013323 of these specifications.
- B. Product Data: Manufacturer's catalog data, product descriptions, installation instructions, detail sheets, and specifications for each type system specified.
- C. Samples for Selection: Manufacturer's color chart or sample set.
- D. Shop Drawings: Prepared specifically for this project; show dimensions and interface with other products.
 - 1. Room schedule including field-verified dimensions of each opening to receive window shade systems.
 - 2. Indicate System Series, fabric selection, and mounting type.

1.4 QUALITY ASSURANCE

- A. Installer: Approved by manufacturer.
- B. Provide manufacturer's standard ten-year warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to project site in manufacturer's original cartons.
- B. Individually package and mark shades with room number and opening number.
- C. Inspect the materials upon delivery to assure that specified products have been received.
- D. Store and handle shades to prevent damage to fabrics prior to installation.

PRODUCTS

2.1 MANUFACTURERS

- A. MechoShade Systems, Inc.; 42-03 35th, Long Island, NY 11101. Tel: (718) 729-2020, Fax: (718) 729-2941.
- B. FlexShade System by Draper, Inc. 411 South Pearl Street, Spiceland IN 47385; phone (765) 987-7999, fax (765) 987-7142.
- C. Substitutions: See Section 012500 - Product Requirements.
- D. Provide all window shade systems from a single manufacturer.

2.2 MANUFACTURED UNITS

- A. Single sunscreen shade cloth manually operated by bead chain. Install in SlimLine or Wide Bracket, as appropriate for application. Where multiple adjacent shadebands occur, provide SnapLoc Fascia to create the appearance of a continuous assembly. Where brackets are exposed, provide SnapLoc Fascia to conceal shade assembly. See Finish Schedule on the Drawings for fabric selection.

EXECUTION

3.1 INSTALLATION

- A. Install window shade systems in accordance with manufacturer's instructions and these specifications.
- B. Assume responsibility for all field dimensions and mounting surfaces.
- C. Adjust window shade systems for proper operation.

END OF SECTION 12 24 13

PART 1 - GENERAL

1.01 CONDITIONS

- A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements apply to the work specified in this Section.

1.02 DESCRIPTION

- A. Work includes but is not limited to the following:
 - 1. Furnish all labor, materials, tools, equipment, operation or methods listed, mentioned or scheduled on the Contract Documents and/or herein specified in this Section.
 - 2. Although such Work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
 - 3. Completely coordinate with work of all other trades.

1.03 QUALITY ASSURANCE

- A. All products or items described herein shall be new, unless otherwise specified, and shall be from the specified manufacturer or approved equal. Products shall be complete in all respects, properly installed, and in perfect working order.

1.04 QUALIFICATION OF INSTALLER

- A. Installer shall be thoroughly trained and experienced in the skills required and shall be completely familiar with the products and their installation as specified on the Contract Documents and in this Section. Installer shall be present at all times during progress of Work of this Section and shall direct all work performed.

1.05 COORDINATION

- A. Contractor shall be charged with the responsibility of making arrangements for the coordination of his construction operations with those of all others on the job, and he shall permit other forces so engaged to accomplish their portion of the Work without undue interference or delay.
- B. Contractor shall place order for all site furnishings and equipment immediately after award of bid to ensure adequate time for manufacturing, shipping and installation. If any materials or equipment are not ordered in time, additional costs made by equipment manufacturers to their equipment in time to meet construction schedule together with any special handling costs, shall be borne by the Contractor. **NO** project extension shall be granted due to improper lead time in ordering.

1.06 SUBMITTALS

- A. Submit one (1) digital copy of manufacturer's catalog cuts off all products for Owner's Representative approval. Catalog cuts shall clearly identify product, finishes, color, schedule and installation.
- B. All approvals must be granted prior to ordering product.

PART 2 - PRODUCTS

2.01 BENCHES

- A. Provide bench, model: BH1880T, 6'-0" long Beacon Hill Thermory bench with back and arm rests. Color shall be Textured Pewter / Thermory.

Or approved equal.

Manufactured by:
Anova Furnishings
Contact: Bob Evans | (314)495-8357

2.02 PICNIC TABLE

- A. Provide 42" square picnic table, model: BH1840T, Beacon Hill Thermory picnic table with four (4) seats with backs. Color shall be Textured Pewter / Thermory.
- B. Provide 42" square picnic table, model: BH1830T, Beacon Hill Thermory picnic table with three (3) seats with backs. Color shall be Textured Pewter / Thermory.

Or approved equal.

Manufactured by:
Anova Furnishings
Contact: Bob Evans | (314)495-8357

2.03 TRASH RECEPTACLE

- A. Provide 70-gallon dual receptacle/recycler, model: BH1870T, Beacon Hill Thermory with two 35-gallon plastic liners and rubber leveling feet. Color shall be Textured Pewter / Thermory.
- B. Decals for each opening shall be:
- a. "Bottles/Cans" with recycling logo. Color: White
 - b. "Trash". Color: White

Or approved equal.

Manufactured by:
Anova Furnishings
Contact: Bob Evans | (314)495-8357

2.04 BIKE RACK

- A. Provide circular bike rack, model: CIRBLEBR, circle shaped powder coated steel rack, surface mount. Color shall be black.

Or approved equal.

Manufactured by:
Anova Furnishings
Contact: Bob Evans | (314)495-8357

PART 3 - EXECUTION

3.01 INSTALLATION OF BENCHES

- A. Locate benches as indicated on Contract Documents for Owner's Representative approval prior to installation.
- B. Install items level and plumb.
- C. Directly embed supports into concrete footing as detailed on the Contract Documents and in conformance with manufacturer's specifications.

3.02 INSTALLATION OF PICNIC TABLES

- A. Locate benches as indicated on Contract Documents for Owner's Representative approval prior to installation.
- B. Install items level and plumb on Decomposed Surface
- C. Chain picnic tables as detailed on the Contract Documents and in conformance.

3.03 INSTALLATION OF TRASH RECEPTACLE

- A. Locate picnic tables and benches as indicated on Contract Documents for Owner's Representative approval prior to installation.
- B. Install items level and plumb.
- C. Surface mount to concrete paving as detailed on the Contract Documents and in conformance with manufacturer's specifications. Contractor shall supply all hardware required for surface mounting.

3.04 PROTECTION

- A. Adequately protect all work from damage by subsequent construction operations. Damaged work shall be replaced by Contractor and at Contractor's expense.

END OF SECTION 12 92 00

SECTION 22 05 00

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. The requirements of the GENERAL CONDITIONS, SUPPLEMENTAL CONDITIONS, and DIVISION 1, GENERAL REQUIREMENTS, apply to the work of this SECTION.

1.2 SUMMARY

- A. This Section includes the following basic mechanical materials and methods to complement other DIVISION 22 & 23 sections.
 - 1. Piping materials and installation instructions common to most piping systems.
 - 2. Equipment nameplate data requirements.
 - 3. Non-shrink grout for equipment installations.
 - 4. Installation requirements common to equipment specification Sections.
 - 5. Mechanical demolition.
- B. Pipe and pipe fitting materials are specified in piping system Sections.

1.3 DEFINITIONS

- A. Pipe, pipe fittings, and piping include tube, tube fittings and tubing.
- B. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below the roof, spaces above ceiling, un-excavated spaces, crawl spaces, and tunnels
- C. Exposed Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- D. Exposed Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- E. Concealed Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
- F. Concealed Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.4 SUBMITTALS

- A. Product Data: Submit PDF copies of the manufacturer's technical product data and installation instructions for each type of material listed in this SECTION. Receive written approval prior to ordering.
- B. Maintenance Data: Submit PDF copies of maintenance data and replacement material lists for each type of material listed in this section. Include this data and product data in maintenance manual.

1.5 QUALITY ASSURANCE

- A. Quality welding processes and operators for structural steel according to AWS D1.1 "Structural Welding Code – Steel."
- B. Qualify welding processes and operators for piping according to ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications."
 - 1. Comply with provisions of ASME B31 Series "Code for Pressure Piping."
 - 2. Certify that each welder has passed AWS qualification tests for the welding processes involved and that certification is current.
- C. ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver pipes and tubes with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.
- B. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. When stored inside, do not exceed structural capacity of the floor.
- C. Protect flanges, fittings, and piping specialties from moisture and dirt.

1.7 SEQUENCING AND SCHEDULING

- A. Coordinate mechanical equipment installation with other building components.
- B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for mechanical installations.
- C. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning prior to closing in the building.
- D. Coordinate connection of electrical services.
- E. Coordinate requirements for access panels and doors where mechanical items requiring access are concealed behind finished surfaces.
- F. Coordinate installation of identifying devices after completing covering and painting where devices are applied to surfaces.

PART 2 PRODUCTS

2.1 PIPE AND PIPE FITTINGS

- A. Refer to individual piping system specification Sections in Division 22 and 23 for special joining materials not listing below.
- B. Pipe Threads: ASME B1.20.1 for factory threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

- A. Refer to individual piping system specification Sections in Division 22 and 23 for special joining materials not listed below.
- B. Pipe Flange Gasket Materials: Suitable for the chemical and thermal conditions of the piping system contents.
- C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, except where other material is indicated.
- D. Solder Filler Metal: ASTM B32
 - 1. Alloy Sn95 or Alloy Sn94: Tin (approximately 95%) and silver (approximately 5%) having 0.10% maximum lead content.
 - 2. Alloy E: Tin (approximately 95%) and copper (approximately 5%), having 0.10% maximum lead content.
 - 3. Alloy HA: Tin-antimony-silver-copper-zinc, having 0.10% maximum lead content.
 - 4. Alloy HB: Tin-antimony-silver-copper-nickel, having 0.10% maximum lead content.
 - 5. Alloy Sb5: Tin (95%) and antimony (5%), having 0.20% maximum lead content.
- E. Brazing Filler Metals: AWS A5.8.
 - 1. BCuP Series: Copper-phosphorus alloys.
 - 2. BAg1 Series: Silver alloy.
- F. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- G. Flanged, Ductile-Iron Pipe Gasket, Bolts, and Nuts: AWWA C110, rubber gasket, carbon steel bolts and nuts.
- H. Couplings: Iron body sleeve assembly, fabricated to match outside diameters of plain-end pressure pipes.
 - 1. Sleeve: ASTM A 126, Class B, gray iron.
 - 2. Followers: ASTM A 47 (ASTM A 47M), Grade 32510 or ASTM A 536 ductile iron.
 - 3. Gaskets: Rubber.
 - 4. Bolts and Nuts: AWWA C111.
 - 5. Finish Enamel paint.

2.3 PIPING SPECIALTIES

- A. Escutcheons: Manufactured wall, ceiling, and floor plates; deep-pattern type where required to conceal protruding fittings and sleeves.
- B. Dielectric Fittings: Assembly or fitting having insulating material isolating joined dissimilar metals to prevent galvanic action.
 - 1. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld neck end types and matching piping system materials.
- C. Sleeves: The following materials are for wall, floor, slab, and roof penetrations:
 - 1. Steel Sheet-Metal: 24-gage (0.70mm) or heavier galvanized sheet metal, round tube closed with welded longitudinal joint

2. Steel Pipe: ASTM A 53, Type E, Grade A, Schedule 40, galvanized, plain ends.

2.4 GROUT

- A. Non-shrink, Nonmetallic Grout: ASTM C 1107, Grade B.
 1. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, non-staining, non-corrosive, nongaseous, and recommended for interior and exterior applications.
 2. Design Mix: 5000-psi (34.50mpa), 28-day compressive strength.
 3. Packaging: Premixed and factory-packaged.

PART 3 EXECUTION

3.1 PIPING SYSTEMS --COMMON REQUIREMENTS

- A. General: Install piping as described below, except where system Sections specify otherwise. Individual piping system specification Sections in Division 22 specify piping installation requirements unique to the piping system.
- B. General Locations and Arrangements: Drawings (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, and other design considerations. Install piping as indicated, except where deviations to layout are approved on coordination drawings.
- C. Install components having pressure ratings equal to or greater than system operating pressure.
- D. Install piping free of sags and bends.
- E. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.
- F. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.
- G. Install piping to allow application of insulation plus 1-inch (25mm) clearance around insulation.
- H. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
- I. Install fittings for changes in direction and branch connections.
- J. Install couplings according to manufacturer's printed instructions.
- K. Install sleeves for pipes passing through concrete and masonry walls, concrete floor and roof slabs, and where indicated.
- L. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, concrete floor and roof slabs, and where indicated.
- M. Fire Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestopping sealant material using methods approved by the Fire Marshall.

- N. Verify final equipment locations for roughing in.
- O. Refer to equipment specifications in other Sections for rough-in requirements.
- P. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping system Sections.
 - 1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
 - 2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
 - 3. Soldered Joints: Construct joints according to AWS "Soldering Manual," Chapter 22 "The Soldering of Pipe and Tube."
 - 4. Brazed Joints: Construct joints according to AWS "Brazing Manual" in the "Pipe and Tube" chapter.
 - 5. 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 inside diameter. Join pipe fittings and valves as follows:
 - a. Note the internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
 - b. Apply appropriate tape or thread compound to external pipe threads (except where dry seal threading is specified).
 - c. Align threads at point of assembly.
 - d. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
 - e. Damaged Threads: Do not use pipe or pipe fittings having threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
 - 6. Welded Joints: Construct joints according to AWS D10.12 "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe" using qualified processes and welding operators according to the "Quality Assurance" Article.
 - 7. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.
- Q. Piping Connections: Except as otherwise indicated, make piping connections as specified below.
 - 1. Install unions in piping 2 inches and smaller adjacent to each valve and at final connection to each piece of equipment having a 2-inch or smaller threaded pipe connection.
 - 2. Install flanges in piping 2-1/2 inches and larger adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
 - 3. Dry Piping Systems (Gas, Compressed Air, and Vacuum): Install dielectric unions and flanges to connect piping materials of dissimilar metals.
 - 4. Wet Piping Systems (Water and Steam): Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.2 EQUIPMENT INSTALLATION -- COMMON REQUIREMENTS

- A. Install equipment to provide the maximum possible headroom where mounting heights are not indicated.
- B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to the Architect.
- C. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
- D. Install equipment giving right-of-way to piping systems installed at a required slope.

3.3 PAINTING AND FINISHING

- A. Refer to Division 9 Section "Painting" for field painting requirements.
- B. Damage and Touch Up: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.4 CUTTING AND PATCHING

- A. Install nonmetallic nonshrink grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors. Mix grout according to manufacturer's printed instructions.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms for placement of grout, as required.
- D. Avoid air entrapment when placing grout.
- E. Place grout to completely fill equipment bases.
- F. Place grout on concrete bases to provide a smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout according to manufacturer's printed instructions.

END OF SECTION

SECTION 22 05 29

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal pipe hangers and supports.
 - 2. Trapeze pipe hangers.
 - 3. Thermal-hanger shield inserts.
 - 4. Fastener systems.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Hangers and supports for plumbing piping shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Welding certificates.

1.4 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: Pre-galvanized 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.

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 THERMAL-HANGER SHIELD INSERTS

- A. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig minimum compressive strength and vapor barrier.
- B. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- C. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- D. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.4 FASTENER SYSTEMS

- A. Mechanical-Expansion Anchors: Insert-wedge-type, 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.

2.5 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, 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. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

D. Fastener System Installation:

1. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

F. 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.

G. Install lateral bracing with pipe hangers and supports to prevent swaying.

H. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

I. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

J. 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.

K. 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 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 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: 12 inches long and 0.048 inch thick.
- b. NPS 4: 12 inches long and 0.06 inch thick.

5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers.

- 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.

3.3 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.

3.4 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.
- 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.

END OF SECTION

SECTION 22 07 19
PLUMBING PIPING INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes insulating the following plumbing piping services:
 - 1. Domestic Hot Water piping.
 - 2. Heating Hot Water piping.
 - 3. Roof drains and rainwater leaders.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

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.

PART 2 PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with insulation requirements in Plumbing Material Specification on plans.
- B. Products shall not contain formaldehyde, 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, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pittsburgh Corning Corporation; Foamglas.
 - 2. Special-Shaped Insulation: ASTM C 552, Type III.

3. Preformed Pipe Insulation with Factory-Applied ASJ: Comply with ASTM C 552, Type II, Class 2.
 4. 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, available products that may be incorporated into the Work include, but are not limited to, 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 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. 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, available products that may be incorporated into the Work include, but are not limited to, 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).
- C. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, 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.
- D. 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, available products that may be incorporated into the Work include, but are not limited to, 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; 85-20.
 - d. Mon-Eco Industries, Inc.; 22-25.

2.3 SEALANTS

A. Joint Sealants:

1. Joint Sealants for Cellular-Glass Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
 - b. Eagle Bridges - Marathon Industries; 405.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Permanently flexible, elastomeric sealant.
4. Service Temperature Range: Minus 100 to plus 300 deg F.
5. Color: White or gray.

B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, 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.

2.4 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.

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 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 plan 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.
- 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.

3.3 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 Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- C. 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.
- D. 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."

3.4 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. 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.

3.5 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.

3.6 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.

3.7 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.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.8 INDOOR PIPING INSULATION SCHEDULE

- A. Stormwater and Overflow: Insulation shall be the following:
 1. Flexible Elastomeric: 1 inch thick.
- B. Roof Drain and Overflow Drain Bodies: Insulation shall be the following:
 1. Flexible Elastomeric: 1 inch thick.

END OF SECTION

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.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 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 water tube, drawn temper.
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.

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 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 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: 150 psig.
 - c. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

2.5 FLEXIBLE CONNECTORS

- A. 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.

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.
- D. Install shutoff valve immediately upstream of each dielectric fitting.
- E. Install domestic water piping level and plumb.

- F. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- G. 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.
- H. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- I. Install piping adjacent to equipment and specialties to allow service and maintenance.
- J. Install piping to permit valve servicing.
- K. 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.
- L. Install piping free of sags and bends.
- M. Install fittings for changes in direction and branch connections.
- N. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
- O. Install pressure gages on suction and discharge piping from each plumbing pump and packaged booster pump.
- P. Install sleeves for piping penetrations of walls, ceilings, and floors.
- Q. Install sleeve seals for piping penetrations of concrete walls and slabs.

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. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Braze Joints" Chapter.
- D. 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."

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 or gate valves for piping NPS 2 and smaller. Use butterfly or gate 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.

1. Hose-End Drain Valves: At low points in water mains, risers, and branches.

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.

3.5 FLEXIBLE CONNECTOR INSTALLATION

A. Install flexible connectors in suction and discharge manifold connections to each domestic water booster pump.

B. Install bronze-hose flexible connectors in copper domestic water tubing.

3.6 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 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.

B. Support vertical piping and tubing at base and at each floor.

C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.

D. 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 5: 10 feet with 1/2-inch rod.

E. Install supports for vertical copper tubing every 10 feet.

F. Refer to plans for hanger details. Comply with this section or the plans, whichever is more stringent.

3.7 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.

3.8 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.

E. Prepare test and inspection reports.

3.9 CLEANING

A. Clean and disinfect potable domestic water piping 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 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three 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.

END OF SECTION

SECTION 23 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 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

PART 2 PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Pipe Material Schedule" on the plans.

2.2 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. Standard: ASTM C 1173.
 - b. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
 - c. Sleeve Materials:
 - 1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 - 2) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

PART 3 EXECUTION

3.1 EARTH MOVING

- A. Comply with requirements for excavating, trenching, and backfilling specified in Division 31.

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. 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.
- I. 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.
- J. 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; 1 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.
- K. 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."
- L. 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."

- M. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.3 JOINT CONSTRUCTION

- A. 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.

3.4 HANGER AND SUPPORT INSTALLATION

- A. 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 and vertical piping
 - 2. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 3. 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.
 - 4. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 5. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Support horizontal piping and tubing within 12 inches of each fitting and coupling.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- E. 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.
- F. Install supports for vertical cast-iron soil piping every 15 feet.
- G. Refer to plans for hanger details. Comply with this section or the plans, whichever is more stringent.

3.5 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.

3.6 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.

3.7 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.

END OF SECTION

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. Cast-Iron Floor Cleanouts:

1. 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:
 - a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - b. Watts Drainage Products Inc.
 - c. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M for threaded, adjustable housing cleanout.
3. Size: Same as connected branch.
4. Type: Threaded, adjustable housing.
5. Body or Ferrule: Cast iron.
6. Outlet Connection: Threaded.
7. Closure: Brass plug with straight threads and gasket.
8. Adjustable Housing Material: Cast iron with.
9. Frame and Cover Material and Finish: Nickel-bronze, copper alloy.
10. Frame and Cover Shape: Round.

11. Top Loading Classification: Medium Duty.
12. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.

B. Cast-Iron Wall Cleanouts:

1. 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:
 - a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - b. Watts Drainage Products Inc.
 - c. 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: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: Drilled-and-threaded 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.

2.2 FLOOR DRAINS

A. Cast-Iron Floor Drains:

1. 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:
 - a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - b. Watts Drainage Products Inc.
 - c. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.6.3.
3. Pattern: Floor drain.
4. Body Material: Gray iron.
5. Outlet: Bottom.
6. Coating on Interior and Exposed Exterior Surfaces: Acid-resistant enamel.
7. Top Material: Nickel bronze.
8. Top Shape: Round.
9. Top Loading Classification: Light Duty.
10. Trap Material: Cast iron.
11. Trap Pattern: Standard P-trap.

2.3 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 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
 - 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.
 - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
 - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.
 - 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 air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

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.

3.4 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

SECTION 22 40 00

PLUMBING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. The requirements of the GENERAL CONDITIONS, SUPPLEMENTAL CONDITIONS, and DIVISION 1, GENERAL REQUIREMENTS, apply to the work of this SECTION.

1.2 SUMMARY

- A. Provide plumbing where shown on the Drawings, as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to:
 - 1. Domestic hot and cold water piping systems
 - 2. Drain, waste, and vent systems
 - 3. Drain piping systems

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 220500.
- B. Record Drawings: At project closeout, submit Record Drawings of installed ductwork, duct accessories, and outlets and inlets in accordance with the requirements of Division 1.
- C. Sterilization certificate:
 - 1. Upon completion of water line sterilization, deliver to the Architect two copies of an acceptable "Certificate of Performance" for that activity.

1.4 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Codes and regulations:
 - 1. In addition to complying with the specified requirements, comply with pertinent regulations of governmental agencies having jurisdiction.
 - 2. In the event of conflict between or among specified requirements and pertinent regulations, the more stringent requirement will govern when so directed by the Architect.

PART 2 PART 2 – PRODUCTS

2.1 PIPE SCHEDULE

- A. Comply with requirements in "Plumbing Material Schedule" on plans for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 MATERIALS

- A. Galvanized or black steel pipe:
 - 1. Provide standard weight complying with ASTM A12.
- B. Fittings:
 - 1. For copper lines, provide wrought copper fittings.
 - 2. For cast iron lines, provide service weight cast iron type fittings.
 - 3. For steel lines, provide malleable iron fittings
- C. Unions:
 - 1. For copper lines, provide copper fittings.
 - 2. For connections in iron pipe lines 2-1/2" and smaller, provide ground joint brass-to-iron fittings.
- D. Victaulic fittings may be used where permitted by code.
- E. Strainers: Provide Y-pattern, 200# WOG, 20 mesh monel screen:
 - 1. 3" and smaller: Provide Crane #988-1/2 or equal, screwed.
- F. Pressure regulators: Provide Mueller H-9000, or Wilkins series 500, all bronze.
- G. Balancing cocks: Provide Bell & Gossett or equal.

2.3 FLASHING

- A. Where pipes of this Section pass through the roof, flash with 24 gauge galvanized sheet metal, counter-flashing to be 24 gauge sheet metal.

2.4 PIPE HANGERS – SEE SECTION 220529 PIPE HANGERS AND SUPPORTS

2.5 CLEANOUTS

- A. Exterior:
 - 1. Provide Smith #4253, Josam #8860 or equal with XH cast iron top in concrete areas.
- B. Floors:
 - 1. Provide Smith #4023, Josam #8330 or equal with round nickel-bronze top in finished room floors.
 - 2. Provide Smith #4223, Josam #8090-CAL or equal with round cast iron top in unfinished room floors.
 - 3. Provide "flush-with-floor" type cleanouts, with adjustable watertight covers and integral anchorage flange with clamping collar where waterproofing membrane is used.
- C. Finished walls:
 - 1. Provide Smith #4532, Josam #8790-4 or equal with round chrome plated or stainless steel access plate and screw.
- D. Provide cleanout plugs of extra heavy bronze.

2.6 ACCESS BOXES

A. Walls:

1. Provide Smith #4730 or Josam #8650 with polished chrome plate face in tile walls.
2. Provide Smith #4760-AKL OR #4765-AKL, Josam #SLA or #SLB or equal paint-grade steel face and with Allen lock in walls of other finished rooms.

B. Ceilings:

1. Provide Acorn #8211-3-AKL, Josam #SLA or equal paint-grade steel face with Allen lock.

C. Floors:

1. Provide Smith #4910, Josam #8630-5 or equal with XH plain aluminum or nickel-bronze non-skid top.
2. Provide Smith #4920 or equal for floors covered with vinyl reinforced or pure vinyl tile.

D. Yard boxes:

1. Provide Brooks 36 HF, Frazer #2 or equal cast concrete boxes with cast iron rim and hinged self-closing cast iron lid marked GAS SHUTOFF or WATER, size 12" x 18" x 12".

2.7 PRESSURE GAGES AND THERMOMETERS

- A. Provide Marsh Quality Gages with 4-1/2" dial, gage cock, in type required. For pump suction, provide compound type.
- B. Provide Trerice 9" BX series thermometers, straight, angle, or oblique as required, equipped with separable sockets and well. Provide extension necks as required on insulated line.
- C. Arrange thermometers for easy reading from the floor.

2.8 TRAPS

- A. For lavatories and sinks, except service sinks, provide Los Angeles pattern cast brass traps with brass nuts.

2.9 HANDICAPPED INSULATION

- A. Where shown on the Drawings or required by governmental agencies having jurisdiction, at lavatories for handicapped persons, provide insulation on hot water supply, tailpiece, and trap.

2.10 FIXTURES AND EQUIPMENT

- A. Provide plumbing fixture, trim, and equipment as shown on the Plumbing Fixture and Plumbing Equipment schedules on plans.

2.11 PIPE WRAPPING

- A. Steel piping in concrete or underground:
 1. Wrap with 20 mil tape
 2. Fittings and other joints: Wrap in the field with 20 mil tape and primer.
 3. Provide 50% overlap on tape weld rubber coating.

B. Testing:

1. Secure inspection and testing by an independent agency approved in advance by the Architect.

2.12 PIPE INSULATION

- A. Provide thickness per plan schedules, 3 ½ pound per cubic foot fiberglass with all-service jacket (aluminum jacket with stainless steel bands outdoors) for the following services:

1. Domestic hot water supply and return
2. Medium pressure steam
3. Gravity and pumped condensate return

2.13 SLEEVES

- A. Where pipes pass through concrete, masonry, or stud walls, or pass through ceilings, provide sleeve of the size required.

2.14 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PLUMBING SYSTEM LAYOUT

- A. Lay out the plumbing system in careful coordination with the Drawings, determining proper elevations for all components of the system and using only the minimum number of bends to produce a satisfactorily functioning system.
- B. Follow the general layout shown on the Drawings in all cases except where other work may interfere.
- C. Lay out pipes to fall within partition, wall, or roof cavities, and to not require furring other than as shown on the Drawings.

3.3 TRENCHING AND BACKFILLING

- A. Perform trenching and backfilling associated with the work of this Section
- B. Cut bottom of trenches to grade. Make trenches 12" wider than the greatest dimension of the pipe.
- C. Bedding and backfilling:
1. Install piping promptly after trenching. Keep trenches open as short a time as practicable.

2. Under the building, install pipes on a 6" bed of damp sand. Backfill to bottom of slab with damp sand.
3. Outside the building, install underground piping on a 6" bed of damp sand. Backfill to within 12" of finish grade with damp sand. Backfill remainder with native soil.
4. Do not backfill until installation has been approved and until Project Record Documents have been properly annotated.

3.4 INSTALLATION OF PIPING AND EQUIPMENT, GENERAL

A. General:

1. Proceed as rapidly as the building construction will permit.
2. Thoroughly clean items before installation. Cap pipe openings to exclude dirt until fixtures are installed and final connections have been made.
3. Cut pipe accurately, and work into place without springing or forcing, properly clearing windows, doors, and other openings. Excessive cutting or other weakening of the building will not be permitted.
4. Show no tool marks or threads on exposed plated, polished, or enameled connections from fixtures. Tape all finished surfaces to prevent damage during construction.
5. Make changes in directions with fittings; make changes in main sizes with eccentric reducing fittings. Unless otherwise noted, install water supply and return piping with straight side of eccentric fittings at top of the pipe.
6. Run horizontal sanitary and storm drainage piping at a uniform grade of 1/4" per foot, unless otherwise noted. Run horizontal water piping with an adequate pitch upwards in direction of flow to allow complete drainage.
7. Provide sufficient swing joining, ball joining, expansion loops, and devices necessary for a flexible piping system, whether or not shown on the Drawings.
8. Support piping independently at pumps, coils, tanks, and similar locations, so that the equipment will not support weight of pipe.
9. Pipe the drains from pump glands, drip pans, relief valves, air vents, and similar locations, to spill over an open sight drain, floor drain, or other acceptable discharge point, and terminate with a plain end un-threaded pipe 6" above the drain.
10. Securely bolt all equipment, isolators, hangers, and similar items in place.
11. Support each item independently from other pipes. Do not use wire for hanging or strapping pipes.
12. Provide complete dielectric isolation between ferrous and non-ferrous metals.

B. Provide union and shut off valves suitably located to facilitate maintenance and removal of equipment and apparatus.

C. Equipment access:

1. Install piping, equipment, and accessories to permit access for maintenance. Relocate items as necessary to provide such access, and without additional cost to the Owner.
2. Provide access doors where valves, motors or equipment requiring access for maintenance are located in walls or chases or above ceilings. Coordinate location of access doors with other trades as required.

3.5 PIPE JOINTS

A. Copper tubing:

1. Cut square, remove burrs, and clean inside of female fitting to a bright finish.
 - a. Apply solder flux with brush to tubing.
 - b. Remove internal parts of solder-end valves prior to soldering.
2. Provide dielectric unions at points of connection of copper tubing to ferrous piping and equipment.
3. For joining copper tubing, use:
 - a. Water piping 3" and smaller: "lead free solder";
 - b. Water piping larger than 3": "Sil-fos" brazing;
 - c. Underground: "sil-fos" brazing.

B. Screwed piping:

1. Deburr cuts.
 - a. Do not ream exceeding internal diameter of the pipe.
 - b. Thread to requirements of ANSI B2.1.
2. Use Teflon tape on male thread prior to joining other services.

C. Leaky joints:

1. Remake with new material.
2. Remove leaking section and/or fitting as directed.
3. Do not use thread cement or sealant to tighten joint.

3.6 PIPE SUPPORTS

- A. For Installation Guidelines, see Section 220529 PIPE HANGERS AND SUPPORTS
- B. Provide seismic bracing as required per B-Line's OSHPD-approved Seismic Restraint Design Booklet.
- C. Provide hard insulation inserts at hangers and rollers. Protect insulation inserts with galvanized steel shields.

3.7 SLEEVES AND OPENINGS

- A. Provide sleeves for each pipe passing through walls, partitions, floors, roofs, and ceilings.
 1. Set pipe sleeves in place before concrete is placed.
 2. For un-insulated pipe, provide sleeves two pipe sizes larger than the pipe passing through, or provide a minimum of 1/2" clearance between inside and outside of the pipe.
 3. For insulated pipe, provide sleeves of adequate size to accommodate the full thickness of pipe covering, with clearance for packing and caulking.
- B. Caulk the space between sleeve and pipe or pipe covering, using a noncombustible, permanently plastic, waterproof, non-staining compound which leaves a smooth finished appearance, or pack with noncombustible asbestos cotton, rope, or fiberglass to within 1/2" of both wall faces, and provide the waterproof compound described above.
- C. Finish and escutcheons:

1. Smooth up rough edges around sleeves with plaster or spackling compound.
2. Provide 1" wide chrome or nickel plated escutcheons on all pipes exposed to view where passing through walls, floors, partitions, ceilings, and similar locations.
 - a. Size the escutcheons to fit pipe and covering.
 - b. Hold escutcheons in place with setscrew.

3.8 CLEANOUTS

- A. Secure the Architect's approval of locations for cleanouts in finished areas prior to installation.
- B. Provide cleanouts of same nominal size as the pipes they serve; except where cleanouts are required in pipes 4" and larger provide 4" cleanouts.
- C. Make cleanouts accessible. After pressure tests are made and approved, thoroughly graphite the cleanout threads.

3.9 VALVES

- A. Provide valves in water, air, and gas systems. Locate and arrange so as to give complete regulation of apparatus, equipment, and fixtures.
- B. Provide valves in at least the following locations:
 1. In branches and/or headers of water piping serving a group of fixtures.
 2. On both sides of apparatus and equipment.
 3. For shutoff of risers and branch mains.
 4. For flushing and sterilizing the system.
 5. Where shown on the Drawings.
- C. Locate valves for easy accessibility and maintenance.

3.10 WATER HAMMER ARRESTORS

- A. Provide water hammer arrestors on hot water lines and cold water lines.
 1. Install in upright position at all quick closing valves, solenoids, isolated plumbing fixtures, and supply headers at plumbing fixture groups.
 2. Locate and size as specified or as shown on the Drawings.
 3. Install water hammer arrestors behind access panels.

3.11 BACKFLOW PREVENTION

- A. Protect plumbing fixtures, faucets with hose connections, and other equipment having plumbing connection, against possible back-siphonage.
- B. Arrange for testing of backflow devices as required by the governmental agencies having jurisdiction.

3.12 DISINFECTION OF WATER SYSTEMS

- A. Disinfect hot and cold water systems.

1. Notify the Architect at least 48 hours prior to start of the disinfection process.
 2. Upon completion of disinfecting, secure and submit the Certificate of Performance required under Article 1.3 of this Section, stating system capacity, disinfectant used, time and rate of disinfectant applied, and resultant residuals in ppm at completion.
 3. Use disinfectant method noted in the California Plumbing Code.
- B. When disinfection operation is completed, and after final flushing, secure an analysis by a laboratory approved by the Architect, based on water samples from the system, showing test negative for coli-aerogene organisms. Provide a total plate count of less than 100 bacteria per cc, or equal to the control sample.
- C. If analysis results are not satisfactory, repeat the disinfection procedures and retest until specified standards are achieved.

3.13 OTHER TESTING AND ADJUSTING

- A. Provide personnel and equipment, and arrange for all required tests and inspections required by governmental agencies having jurisdiction.
- B. Where tests show materials or workmanship to be deficient, replace or repair as necessary, and repeat the tests until the specified standards are achieved.
- C. Adjust the system to optimum standards of operation.

END OF SECTION

SECTION 23 07 13
DUCT INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Internal duct lining is not allowed.
- B. 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, Type I, commercial, kitchen hood exhaust.
 - 6. Indoor, exposed, Type I, commercial, kitchen hood exhaust.
 - 7. Indoor, concealed oven and warewash exhaust.
 - 8. Indoor, exposed oven and warewash exhaust.
 - 9. Indoor, concealed exhaust between isolation damper and penetration of building exterior.
 - 10. Indoor, exposed exhaust between isolation damper and penetration of building exterior.
 - 11. Outdoor, concealed supply and return.
 - 12. Outdoor, exposed supply and return.

1.2 ACTION 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.

1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.4 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. Products shall not contain formaldehyde, asbestos, lead, mercury, or mercury compounds.
- B. 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.
- C. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- D. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- E. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Corp.; SoftTouch Duct Wrap.
 - b. Johns Manville; Microlite.
 - c. Knauf Insulation; Friendly Feel Duct Wrap.
 - d. Manson Insulation Inc.; Alley Wrap.
 - e. Owens Corning; SOFTR All-Service Duct Wrap.
 - f. Or Approved Equal.
- 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 without factory-applied jacket.
 1. P P Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, 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. Manson Insulation Inc.; AK Board.
 - f. Owens Corning; Fiberglas 700 Series.
 - g. Or Approved Equal.

2.2 FIRE-RATED INSULATION SYSTEMS

- A. Fire-Rated Blanket: High-temperature, flexible, blanket insulation with FSK jacket that is tested and certified to provide a 1-hour fire rating by an NRTL acceptable to authorities

having jurisdiction.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Corp.; FlameChek.
 - b. Johns Manville; Firetemp Wrap.
 - c. Nelson Fire Stop Products; Nelson FSB Flameshield Blanket.
 - d. Thermal Ceramics; FireMaster Duct Wrap.
 - e. 3M; Fire Barrier Wrap Products.
 - f. Unifrax Corporation; FyreWrap.
 - g. Or approved equal.

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.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, 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.
 - e. Or approved equal.
 2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. Adhesive 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. 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, available products that may be incorporated into the Work include, but are not limited to, 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.
 - e. Or approved equal.
 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when

calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3. Adhesive 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."

D. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dow Corning Corporation; 739, Dow Silicone.
 - b. Johns Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
 - c. P.I.C. Plastics, Inc.; Welding Adhesive.
 - d. Speedline Corporation; Polyco VP Adhesive.
 - e. Or approved equal.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive 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."

2.4 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, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-80/30-90.
 - b. Vimasco Corporation; 749.
 - c. Or approved equal.
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, available products that may be incorporated into the Work include, but are not limited to, 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.
 - f. Or approved equal.
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.

2.5 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, 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.
 - e. Or approved equal.
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. Sealants 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."

B. ASJ Flashing Sealants, and Vinyl and PVC Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
 - b. Or approved equal.
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, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants 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."

2.6 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.
 5. Vinyl Jacket: White vinyl with a permeance of 1.3 perms when tested according to ASTM E 96/E 96M, Procedure A, and complying with NFPA 90A and NFPA 90B.

2.7 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, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Mast-A-Fab.
 - b. Vimasco Corporation; Elastafab 894.
 - c. Or approved equal.

2.8 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, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Johns Manville; Zeston.
 - b. P.I.C. Plastics, Inc.; FG Series.
 - c. Proto Corporation; LoSmoke.
 - d. Speedline Corporation; SmokeSafe.

- e. Or approved equal.
- 2. Adhesive: As recommended by jacket material manufacturer.
- 3. Color: White.
- A. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
 - 4. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, 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.
 - d. Or approved equal.
 - 5. Finish and thickness are indicated in field-applied jacket schedules.
 - 6. Moisture Barrier
 - 7. Self-Adhesive Outdoor 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 white aluminum-foil facing.
 - 8. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Polyguard Products, Inc.; Alumaguard 60.
 - b. Or approved equal.

2.9 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, available products that may be incorporated into the Work include, but are not limited to, 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.
 - e. Or approved equal.
 - 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, available products that may be

- incorporated into the Work include, but are not limited to, 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.
 - e. Or approved equal.
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, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ABI, Ideal Tape Division; 370 White PVC tape.
 - b. Compac Corporation; 130.
 - c. Venture Tape; 1506 CW NS.
 - d. Or approved equal.
 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, available products that may be incorporated into the Work include, but are not limited to, 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.
 - e. Or approved equal.
 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.

2.10 SECUREMENTS

- A. Aluminum Bands: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ITW Insulation Systems; Gerrard Strapping and Seals.
 - b. RPR Products, Inc.; Insul-Mate Strapping, Seals, and Springs.
 - c. Or approved equal.
- 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, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) AGM Industries, Inc.; Tactoo Perforated Base Insul-Hangers.
 - 2) GEMCO; Perforated Base.
 - 3) Midwest Fasteners, Inc.; Spindle.
 - 4) Or approved equal.
 - b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - c. Spindle: Copper- or zinc-coated, low-carbon 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, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) GEMCO; Nylon Hangers.
 - 2) Midwest Fasteners, Inc.; Nylon Insulation Hangers.
 - 3) Or approved equal.
 - 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, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) AGM Industries, Inc.; Tactoo Self-Adhering Insul-Hangers.
 - 2) GEMCO; Peel & Press.
 - 3) Midwest Fasteners, Inc.; Self Stick.
 - 4) Or approved equal.
 - b. Baseplate: Galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - c. Spindle: Copper- or zinc-coated, low-carbon 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 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, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) AGM Industries, Inc.; RC-150.
 - 2) GEMCO; R-150.
 - 3) Midwest Fasteners, Inc.; WA-150.
 - 4) Nelson Stud Welding; Speed Clips.
 - 5) Or approved equal.
 - 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, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) GEMCO.
 - 2) Midwest Fasteners, Inc.
 - 3) Or approved equal.
- C. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

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.
- B. 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.

3.3 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 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.
- 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 Section 078413 "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 Section 078413 "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.
 2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
 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, 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.
 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. 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.
 6. 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.
 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.

- B. 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.
 2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
 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. 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.
 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.

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 PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications, install with longitudinal seams along top and bottom of tanks and vessels. 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.
- C. 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.

3.6 FIRE-RATED INSULATION SYSTEM INSTALLATION

- A. Where fire-rated insulation system is indicated, secure system to ducts and duct hangers and supports to maintain a continuous fire rating.
- B. Insulate duct access panels and doors to achieve same fire rating as duct.
- C. Install firestopping at penetrations through fire-rated assemblies. Fire-stop systems are specified in Section 078413 "Penetration Firestopping."

3.7 FINISHES

- A. Insulation with ASJ or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
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.

3.8 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 one location(s) 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.

3.9 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:

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, Type I, commercial, kitchen hood exhaust.
6. Indoor, exposed, Type I, commercial, kitchen hood exhaust.
7. Indoor, concealed oven and warewash exhaust.
8. Indoor, exposed oven and warewash exhaust.
9. Indoor, concealed exhaust between isolation damper and penetration of building exterior.
10. Indoor, exposed exhaust between isolation damper and penetration of building exterior.
11. Outdoor, concealed supply and return.
12. Outdoor, exposed supply and return.

B. Items Not Insulated:

1. Fibrous-glass ducts.
2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
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.

3.10 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. Concealed, Supply-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- B. Concealed, Return-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements density.
- C. Concealed, Outdoor-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- D. Concealed, Exhaust-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- E. Concealed, Type I, Commercial, Kitchen Hood Exhaust Duct and Plenum Insulation: Fire-rated blanket; thickness as required to achieve 2-hour fire rating.
- F. Exposed, Supply-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.

- G. Exposed, Return-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- H. Exposed, Outdoor-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- I. Exposed, Exhaust-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- J. Exposed, Type I, Commercial, Kitchen Hood Exhaust Duct and Plenum Insulation: Fire-rated blanket; thickness as required to achieve 2-hour fire rating.

3.11 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, Supply-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- C. Concealed, Return-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- D. Concealed, Outdoor-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- E. Exposed, Supply-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.
- F. Exposed, Return-Air Duct and Plenum Insulation: Mineral-fiber blanket per CMC 605.0 & Title 24 requirements.

3.12 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:
 - 1. None.
- D. Ducts and Plenums, Exposed (in semi- or non-conditioned spaces):
 - 1. None.
 - 2. PVC: 20 mils thick.

3.13 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. Ducts and Plenums, Concealed:
 - 1. None.

2. PVC: 20 mils thick.
 3. Aluminum, Smooth: 0.016 inch thick.
- D. Ducts and Plenums, Exposed, up to 48 Inches in Diameter or with Flat Surfaces up to 72 Inches:
1. Aluminum, Smooth: 0.016 inch thick.
- E. Ducts and Plenums, Exposed, Larger Than 48 Inches in Diameter or with Flat Surfaces Larger Than 72 Inches:
1. Painted Aluminum, Smooth with 4-by-1-Inch Box Ribs: 0.040 inch thick.

END OF SECTION

SECTION 23 08 00

HVAC

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to work of this section.
- B. The requirements of the General Conditions and Division 1 apply to all work hereunder, also applicable provisions of SECTION 220500, Basic Mechanical Materials & Methods.

1.2 DESCRIPTION OF WORK

- A. Work of this section includes, but is not necessarily limited to heating, Ventilating and Air Conditioning work indicated on the drawings and described herein; also any incidental work not shown or specified that is necessary to provide the complete system.

1.3 COORDINATED LAYOUTS

- A. Coordinated layouts are required to amplify, expand and coordinate the information contained in the Contract Documents.
- B. Provide minimum 1/4" equals one foot scaled coordination drawings showing plan and pertinent section or elevation views of all piping, ductwork and electrical systems. Drawings shall be reproducible and/or electronic format, and the work represented shall be fully coordinated with the structure, other disciplines, and with all finishes. Drawings shall all be presented on a single size sheet. Contractor may use either size Arch D (24"x36") or Arch E1 (30"x42"). Drawing graphics shall fully comply with AIA Graphic Standards and ANSI Y14. Drawings may be hand-drawn or computer generated using AutoCAD. All drawings shall have title block, key plan, north arrow and sufficient grid lines to provide cross-reference to the design drawings.
 - 1. Provide a stamp or title block on each drawing with locations for signatures from all contractors involved, including but not limited to the General, HVAC, Plumbing, Fire Protection, and Electrical contractors. Include statement for signature that the contractor has reviewed the coordination drawings in detail and has coordinated the work of his trade.
 - 2. Show on drawings the intended elevation of all ductwork in accordance with the following example:
B.O.D. = 9'-0"
OFFSET UP 6"
B.O.D. = 9'-6"
 - 3. Highlight, encircle or otherwise indicate deviations from the Contract Documents on the coordinated layouts. Architect will not be responsible for "finding" changes or deviations to the original Contract Documents.
- C. Since scale of contract drawings is small and all offsets and fittings are not shown, contractor shall make allowances in bid for additional coordination time, detailing, fittings, offsets, hangers and the like to achieve a fully coordinated installation. If changes in duct size are required, equivalent area shall be maintained and the aspect ratio shall not be in

excess of 2 to 1 unless approved by the engineer. Drawings shall be submitted for review prior to fabrication and installation. Drawings may be submitted in packages representing at least $\frac{1}{4}$ of the building ductwork.

- D. Check routing on all ductwork before fabricating. Report any discrepancies to Architect. No extra cost will be allowed for failure to conform to above.
- E. It shall be the responsibility of the General Contractor to insure that the Heating, Ventilating and Air Conditioning Contractor coordinates all of his work with all other trades, including mechanical and electrical trades, so that the complete job is neat and in conformity with plans and specifications.

1.4 REFERENCES

- A. AABC – Associated Air Balance Council
- B. AFBMA – Anti Friction Bearing Manufacturer’s Association
- C. AGA – American Gas Association
- D. AMCA – Air Moving and Control Association, Inc.
- E. Standard 210 – Laboratory Methods of Testing Fans
- F. ANSI – American National Standards Institute
- G. ARI – Air Conditioning and Refrigeration Institute
- H. ASHRAE – American Society of Heating, Refrigerating and Air Conditioning Engineers
- I. ASME – American Society of Mechanical Engineers
- J. ASTM – American Society of Testing and Materials
- K. CCR – California Code of Regulations.
- L. CSFM – California State Fire Marshal
- M. NIST – National Institute of Standards and Technology
- N. NEMA – National Electrical Manufacturer’s Association
- O. NFPA – National Fire Protection Association
- P. OSHA – Occupational Safety and Health Act
- Q. SMACNA – Duct Manuals
- R. CBC – California Building Code
- S. UL – Underwriters’ Laboratories, Inc.
- T. CMC – California Mechanical Code
- U. CPC – California Plumbing Code

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, dimensions, weights, furnished specialties and accessories; and installation and start-up instructions
- B. Engineering Data: Submit fan curves and sound power level data for each fan unit. Data shall be at the scheduled capacity. Data shall include the name of the rating agency or independent laboratory.
- C. Maintenance Data: Submit maintenance data and parts list for each piece of equipment, control, and accessory; including "trouble-shooting" maintenance guide.
 - 1. Include this data in maintenance manuals
- D. Record Drawings: At project closeout, submit Record Drawings of installed ductwork, duct accessories, and outlets and inlets in accordance with the requirements of Division 1.

1.6 QUALITY ASSURANCE

- A. Design Criteria:
 - 1. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture. All gas fired equipment shall be AGA listed
 - 2. Supply all equipment and accessories in accordance with requirements of all applicable national, state and local codes.
 - 3. All items of a given type shall be the products of the same manufacturer.
 - 4. Scheduled equipment performance is minimum capacity required.
 - 5. Scheduled electrical capacity shall be considered as maximum available.
 - 6. Scheduled gas BTU input shall be considered as the maximum available.

1.7 PLUMBING

- A. All plumbing work required in the course of this contract shall be performed in strict accordance with all codes and regulations. Plumbing work done under this contract shall not adversely affect the operation of the existing plumbing systems. All materials shall be new and shall match existing.

PART 2 PRODUCTS

2.1 HVAC EQUIPMENT

- A. Provide equipment, trim and accessories as specified in the schedules on the drawings.

2.2 DUCTWORK

- A. Design and installation standards. Comply with all applicable portions of the following codes for all work in this section:
 - 1. SMACNA
 - 2. ASHRAE recommendations, latest edition
 - 3. NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems, latest edition.
 - 4. NFPA 90B, Standard for the Installation Warm Air Heating and Air Conditioning Systems, latest edition.

5. CMC, 2016
 6. ADC Test Code FD 72-RI, Flexible Air Duct Test Code
- B. Fabricate all ductwork with sheet metal. Fiberglass ductwork will not be accepted for use on this project.
- C. Duct sizes indicated are internal sizes.
- D. Galvanized Sheet Steel: Lock-forming quality, ASTM A-525 and ASTM A-527, Coating Designation G 90. Provide mill phosphatized finish for exposed surfaces of ducts exposed to view.
- E. Seal airtight all standing seams and all joints of all supply, return and exhaust ducts except those exposed in the conditioned space covered with Hardcast DT tape 4" wide and Hardcast FTA-20 adhesive.
1. Pressure-sensitive tapes or single part sealant not acceptable.
- F. Seal airtight and watertight all joints of all ductwork exposed to the weather with 6 ounce canvas bonded with MEI Eco-Tack adhesive; cover the canvas with a heavy coat Foster's 56-10, or equal, no dilution.
1. Pressure-sensitive tapes or single part sealant not acceptable.
 2. Where seams are exposed to weather, paint seams with aluminum paint over sealant and tape. Provide cross-braced ductwork, and insure that the ductwork will shed water.
- G. Provide sheet metal angle frame at all duct penetrations to wall, floor, roof, or ceiling.
- H. Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim, and angles for support of ductwork.
- I. Rectangular Duct Fabrication
1. Shop fabricate ductwork of gauges and reinforcement complying with the more stringent of the following standards, except as noted herein:
 2. SMACNA HVAC Duct Construction Standards, 2016 CMC
 3. Fabricate ducts with minimum duct gauges as follows;
- | Duct dimension | Min Ga | Joint Reinforcement |
|----------------|--------|---------------------|
| Up through 12" | 26 | Not Required |
| 13" – 18" | 24 | Not Required |
| 19" – 30" | 24 | C/4 |
| 31" – 42" | 22 | E/4 |
| 43" – 54" | 22 | F/2 |
| 55" – 60" | 20 | G/4 |
| 61" – 84" | 20 | I/2 |
| 85" – 96" | 20 | J/2 |
| Over 96" | 18 | K/2 |
4. Fabricate duct fittings to match adjoining ducts and comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with centerline radius equal to 1.5 times associated duct width. Fabricate to include single-thickness turning-vanes with trailing edge in elbows where space does not permit the above radius or where square elbows are shown. Limit angular tapers to 30 degrees for contracting

tapers and 20 degrees for expanding tapers.

5. Fabricate round supply connections at rectangular, plenum type fittings using spin-in type fittings, complete with extractor and volume control dampers. Refer to Division -15 Section "Duct Accessories" for damper requirements.
6. Provide drive slip or equivalent flat seams for ducts exposed in the conditioned space or where necessary due to space limitations. On ducts with flat seams, provide standard reinforcing on inside of duct. Duct connection to outlet on exposed duct shall be full size of outer perimeter of outlet flange.
7. Provide 20 Ga. minimum for ductwork exposed within occupied spaces.

J. Miscellaneous Ductwork Materials

1. Fittings: Unless otherwise shown on the Drawings, following fittings shall be used: Two-piece, die-stamped, 45-degree to 90-degree elbows for sizes up to 12"; five-piece, 90-degree elbows for sizes 12" and above; conical tees; and conical laterals. All reducers shall be placed after a tap has been made on the duct main. Reducers shall be long-taper style.
2. Duct Sealant: Non-hardening, non-migrating mastic or liquid elastic sealant as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork.
3. Duct joints: Joint and seal prefabricated, factory-built ducts, fittings and couplings in strict accordance with duct manufacturer's instructions. Install duct-sealers, pop rivets or sheet metal screws and glass fabric and mastic on each joint. Duct sealer shall be fire retardant. Sheet metal screw for joints shall be minimum #10 size galvanized.
4. Duct Access: Provide hinged access door in prefabricated, factory-build ducts for access to fire dampers, control equipment, etc. as specified in Duct Accessories Section. Access door size shall be duct diameter wide by duct diameter high for all ducts under 24". Ducts over 24" in diameter shall have 24" by 18" access doors. Minimum size access doors shall be 6" by 6".
5. Provide hinged style access doors for round ductwork, National Controlled Air, Inc. AD-RD-87, Pottorff Series 60, or equal. Access doors shall be 16 Ga. galvanized steel with continuous piano hinge. Locks shall be plated steel strike and catch. Provide 1"x3/8" Polyethylene "Perma Stik" gasket all around door.

K. Flexible Ducts

1. Flexible ducts shall consist of an exterior reinforced laminated vapor barrier, 1-1/2" thick fiberglass insulation ($K=.25 @ 75$ degrees F), encapsulated spring steel wire Helix and impervious, smooth, non-perforated interior vinyl liner. Individual lengths of flexible ducts shall contain factory fabricated steel connection collars.
2. Factory made air ducts shall be approved for the use intended or shall conform to requirements of UMC Standard 6 and 6-5. Each portion of a factory-made air duct system shall be identified by the manufacturer with a label or other suitable identification indicating compliance with UMC Standard 6-1 and its class designation. These ducts shall be UL listed Class 1, 25/50 smoke and flame spread and shall be installed in accordance with the terms of their listing. Omit external insulation.
 - a. Flexible ductwork shall be maximum of 5 feet long, and shall be extended to the fullest possible length, in order to minimize pressure drop in the duct.
 - b. Ducts shall be UL approved and tested to meet Class requirements of NFPA 90A and comply with UMC Standard 6-1. Make bends to maintain $R/D=1.5$.

3. Make connections to rigid duct and units with Panduit style draw band at inner liner material, then at outer vapor barrier material; and then provide duct tape over outside of sheath.
4. Subject to compliance with requirements, manufacturers offering Flexible Ducts which may be incorporated in the work include the following:
 - a. Thermaflex M-KC
 - b. Flexmaster USA, Inc.
- L. Provide Ventlon flexible connections on inlet and outlet of AC unit, air handler and exhaust fans. Provide galvanized weather hood over flexible connections exposed to the weather.

PART 3 EXECUTION

3.1 EQUIPMENT START-UP

- A. Initial start-up of supply, exhaust and return fan systems and pumps shall be under the direct supervision of the Testing and Balancing Contractor.
- B. Equipment start-up shall not be performed until the piping systems have been flushed and treated in the initial water flow balance has been completed.
- C. It shall be the responsibility of the Contractor to assemble and supervise a start-up team consisting of Controls, Equipment Manufacturer start-up technician, and Test and Balance contractor; all to work in concert to assure that all systems are started, balanced and operate in accordance with the design.
- D. After start-up is complete, instruct the Owner's personnel in the operation and maintenance of the systems. Obtain from the Owner's representative a signed memo certifying that the instructions have been received.

3.2 EXPANSION JOINTS

- A. Furnish and install expansion loops or joints in the steam or water lines as required with anchors and guides as required for the proper operation of the expansion loops or joints.

3.3 ANTI-VIBRATION BASES AND HANGERS

- A. Isolate all ventilating and air conditioning equipment connections including conduit, piping, drains, etc., so that equipment will operate under continuous demand without objectionable vibration.
- B. Equipment shall be supported on anti-vibration bases, pads, or hangers, as shown on the drawings or specified with the equipment. Individual fans shall have integral, spring-type fan and motor bases unless otherwise noted.
- C. Selection of the bases or supporting units shall be in accordance with the vibration eliminator manufacturer's recommendations. Minimum static deflection shall be 1-1/2" or as marked on the Drawings.
- D. The equipment manufacturer shall furnish the weight of equipment at each point of support.

3.4 INSTALLATION OF DUCTWORK

- A. Assemble and install ductwork in accordance with recognized industry practices which will achieve air tight and noiseless (no objectionable noise) systems capable of performing each indicated service. Install each run with minimum of joints. Align ductwork accurately at connections within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers, and anchors of type that will hold ducts true to shape and to prevent buckling. Where possible, install ductwork to clear construction by 1/4" minimum, except at air inlets and outlets. Where ductwork will not clear construction, secure duct firmly to eliminate noise in the system.

B. Applicable Leakage Classes:

Pressure Class	Leakage Class Round Duct	Leakage Class Rectangular Duct
2" WG or less	12	12
4" WG or greater	3	6

- C. Install concrete inserts for support of ductwork in coordination with formwork as required to avoid delays in work.

- D. Where ducts pass through interior partitions and exterior walls, conceal space between construction opening and duct or duct plus insulation with sheet metal flanges of same gauge as duct. Overlap opening on four sides by at least 1 1/2".

- E. Support ductwork in manner complying with SMACNA "HVAC Duct Construction Standards", latest edition, hangers and supports sections. Where special hanging of ductwork is detailed or shown on Drawings, Drawings shall be followed. Angles shall be attached to overhead construction in a manner so as to allow a minimum of 2" of movement in all directions with no bending or sagging of the angle.

1. Except where modified in individual paragraphs of this Section, provide hanger support in accordance with the following:

RECTANGULAR DUCT HANGER SUPPORT REQUIREMENTS

SEMI-PERIMETER	PAIR @ 8 FT.	PAIR @ 5 FT.
To 30"	1"x22 Ga.	1"x22 Ga.
31" to 72"	1"x20 Ga.	1"x22 Ga.
73" to 96"	1"x18 Ga.	1"x22 Ga.

2. Install duct supports to rectangular ducts with sheet metal screws. Provide one screw at top of duct and one screw at bottom of duct.

F. Installation of Flexible Ductwork:

1. Provide flexible ducts with supports at 30" centers with 2" wide, 26 Ga. steel hanger collar attached to the structure with an approved duct hanger. Installation shall minimize sharp radius turns or offsets.
 - a. Supports shall be in accordance with UMC Standard 6-5
2. Make connection to duct with spin-in fittings, with air scoop and balance damper.

- G. Paint inside of ducts, visible through grille, flat black.

- H. Where ductwork is installed in finished areas of buildings that do not have ceilings, paint ductwork, support hangers, and air inlets and outlets to match adjacent architectural surfaces.

3.5 CLEANING AND PROTECTION

- A. Clean ductwork internally, unit by unit as it is installed, of dust and debris. Clean external surfaces of foreign substances that may cause corrosive deterioration of metal or where ductwork is to be painted.
- B. Strip protective paper from stainless ductwork surfaces, and repair finish wherever it has been damaged.
- C. Temporary Closure: At ends of ducts that are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering that will prevent entrance of dust and debris until connections are to be completed.

3.6 DAMPERS

- A. All dampers automatically controlled by dampers motors are specified under "Temperature Control System" except those specified with items of equipment.
- B. Provide opposed blade manual air dampers at each branch duct connection and at locations indicated on the Drawings and where necessary to control airflow for balancing system. Provide an opposed-blade balancing-damper in each zone supply duct. Provide an access panel or Ventlok flush-type damper regulator on ceiling or wall for each concealed damper.
- C. Install fusible link fire dampers full size of duct at points where shown or required.
- D. Provide 18"x12" minimum hinged access doors in ductwork and furring for easy access to each fire damper; insulated access doors in insulated ducts. Label access doors with ½" high red letters.
 - 1. Provide Ventlok access doors with Series 100 hardware for convenient access to all automatic dampers and other components of the system, insulated type in insulated ducts. Provide Ventlok #202 for light duty up to 2" thick doors. Provide #260 hinges on all hinged and personnel access doors and include gasketing.

3.7 AIR INLETS AND OUTLETS

- A. Provide all air inlets and outlets with gaskets and install so that there will be no streaking of the walls or ceilings due to leakage. Duct connection to outlet on exposed duct shall be full size of outer perimeter of outlet flange.
- B. Ceiling mounted air terminals or services installed in T-bar type ceiling systems shall be positively attached to the ceiling suspension main runners or to cross runners with the same carrying capacity as the main runners.
 - 1. Terminals or services weighing not more than 56 pounds shall have two #12 Ga. hangers connected from the terminal or service to the structure above. These wires may be slack.
 - 2. Terminals or services weighing more than 56 pounds shall be supported directly from the structure above by approved hangers. Provide 4 taut 12 Ga. wires each, attached to the fixture and to the structure above. The 4 taut 12 Ga. wires, including their attachment

to the structure above must be capable of supporting 4 times the weight of the unit.

3. Secure air inlets and outlets to main runners of ceiling suspension system with 2 sheet metal screws.

- C. Furnish all air inlets and outlets with baked prime coat unless otherwise noted. Provide off-white baked enamel finish on ceiling-mounted air inlets and outlets. Exposed mounting screws shall be painted to match the material being secured.
- D. Air inlets and outlets shall match all qualities of these specified including appearance, throw, noise level, adjustability, etc.

3.8 FANS

- A. Provide access doors for fans or motors mounted in ductwork.
- B. Mount all fans so that they are completely isolated from building.
- C. Fan motors mounted in air-stream to be totally enclosed.
- D. Completely line supply, return or exhaust fan cabinets with 1" thick, ¾ pound density acoustic insulation securely cemented in place.
- E. Roof fans shall be mounted level.

3.9 EQUIPMENT CHECK, TEST AND START

- A. A specialized company, acting as a subcontractor to the air conditioning contractor shall perform the check, test and start of each air-handling unit. The company selected shall have had experience on similar projects and shall have demonstrated by past performance that the personnel are qualified to do such work. The firm selected shall have approval of the Architect prior to start of work.
- B. Provide all personnel, test instruments, and equipment to properly perform the check, test and start.
- C. The check, test and start of each item of equipment shall be in accordance with manufacturer's printed instructions. Three copies of the completed check, test and start report of each item of equipment shall be bound with the operating and maintenance instructions. Include a full test of all economizer operations as part of the equipment check. Confirm that wiring and motor operation is correct.
- D. Upon completion of work, provide a schedule of planned maintenance indicating frequency of service for all equipment components. Post schedule where directed under plastic.

3.10 TESTING AND BALANCING

- A. Contractor shall provide for adjustments and/or additions or modifications to fan and motor sheaves, belts, damper linkages and the like to achieve proper air balance at no additional cost.
- B. Testing and balancing shall be performed in complete accordance with AABC National Standards for Field Measurements and Instrumentation, Volume Four. Testing and balancing shall be performed on air distribution systems, chilled water system, heating water system, and domestic water system.

- C. Balance air quantities of supply, return, outside air, and exhaust to achieve those given on Drawings with accuracy within minus 5 percent and plus 10 percent. Ensure that dampers remain full open during economizer cycle, and full closed at all other times. Test each system for building operating pressure, under all operating conditions, including all phases of the economy cycle. Maximum building pressure shall not exceed +0.04 " WC.
- D. Instruments used for testing and balancing of systems shall have been calibrated within a period of six months and shall be checked for accuracy prior to start of work.
- E. Adjust single or double deflection registers and variable pattern diffusers to evenly distribute air within the conditioned space. The terminal air velocity at 5 foot above the floor shall not exceed 50 FPM in normal air-conditioned spaces.

3.11 EQUIPMENT MOUNTING

- A. Mounting and anchorage of equipment shall be in strict compliance with drawing details. Alternate anchorage methods will not be considered for roof mounted equipment.

3.12 OPERATOR TRAINING

- A. On-site training services shall be made available to the facility maintenance and operation staff. The contractor's designated personnel shall present all O&M manuals for newly installed equipment and controls components, and demonstration shall be provided for, but not be limited to, the following:
 - 1. Control system login, set point manipulation, monitoring & trend data observation.
 - 2. Access & provision for common equipment services and/or warranty requirements, such as fan belt replacement, filter changeout, lubrication, etc.

END OF SECTION

SECTION 23 31 13

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.

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.
 - 1. Seismic Hazard Level A: Seismic force to weight ratio, 0.48.
 - 2. Seismic Hazard Level B: Seismic force to weight ratio, 0.30.
 - 3. Seismic Hazard Level C: Seismic force to weight ratio, 0.15.
- 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.
5. Design Calculations: Calculations for selecting hangers and supports and seismic restraints.

D. Coordination Drawings: Plans, drawn to 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.

E. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.
- B. 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.

- C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."
- D. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

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, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Lindab Inc.
 - b. McGill AirFlow LLC.
 - c. SEMCO Incorporated.
 - d. Sheet Metal Connectors, Inc.
 - e. Spiral Manufacturing Co., Inc.
 - f. Or approved equal.
- 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: G60.

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: 3 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, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, 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.
 - 9. Or approved equal.

- B. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
 - 1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
- C. 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.
- D. Restraint Cables: ASTM A 603, galvanized-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.
- E. Hanger Rod Stiffener: Reinforcing steel angle clamped to hanger rod.
- F. 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.
- 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.

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." In no case should leakage exceed 10% of total system capacity.
- 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.
- G. Refer to plans for hanger details. Comply with this section or the plans, whichever is more stringent.

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 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. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction.

- F. 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.
- G. 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.
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.7 DUCT CLEANING

- A. Clean new duct system(s) before testing, adjusting, and balancing.
- B. Use service openings for entry and inspection.
 - 1. Create new openings and install access panels appropriate for duct static-pressure class if required for cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation and liner as recommended by duct liner manufacturer.
 - 2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection.
 - 3. Remove and reinstall ceiling to gain access during the cleaning process.
- C. Particulate Collection and Odor Control:
 - 1. When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.
 - 2. When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.
- D. Clean the following components by removing surface contaminants and deposits:
 - 1. Air outlets and inlets (registers, grilles, and diffusers).
 - 2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.

3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.
4. Coils and related components.
5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
6. Supply-air ducts, dampers, actuators, and turning vanes.
7. Dedicated exhaust and ventilation components and makeup air systems.

E. Mechanical Cleaning Methodology:

1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.
2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.
3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
4. Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.
5. Clean coils and coil drain pans according to NADCA 1992. Keep drain pan operational. Rinse coils with clean water to remove latent residues and cleaning materials; comb and straighten fins.
6. Provide drainage and cleanup for wash-down procedures.
7. Antimicrobial Agents and Coatings: Apply EPA-registered antimicrobial agents if fungus is present. Apply antimicrobial agents according to manufacturer's written instructions after removal of surface deposits and debris.

END OF SECTION

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL**PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. All basic instructions of the project including scope and project electrical requirements.

1.2 RELATED SECTIONS

- A. All of the Division 26 Sections relate.

1.3 QUALIFICATIONS

- A. Electrical Contractor shall be established with a minimum of 5 years in the area with a working knowledge of the California Electrical Code.
- B. All electrical equipment shall be of a manufacturer as specified or approved equal.

1.4 REFERENCES

- A. California Electrical Code 2016 Edition
- B. California Building Code 2016 Edition
- C. California Mechanical Code 2016 Edition
- D. California Fire Code 2013 Edition.

PART 2 SCOPE AND PROJECT ELECTRICAL REQUIREMENTS**2.1 PROVISIONS**

- A. The General Conditions, Supplemental Conditions and Division 01, General Requirements, are a part of this section and the Contract for this work and apply to this Section as fully as if repeated herein.

2.2 SCOPE

- A. Provide all labor, materials, tools, plant equipment, transportation and perform all operations necessary for and completion of all electrical work whether specifically mentioned or not; all as indicated, specified herein, and/or implied thereby to carry out the apparent intent thereof. Some of the items of work specified herein are as follows.
 - 1. Study work and related drawings and specifications of all other crafts whose work abuts, adjoins, or in any manner is affected by work of this Section. Consult with other trades and with them expedite and coordinate material and labor to avoid omissions and delays.
 - 2. Complete system of 208/120 volt, three phase, four wire, wiring distributions including all branch circuits and outlets for the lighting and convenience outlets, as shown on the drawings.
 - 3. Electrical Service.

4. Any electrical item that needs to be relocated temporarily in order to carry out the contract works shall be included in the bid.
5. All lighting fixtures furnished and installed complete with lamps.
6. Exit and Emergency Lighting.
7. Provide data and telephone system conduits and boxes, as shown on the plans and specified herein. All outlets, cover plates, cables and terminations for data system by owners vendor.
8. Framing and other associated work required for the installation of the electrical system.
9. Submission of shop drawings and submittals.
10. Excavation, backfill, framing and other associated work required for the installation of the electrical systems.
11. "As-Built" drawings.
12. Acceptance testing for all the different systems installed. Provide itemized list of tests carried out and recorded test results.
13. Prepare day-by-day record of "as built" changes as specified hereinafter.
14. Furnish, install and connect all line voltage conduit and wiring to mechanical equipment and other Owner furnished electrical equipment unless otherwise noted. Conduit and wiring for low voltage control wiring of the HVAC systems is under another section unless otherwise noted.
15. Furnish and install disconnect switches, as required for the mechanical equipment and controls as shown on electrical and mechanical drawings. Install all motor starters furnished loose by Mechanical Contractor.

2.3 WORK NOT INCLUDED:

The following work as outlined is not included in the Electrical Contract; however, this Contractor shall cooperate with the other contractors involved and shall be responsible to give complete directions on sizes of openings, locations, etc., and to insure that the completed electrical installation shall be of good workmanship and in accordance with drawings and specifications.

- A. Telephone and Data processing system head end equipment and rack.

2.4 QUALITY ASSURANCE:

- A. **QUALIFICATIONS OF INSTALLERS:** For the actual fabrication, installation and testing of the electrical work, use only personnel who are thoroughly trained and experienced in the skills required and who are completely familiar with the manufacturers recommend methods of installation, the equipment to be utilized, and the requirements of this work.
- B. **PERMITS AND ORDINANCES:** Comply with all codes, ordinances, and authorities having jurisdiction, including all local ordinances, the State of California Title 24, the California Electrical Code, and the California Building Code. Electrical Contractor shall procure and pay for all permits, licenses, etc. required to carry on and complete the work. Additionally:
1. Comply with pertinent requirements of Underwriters' Laboratories, incorporated for all items installed for which UL standards have been established.

2.5 REVIEW SUBMITTALS:

- A. For ease of maintenance and parts replacement, to the maximum extent possible use equipment of a single manufacturer. The Architect reserves the right to reject any Materials List which contains equipment from various manufacturers if suitable materials can be secured from fewer manufacturers and to require that the source of materials be unified to the maximum extent possible.
- B. When specific names are used in connection with materials, they are used as standards only, but this implies no right upon the part of the Contractor to use other materials or methods unless approved as equal in quality and utility by the Architect in writing and in accordance with provisions for substitutions previously stipulated in these specifications.
- C. Shop drawings and all supporting data shall be submitted as instruments of the Contractor. Contractor shall place his stamp on the cover sheet of submittal documents, thereby stating that the equipment meets all requirements of the conditions. At least one set of submittals shall have check marks at each item indicating that the Contractor has verified compliance with the above requirements.
- D. Should the original submittal of a proposed substitution be rejected, the specified item shall be furnished.
- E. Within twenty-one (21) days after award of contract, submit (7) bound copies of brochures containing complete information and catalog cuts on all equipment including, that which is to be furnished as specified. Include wiring diagrams where so required. The brochures shall be bound separately according to classifications of equipment such as power, lighting, emergency generator, signal systems and miscellaneous systems. Proposed substitutions shall be accompanied by catalog cuts, ratings, sizes, performance curves, shop drawings and other data complete to prove full equality to the specified item. At least one copy of the submittals for each system shall be made up of original printed manufacturer's cut sheets. Additional copies may be made up of Xerox copies. FAX submittals and electronically transmitted submittals are not acceptable and will be returned unreviewed.
- F. Approval of a substitution does not authorize any deviation from the utility, size or function of the specified item unless specifically pointed out and approval requested in the letter of submittals. Responsibility for conflicts due to space limitations are not relieved by approval of a substitution. If revision of wiring, piping or arrangement of other equipment is necessary, after approval, furnish the Architect with (7) copies for file and future reference.
- G. Panelboard submittals shall be arranged to show bussing circuit numbers with respective branch circuit devices similar to schedules on drawings. Switchboard and motor control center submittals shall show elevations indicating layout of devices, metering, etc. Device ratings, circuit numbers and nameplates shall be in table form. Terminal cabinet submittals shall include elevations with terminal strip mounting arrangement.
- H. Unless otherwise shown or specified, material shall be new, full weight, standard, the best quality of its' kind and satisfactory to the Architect. Materials shall be stored and protected as necessary and/or required by the Architect, and the Contractor shall be entirely

responsible for damage or loss from any cause. Unless otherwise shown or specified, major equipment shall be the product of a manufacturer who has for a period of not less than five (5) years, been in successful manufacture of the equipment and who has nationally distributed catalog covering ratings and specifications of said equipment.

- I. Electrical materials and equipment shall bear the label of, or be listed by, the Underwriters' Laboratories unless of a type for which label or listing service is not provided.
- J. Materials and components shall conform to industrial standards including:
 - N.E.M.A. - National Electrical Manufacturers' Association
 - A.S.A. - American Standards Association
 - A.S.T.M. - American Society of Testing Materials
 - I.P.C.E.A. - Insulated Power Cable Engineers' Association
 - C.B.M. - Certified Ballast Manufacturers
- K. Samples of fixtures, materials and equipment shall be submitted for approval of Architect if requested.
- L. As a minimum, submittals shall be provided for the following items/systems:
 - 1. Basic Electrical Materials.
 - 2. Light fixtures and controls.
 - 3. Panelboards.
 - 4. Main service switchboard.

2.6 PRODUCT HANDLING:

- A. Delivery and Storage: Deliver material in time to insure uninterrupted progress of the work. Materials shall be stored in a manner to preclude damage and permit ready access for inspection and identification of each shipment. Materials shall be kept free from dirt, grease and other foreign matter, and shall be protected from corrosion. Materials showing evidence of damage will be rejected and shall be immediately removed from the work.
- B. Protection: Use all means necessary to protect the electrical work and fixtures before, during, and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage to either the work or materials hereunder or the work and/or materials of other trades, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional expense to the Owner.

2.7 JOB CONDITIONS:

- A. Examination of Site: Contractor shall be held to have visited the site and satisfied himself as to the conditions under which the work is to be performed. Contractor shall check all existing conditions which may affect the work under this Section. No allowances will subsequently be made on behalf of the Contractor for any extra expense to which

Contractor may be put due to any failure or neglect relative to the discovery of conditions affecting the work under this Section.

- B. Specification and Contract Drawings: Accuracy of data given herein and on the drawings are as exact as could be secured, but their extreme accuracy is not guaranteed. The drawings and specifications are for the assistance and guidance of the Contractor and exact locations, distances, levels, etc., will be governed by the building and the Contractor shall accept same with this understanding.
1. Drawings and specifications may be superseded by later detail specifications and detail drawings prepared by the Architect, and the Contract shall conform to them and to such reasonable changes in the Contract Drawings as may be called for by those revised drawings without extra cost to the Owner. Where work called for exceeds code requirements, drawings and specifications shall take precedence.
 2. Layouts of equipment, accessories and wiring systems are diagrammatic (not pictorial), but shall be followed as closely as possible. Architectural, structural and other mechanical drawings shall be examined, noting all conditions that may affect this work. Report conflicting conditions to the Architect for adjustment before proceeding with work.
 3. Should Contractor proceed with work without so reporting matter, he does so on his own responsibility, and shall alter work if directed by the Architect, at his own expense. Right is reserved to make minor changes in locations of equipment and wiring systems shown, providing change is ordered before conduit runs and/or work directly connected to same is installed and no extra materials are required.
- C. Relocation by Owner: The Owner reserves the right to make minor changes in locations of equipment, lighting, outlets, switches, telephone outlets, and any other component of the electrical work under this Section, providing such change is ordered before conduit runs and/or work directly connected to same is installed and no extra materials are required, all at no extra cost to the Owner.
- D. Working Space: Adequate working space shall be provided around electrical equipment in strict compliance with the Electrical Safety Orders. In general provide six and one half feet (6' - 6") of headroom and thirty-six inches (36") minimum clear work space in front of panelboards and controls for 120 volts and forty-two inches (42") 480 volts. Particular attention shall be paid to CEC Article 110-26 and 408.
- E. Equipment Identification: Nameplates shall be installed on electrical equipment. Equipment to be so labeled shall include the following:
1. Individual enclosures such as disconnect switches, time switches, push buttons, contactors, relays, motor starters, etc.
 2. Group mounted equipment such as panelboards and switchboard.
 3. Individual circuit breakers on switchboards.
 4. Wall switches for lighting or other use where the control function is not self-evident.
 5. Each panel shall be labeled to provide the following information minimum:
 - (a) Panel name.
 - (b) Size of feeder feeding the panel.

- (c) Rated voltage, amps and phases.

6. Each distribution panel shall be labeled to provide the following information minimum:

- (a) Rated voltage, amps and phases.
- (b) Main switch rating.
- (c) Feeder circuit breaker rating with name of panel or equipment fed and size of feeder to this equipment.

7. Nameplates shall adequately describe the item and its' function or use of the particular equipment involved.

Nameplate material shall be laminated phenolic plastic. Black front and back with white core for normal power circuits, panels, etc. Engraving shall be through the outer layer. Embossed plastic pressure sensitive labels are not acceptable. In lieu of plastic plates, device plates shall be engraved directly with lettering filled with black enamel.

- (a) Install engraved nameplates for each new panelboard, cabinet, disconnect, etc. Nameplates shall be securely fastened to the equipment with #4 phillips round head cadmium plated self-tapping screws, brass bolt.
- (b) Label all switches and power receptacles as to the circuit number and panelboard that feeds them, normal and emergency. Such label shall be self adhesive white tape with black (normal power) or red (emergency power) letters made on a label maker.

F. Electrical Work for Motors and Appliances Furnished by Others:

1. Work is shown on drawings according to best information available at time drawings was prepared; but this Contractor shall obtain accurate information on equipment power requirements and connection points from Contractors furnishing the actual equipment and shall install electrical work to suit at no extra cost to Owner. Should Contractor proceed with work without first verifying accuracy of the plans, he does so on his own risk and shall alter work if required at his own expense.
2. Mechanical, Plumbing, and Fire Sprinkler Contractors shall furnish written or printed specifications, dimension sheets and wiring diagrams for the electrical work applying to the actual equipment being installed. Electrical Contractor shall be responsible for obtaining these and shall assist other Contractors in testing of their systems, but his responsibility is restricted to having correctly installed and connected electrical work in accordance with diagrams and specifications furnished him by the other Contractors.

G. OPERATIONS AND MAINTENANCE MANUALS: Provide "As-Built" drawings for each system as part of the O & M Manuel. Provide O & M Manuel for panels, light fixtures and lighting controls. Each binder shall be a 3 ring binder and have project name, contractor's name, address, telephone and system description. Provide one binder for power/lighting systems. Do not combine these binders with any other disciplines on this project.

PART 3 EXECUTION

3.1 PREPARATION

- A. REVIEW OF DEVELOPED CONDITIONS: Prior to the installation of any electrical system, under this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where the work hereunder can properly commence.

Verify that all electrical work can be performed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.

- B. DISCREPANCIES: In the event of discrepancies, immediately notify the Architect. Do not proceed with the installation of work hereunder in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 EXECUTION

- A. NAMEPLATES: Install engraved nameplates for each electrical device, disconnect control station, etc. Designation shall be as directed by the Engineer. Nameplates shall be securely fastened to the equipment with #4 Phillips round head cadmium plated self-tapping screws.

- B. WEATHERPROOF CONSTRUCTION:

1. All wiring or equipment installed exterior to buildings or in wet or damp locations shall be weatherproof construction to suit the service conditions.
2. Outlet boxes shall be gasketed; electrical metallic tubing shall have compression type fittings; lighting fixtures shall be designed for exterior installation.
3. All exterior mounted equipment shall be corrosion resistant and constructed in accordance with NEMA standards for the service conditions encountered.

- C. STRUCTURAL REQUIREMENTS: Installation under this Section shall comply with the Uniform Building Code and Title 24.

- D. MANUFACTURER'S DIRECTIONS: Follow manufacturer's directions where these directions cover points not included in the drawings or in the specifications.

- E. WORKMANSHIP: Workmanship shall be of the best quality and shall be performed by craftsmen to insure long and trouble-free service. The requirements of the Codes and Safety Orders are minimum standards.

- F. CUTTING AND PATCHING: This Contractor shall be responsible for all cutting and patching required for the installation of the electrical work under this Section. The actual cutting and patching work shall be executed by the appropriate trade involved under the supervision of the General Contractor, but the cost of such cutting and patching shall be borne by this Contractor.

1. Neither holes or notches shall be made in any structural member without the written approval of the Structural Engineer for each specific location.
 2. This Contractor shall arrange for, and bear all costs for, all necessary sleeves or openings in masonry, concrete, or other structural elements where such are permitted by the Structural Engineer.
- G. **CLEANING:** Keep the premises in a neat, safe and orderly condition at all times during the execution of the electrical work. Areas adjacent to the electrical work, both interior and exterior shall be free from accumulations of debris and/or shipping containers and packing. All refuse shall be removed to the area of the job site set aside for its storage.
- H. **FLASHING AND SEALING:** Flash and counter flash roof and wall penetrations in manner described under other applicable sections of this specification and as approved by the Architect. Conduits, ducts, etc. passing through finished walls shall be fitted with steel escutcheon plates, chrome or paint finish as directed. Conduits which penetrate floor slabs and concrete or masonry walls shall be grouted and sealed watertight at penetration in addition to escutcheon plate trim.
- I. **Cooperation and Coordination:** Cooperate and coordinate with other crafts in putting the installation in place at a time when the space required by this installation is accessible. Works done with disregard to other crafts shall be moved at the Contractor's expense.
- J. **TESTING:** The entire electrical installation shall be free from short circuits and improper grounds. Test all ground fault protection equipment where so provided. Test all wiring and connections for continuity and grounds before any fixtures or equipment are connected and where such test indicate faulty insulation or other defects, they shall be located, repaired and retested at the contractor's expense. Electrical load shall be balanced at the panelboards. Rotation of all motors shall be checked and corrected, if necessary, after final connections are made.
1. Merger test insulation of all new feeder cables for a length of 30 seconds prior to connection between phases, between phase and neutral and between phase and ground. Use a 1000 Volt Megger. Provide a copy of test results for review by Engineer. Cables shall test at 2.5 Megohm or better..
 2. System test shall be performed only by an individual who has attend a manufacturer's training school for installation and testing the system as described herein. Testing of the system shall be performed with the test instruments as required by manufacturer; provide all instruments to make such test. Testing by means other than the manufacturer's procedures will not be acceptable unless agreed to by the Owner, specifying Engineer and the Manufacturer.
 3. For each test, the test report shall provide the following information.
 - a. System Tested.
 - b. Date Tested.
 - c. Persons present during the test.
 - d. Schedule of actual tests carried.
 - e. Conclusion.

- f. Signature by person responsible for the test.
 - g. Date of the report.
- 4. Demonstrate to the Owner and the Architect, that the entire installation is complete, in proper operating condition and that the Contract has been has been property and fully executed.
- K. ACCEPTANCE BY GOVERNING AUTHORITIES: Upon the completion of the electrical work, and as a condition of its acceptance, this Contractor shall obtain final inspections and acceptance from local building inspection agencies, utility companies, and/or other governing authorities. Deliver to the Owner and the Architect verification of such acceptance.

3.3 COMPLETION:

- A. Upon completion of work covered by this Contract, furnish Architect with Mylar transparencies, as required by the General Conditions, upon which shall be shown all changes of feeders, panels, circuits, light fixtures, etc., within building and installed under this contract, which are not in accord with these drawings for the work. Diazo sepia transparencies will not be acceptable.
- B. In addition, furnish one tracing showing all outside utility lines, transformer pad, pullboxes, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "Record" drawings shall match those used in contract drawings. All record drawings shall be produced by CAD using same size of plan and symbols as the project plans. Each Sheet shall have "As-Built Plan" and date printed on it with complete address of the Contractor providing the As-Built plans.
- D. Properly identify all stubs for future connections, as to locations and use, by setting of concrete marker at finished grade in the manner suitable to the Architect.
- E. Guarantee: Acceptance of the Contract for this work includes this guarantee: The Contractor guarantees that he has performed the work in accordance with the Contract Documents. Contractor agrees to replace or repair, as new, any defective work, materials, or part which may appear within one years of final acceptance, if in the opinion of the Architect or the Owner the defect is due to workmanship or material.

Warranties, guarantees, certificates, etc. that are furnished and available for equipment and materials furnished and installed under this Section shall be properly filled out as of the date of the acceptance of the completed work by the Owner and shall be delivered to the Architect.

END OF SECTION

SECTION 26 05 19 – LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Conductors
- B. Lubricants
- C. Splices
- D. Pull Wires
- E. Cable Identification

1.2 RELATED SECTIONS

- A. Section 26 05 33: Raceways and Fittings
- B. Section 26 27 26: Wiring Devices
- C. Section 26 50 00: Lighting

1.3 REFERENCES

- A. California Electrical Code 2016 Edition

PART 2 PRODUCTS**2.1 CABLES**

- A. Cables shall be 600V, insulated copper cables, CEC standard Types THW, THWN, THHN, or AVA, as manufactured by Essex, Houston Wire & Cable, American Insulated Wire Corp. or Rome Cable Company, subject to the following:
 - 1. Branch circuit cables shall be copper cables, Type THWN, unless otherwise noted.
 - 2. Cables for feeders and branch circuits installed on the roof, when permitted, shall be copper cables, Type THWN/THHN, unless otherwise noted.
 - 3. Minimum size of all cables shall be #12 AWG unless otherwise indicated on the drawings.
 - 4. Cables shall be delivered to the site in unbroken packages, plainly marked with the manufacturer's name, date of manufacture (not more than six months old), voltage size and classification number.
 - 5. All wiring in continuous rows of fluorescent fixtures shall be Type MTW/AWM.
 - 6. MC Cable and AC Cables are not approved on this project.

2.2 LUBRICANT

- A. Lubricant for cable installation shall be powdered soapstone, Y-er EAS, Minerallac "Pull In" compound or other U.L. approved lubricant. Flax soap is not approved and not permitted on the job.

2.3 SPLICES

- A. Splices of #10 and smaller, including fixture tape, shall be made with "Scotchlok" connectors, T&B "Piggys" or equal.

- B. Splices of #8 through #4 shall be split bolt service connectors "Kerneys", T&B "Lock Tites" or equal, insulated with Scotch #88 or Okeweld four-purpose tape.
- C. Splices #2 and larger shall be OZ "ST" Series insulated with "Scotchfill" and Scotch #88 or Okeweld.
- D. Splices in underground pull boxes shall be Scotchcast cast resin splices.
- E. Wire splicing devices shall be sized according to manufacturer's recommendations.

2.4 CABLE IDENTIFICATION

- A. Non-ferrous identifying tags or pressure sensitive labels shall be securely fastened to all cables, feeders and power circuits in pull boxes and manholes. Tags or labels shall be stamped or printed to correspond with markings on drawings or marked so that feeder or cable may be readily identified.

2.5 PULL WIRES

- A. Install a #12 THWN pull cable in all empty conduits 1" size or under and a 3/16" polypropylene rope in all conduits 1-1/4" and larger in trade size.

PART 3 EXECUTION

3.1 INSTALLATION OF CONDUCTORS

- A. See Section 26 05 33, Part 3, "Execution".

END OF SECTION

SECTION 26 05 26 – GROUNDING**PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Grounding System

1.2 RELATED SECTIONS

- A. Section 26 05 33: Raceways and Fittings
- B. Section 26 05 19: Low Voltage Cables

1.3 REFERENCES

- A. California Electrical Code 2016 Edition

PART 2 PRODUCTS**2.1 MATERIALS**

- A. See Section 26 05 19 for Cables.

PART 3 EXECUTION**3.1 GROUNDING AND BONDING**

- A. Grounding and bonding shall be installed as required by the applicable codes, rules, regulations, and safety orders. Attention is directed to Article 250 of the California Electrical Code.
- B. All raceway systems, supports, cabinets, switchboard, motor control equipment, motor frames, lighting fixtures and utilization apparatus shall be permanently and effectively grounded.
- C. Where the raceway is used as equipment bond, good contact shall be made between conduit or tubing and panels, cabinets, outlet boxes and equipment, lighting fixtures, etc. to maintain continuity of equipment bond. Where it is not possible to obtain good contact, additional bonding shall be provided. Supplemental bonding shall be provided between raceway and enclosures at concentric knockouts and at reducing washers.
- D. All non-metallic raceways exclusive of telephone and signal shall contain a code size copper conductor, green insulated, properly bonded to equipment at either end and to metallic portions of the same raceway.
- E. All grounding type receptacles shall be bonded to outlet box, using code size copper conductor, green insulated, attached to receptacle grounding terminal and to lug or screw terminal in box.
- F. Provide insulated green ground wire, run with the branch circuit conductors in the same raceway, for all power and lighting circuits.
- G. Provide bonding conductor around flexible metallic conduit (Greenfield). Bonding conductor shall be inside flex.
- H. Raceway size shall be increased if necessary to accommodate bonding conductors and shall be based on raceway fill tables.
- I. Where cabinets are furnished with grounding bus, all required bonding conductors should connect thereto, each with separate lug.

END OF SECTION

SECTION 26 05 33 – RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1- GENERAL

1.1 SECTION INCLUDES

- A. Raceways
- B. Conduit Fittings

1.2 RELATED SECTIONS

- A. Section 26 05 19: Low Voltage Cables
- B. Section 26 27 26: Wiring Devices

1.3 REFERENCES

- A. California Electrical Code 2016 Edition

PART 2- PRODUCTS

2.1 CONDUITS AND FITTINGS:

- A. All low voltage wiring shall be in raceways. Raceways shall be run underfloor, in walls, above ceilings or exposed as indicated on drawings. Acceptable raceway systems and their limitations of use are as follows:

- 1. Rigid Steel Conduit may be used in all areas.

- a. Standard weight, zinc coated on outside by hot dipping or sheradized process, with either zinc coating or other approved corrosion resistant coating on the inside.
- b. Fittings shall be threaded and finished similar to conduit. Threadless fittings shall not be used.

- 2. Electrical Metallic Tubing (EMT):

- a. Rolled steel, zinc coated outside with either zinc-coating or other approved corrosion resistant coating on the inside.
- b. Couplings shall be steel, rain compression type Appleton TWC-CS Series or equal.
- c. Connectors shall be steel raintight compression type with insulated throat Appleton TW-CSI Series, Series or equal. Steel setscrew connectors may be used instead where such use is approved by code.
- d. Zinc die-cast fittings are not permitted to be used anywhere on this project.
- e. May be used:
 - 1) Concealed in drywall partitions
 - 2) Concealed above furred ceilings.
 - 3) Exposed in Mechanical rooms.
- f. May not be used:
 - 1) Any location subject to physical damage.
 - 2) Any other areas not listed under (d) above unless specifically otherwise noted on plans.

the

- 3. Flexible Metal Conduit may be used only for indoor final connections to mechanical equipment (not to exceed 36") and final connections to fluorescent lighting fixtures (not to exceed 72").

- a. Minimum trade size - one-half inch (1/2").
- b. Connectors - T & B "Tite Bite" insulated.

- c. Suitable for connection of recessed fixtures, control and mechanical equipment. Not permitted where exposed to weather or other wet or corrosive conditions.
 - d. Length shall be a practical minimum, but to allow for movement of equipment connected without restricting flexibility of conduit.
 - 4. Liquid Tight Flexible Metal Conduit - Sealtight: May be used only for outdoor final connections to mechanical equipment.
 - a. Minimum trade size - one-half inch (1/2").
 - b. Connectors - Appleton STB Series through two inch trade size and ST Series with insulated bushings over two inch trade size. Appleton, Crouse-Hinds or equal may be used.
 - c. Length shall be practical minimum, but to allow for movement of equipment connected without restricting flexibility of Sealtight.
 - 5. Poly-Vinyl-Chloride Schedule 40
 - a. Not permitted on this project.
 - 6. Surface Wiremold
 - a. Shall be used for branch circuits in areas where existing wall or ceiling finishes are being removed. Surface metal conduits are not acceptable in such cases.
 - b. Shall be metallic, finished, with matches boxes and accessories as Wiremold #V500 V700, sized per Code for wire fill.
 - 7. MC Cable
 - a. Not permitted on this project.
 - 8. AC Cable
 - a. Not permitted on this project.
 - 9. Type NM, NMC
 - a. Not permitted on this project.
- not
or
- 2.2 BOXES: Boxes shall be of the shape and size best suited for the particular application and shall be supported directly to structural members, framing or blocking by means of screws, anchors, bolts or embedded in masonry.
- A. Switch and receptacle box shall be one piece drawn steel boxes or stamped steel boxes. Minimum size shall be four inches (4") square. Boxes shall be fitted with flush device covers, plaster rings, or tile switch rings in masonry. In areas where exposed wiring is permissible, boxes shall be fitted with surface type covers.
 - B. Lighting outlets shall be four inch (4") octagon.
 - C. Weatherproof boxes shall be Appleton FD Series and fitted with gasketed cast covers.
 - D. Telephone and television outlet boxes shall be 4-11/16" x 2-1/2" deep minimum, fitted with plaster rings.
 - E. Boxes for special equipment shall be suitable for the particular equipment.
 - F. Boxes shall be located and placed according to architectural and structural requirements.
- 2.3 FLOOR BOXES
- A. Boxes shall be single service or multi-service as noted on plans.
 - B. Boxes shall be provided with all required accessories for a complete and working installation, including trim ring/coverplate.
 - C. Provide minimum (2) duplex outlets in the box.

- D. Provide mounting brackets for communications outlets in multiservice boxes.
- E. Boxes shall be suitable for floors in which they are to be installed. Shall be such that covers can be completely closed after both power and data cords have been plugged in.
- F. As manufactured by Wiremold, Hubbell, Steel City or approved equal.

2.4 PULL OR JUNCTION BOXES

- A. Install where indicated, or as required by Code, pull boxes and junction boxes of sufficient size and capacity to facilitate all wiring. Boxes shall be fabricated of code gauge steel and sized to properly accommodate all conductors entering same.

2.4 SUPPORTS:

- A. Furnish all necessary foundations, supports, backing, etc., for all electrical enclosures, conduits and equipment. Attach all boxes, cabinets, etc. to wood with wood or lag screws, to metal with machine screws or bolts and to concrete with expansion anchors and machine screws or bolts.
- B. Electrical lighting fixtures weighing 50 lbs. or more shall not be installed using wood screws for supports to the ceiling. Each such fixture shall have pre-stretched galvanized wires or rods anchored to the roof or structural member of the building.
- C. All hangers and supports shall be designed and constructed for the intended purpose.
- D. Materials shall be as manufactured by Unistrut, Powerstrut, or approved equal.
- E. The use of makeshift materials such as wire or plumber's tape will not be permitted.
- F. Exposed horizontal runs of feeder raceways shall be mounted on trapeze type hangers, secured to the concrete slab with approved type drilled-in-place inserts.
- G. Vertical runs of feeder raceways shall be supported and fastened per Code.

2.5 TERMINAL CABINETS:

- A. Terminal cabinets shall be of panelboard type construction and finish.
- B. Trim shall be fitted with hinged door and flush latch.
- C. Doors shall provide maximum size openings to box interior.
- D. Boxes shall be provided with half inch (1/2") backboard having a two coat insulating varnish finish.
- E. Top of cabinet shall be 6'-6" above finished floor.
- F. Flush terminal cabinet installed adjacent to flush panelboards shall be of the same physical size and trim as the panelboard.
- G. Terminal cabinets shall be as manufactured by B-Line, Hoffman or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION OF RACEWAYS AND FITTINGS

- A. Conceal raceways within ceilings, walls, and floors except where exposed raceways are specifically permitted.
- B. Where conduit is allowed to be exposed, install the conduit parallel with or at right angles to structural members, walls, and lines of the building.

- C. Install where indicated, or as required by Code, pullboxes and junction boxes of sufficient size to facilitate wiring. Boxes shall be sized to properly accommodate all conductors entering same.
- D. Do not install conduit or tubing, which has been crushed or deformed.
- E. Run conductors of same circuit in same conduit. Run conductors of different voltage systems in separate conduits.
- F. Install no conductors until work, which might cause damage to such conductor or the conduit has been completed.
- G. Keep all conduits at least six inches away from the covering on hot water or steam pipes.
- H. Cap raceway ends during construction. Clean or replace conduits in which water or foreign matter have accumulated, to satisfaction of the Architect.
- I. Conduits shall be supported with straps, with galvanized malleable split ring and rod for individual runs or with Kindorf or Unistrut channel supports for multiple runs. Distance between supports shall not exceed 10 feet for rigid threaded galvanized conduits and concealed EMT Conduit and 5 feet for exposed surface mount EMT conduit. Conduits shall be supported independently of one another.
- J. Conduits run on roof shall be fastened to an ERICO pipe support set on roof, using galvanized double hole straps and screws. Multiple conduit runs shall be gathered neatly in straight liens and fastened individually to the pipe support. Conduits shall not be run on the roof except where specifically noted on the plans or approved by the Engineer and Architect.
- K. Conduits connected to boxes and cabinets shall be fitted with two locknuts and insulated bushing, OA "A" Series.
- L. Conduits not connected with locknuts and bushings shall be fitted with grounding bushing, OZ "BL" Series, U. L. approved and bonded.
- M. Conduit stubs underground shall be capped with coupling, nipple, coupling and plug.
- N. Conduits connected to boxes, cabinets, etc., exposed to weather or in areas subject to excessive moisture shall be fitted with watertight sealing hubs of steel or malleable iron with sealing ring and insulated throat, T & B 370 Series, Efcor 40-50B Series or equal.
- O. Install insulate bushings on each end of steel conduit 1-1/4" and larger.
- P. Conduit straps for individual runs shall be secured by toggle bolts on hollow masonry, expansion shields and machine bolts on solid concrete or masonry, machine screws or bolts on metal surfaces and wood screws on wood construction. The use of nails to anchor straps on wood construction is prohibited. Straps shall be two hole malleable iron or snap-type steel with ribbed back, galvanized or cadmium plated. The use of perforated strap iron or nail type straps is prohibited.
- Q. Placement of all boxes shall be governed by applicable architectural and structural requirements.
- R. Conduit fittings: Except where otherwise noted, conduit fittings shall be Appleton. Unilets shall be malleable iron and fitted with covers and gaskets. Zinc diecast conduit fittings are not approved for use on this project.
- S. Telephone and signal conduit bends where required shall have a radius of ten times the conduit trade size.
- T. Conduit, subject to limitations noted elsewhere in the specifications, may be installed in concrete slab provided prior approval of the Architect is obtained. In such a case, locate

conduit in center of slab, unless otherwise instructed. Such conduit shall have an outside diameter less than one-third the thickness of the slab.

- U. Underground conduit bends shall have a minimum radius of twelve times the conduit trade size.
- V. Conduits shall be capped during construction.
- W. Provide pull wires in empty conduits. Size shall be #12 TW in conduits 1" and smaller and 3/16 polypropylene rope in conduits 1-1/4" and larger.
- X. Minimum size underground conduit shall be 3/4".

3.2 INSTALLATION OF SUPPORT SYSTEMS:

- A. All conduits and fixtures shall be supported in a firm and secure manner as required by code. Materials shall be secured to the structure by means of suitable clamps and hangers specifically designed for the purpose and using machine screws or bolts on metal or wood screws on wood construction.
- B. Rigid steel conduit shall be supported at intervals not greater than 10 ft, electrical metallic tubing at intervals not greater than 5 ft.
- C. A support shall be provided not more than 3 ft. from any change in direction. Additional supports to those specified above shall be installed where required to suit job conditions and to provide a secure installation. All hangers and supports shall be the products of one manufacturer, as specified in Part 2 of this Section.

3.3 OUTLET, JUNCTION, AND PULL BOXES:

- A. All boxes shall be of sufficient size to contain, without crowding, all wires, connections, and devices which may be required in any particular location. Extra deep boxes shall be provided wherever necessary to meet these requirements.
- B. Use outlet boxes as pull boxes wherever possible.
- C. Provide raised covers as required to suit the type and thickness of wall finish in each location.
- D. When other than outlet boxes are employed, pull boxes and covers shall be galvanized steel, code gauge, sized to accommodate wiring and connections. Locate such junction boxes only in equipment rooms, wire closets, and above accessible ceilings.
- E. All junction boxes shall be fully accessible according to code.

END OF SECTION

SECTION 26 24 16 - PANELBOARDS**PART 1 GENERAL****1.1 THIS SECTION INCLUDES**

- A. Panelboards.

1.2 RELATED SECTIONS

- A. Section 26 05 26: Grounding and Bonding System.
- B. Section 26 28 00: Low Voltage Circuit Protective Devices.
- C. Section 26 24 13: Switchboards

1.3 REFERENCES

- A. California Electrical Code 2016 Edition.
- B. UL 67. Testing of Short Circuit Duty.

PART 2- PRODUCTS**2.1 PANELBOARDS**

- A. Panelboards shall be as manufactured by Square D, Eaton, General Electric or Siemens.
- B. Bussing Assembly and Temperature Rise: Panelboard bus structure and main lugs or main circuit breaker (as shown on drawing) shall have current ratings as shown on the panelboards schedule. Bus structure shall be insulated. Bus bar connections to the branch circuit breakers shall be the phase sequence type and shall accept bolt on circuit breakers. All current carrying parts of the bus structure shall be plated, copper only. Neutral bus and ground bus shall be plated, copper. Provide isolated ground copper bus where so called out on the plans.
- C. Circuit breakers: See Section 26 28 00.
- D. Cabinets and Fronts: The panelboard bus assembly shall be enclosed in a steel cabinet as specified in UL Standard 50 for cabinets. Wiring gutter space shall be in accordance with UL Standard 67 for panelboards. The box shall be fabricated from galvanized steel or equivalent rust resistant steel. Each front shall include a door and have a flush, cylinder tumbler-type lock with catch and spring-loaded stainless steel door pull. All panelboards locks shall have be keyed alike. Fronts shall have adjustable indicating trim clamps, which shall be completely concealed when the doors are closed. Doors shall be mounted with completely concealed steel hinges. Fronts shall not be removable with door in the locked position. Column width fronts shall have exposed hinges and be screw cover type. A circuit directory frame and card with a clear plastic covering shall be provided on the inside of the door. Panelboards shall have door-in-door construction.
- E. Panelboards shall be provided with proper gutter space, approved barriers and adjustable supports.
- F. Multiple pole circuit breakers shall have internal common trip connection. Single pole breakers shall not be tied at handles to form multiple pole breakers. All circuit breakers shall be of the bolt-on type unless otherwise noted.
- G. Circuit breakers to be installed within panels to be installed on the roof shall be of the ambient compensated type.
- H. Circuit breakers for switching fluorescent lighting and H.I.D. lighting shall be so labeled and rated respectively.

- I. Handle "Lock-On" devices shall be furnished for ten percent (10%) of the circuit breakers.
- J. Cabinets and switchboard shall be fitted with copper grounding bus, similar to neutral bus, not insulated from enclosure. Bus shall be complete with lugs.
- K. Cabinets, doors and trim shall be finished in ASA 61 or standard factory gray enamel.
- L. Busses shall extend full length of useable space of distribution sections.
- M. Where indicated on the drawings, panelboards shall contain factory-installed bus connected and integrated TVSS with internally self-contained primary 200k AIC fuses. The manufacturer of the panelboard shall be the manufacturer of the TVSS.

PART 3 - EXECUTION

3.1 INSTALLATION OF PANELBOARDS

- A. The Contractor shall comply with the following requirements relative to the installation of the panelboards and cabinets under this Section.
- B. Cabinets shall be surface or flush mounted, as specified and provided with door and trim, complete with concealed hinges.
- C. Cabinet fronts shall be fastened to the cabinets with adjustable trim clamps.
- D. Surface mounted cabinets shall be finished to match trim.
- E. Semi-recessed panels shall be fitted with a wood or metal escutcheon providing neat return to wall finish, flush with edge of trim.
- F. Wall mounted cabinets shall be mounted with top of cabinet 6'-6" above finished floor.
- G. Conduits shall enter cabinet through neat hole and perpendicular to entrance face.
- H. Panelboard directories shall be typewritten and conform to room description (not plan numbers).
- I. Conductors shall be neatly laced with T & B Ty-raps.
- J. Nameplates shall be as hereinbefore specified.
- K. Recessed cabinets shall be provided with a minimum of (3) 3/4" empty conduits stubbed into accessible space. Drawings may require additional conduits.

END OF SECTION

SECTION 26 27 26 – WIRING DEVICES**PART 1 - GENERAL****1.1 SECTION INCLUDES**

- A. Wiring Devices

1.2 RELATED SECTIONS

- A. Section 26 05 19: Low Voltage Cables

1.3 REFERENCES

- A. California Electrical Code 2016 Edition

PART 2 - PRODUCTS**2.1 WIRING DEVICES:** Units shall be equal to the devices set forth herein, in standard colors (brown, white, grey, beige, red, or ivory) as selected by the Architect:

A. WIRING DEVICES	LEVITON#	HUBBELL#	P&S#
Single pole switch 15A	1201-2	HBL1201	PS15AC1
Single Pole Switch, 20A	1221-2	HBL1221	PS20AC1
Double Pole Switch 15A	1202-2	HBL1202	PS15AC2
Double Pole Switch 20A	1222-2	HBL1222	PS20AC2
Threeway Switch 15A	1203-2	HBL1203	PS15AC3
Threeway Switch 15A	1223-2	HBL1223	PS20AC3
Duplex conv out 15	5262	HBL5262	5262
Duplex conv out 20A	5362	HBL5362	5362
Isol ground outlet 15A	5262IG	IG5262	IG5262
Isol gorund outlet 20A	5362IG	IG5362	IG5362
Duplex Conv GFI Outlet 15A	6599	GF15	1595L
Duplex Conv GFI Outlet 20A	6899	GF15	2095L

- B. All switches on this project shall be rated 15A, U.O.N. on plans.

- C. All receptacle outlets on this project shall be 15A, U.O.N. on plans.

- D. Single receptacle on an individual 120V, 20A branch circuit shall be rated 20A per CEC 210.21(B)(1).

2.2 DEVICE PLATES

- A. All device plates for indoor use shall be smooth nylon or approved equal unless otherwise noted. Color shall match the color selected by Architect in paragraph 2.1 above.
- B. All device boxes which are installed in fire rated wall assembly and are provided with a fire-stopping putty pad shall have a brushed stainless steel coverplate in accordance with the requirements of the putty pad.

- C. Install multiple gang plates where devices are grouped.
- D. Device covers for surface mounted boxes shall be ½" raised steel plates.
- E. Device covers for devices located in damp locations shall comply with CEC 406.8(A).
- F. Device covers for devices located in wet locations shall comply with CEC 406.8(B).
- G. Cover for weather proof outlets and switches shall be as follows:
 - 1. While-in-use coverplates for duplex outlets - Legrand #WICUCAST1
 - 2. WP coverplate for duplex outlet, heavy cast aluminum - Legrand #4510, 4511, 4512
 - 3. WP, Toggle Switch Cover with actuating lever - Legrand #CA1GL
 - 4. WP, Self-Closing Lid over toggle switch - Legrand #CA1GL
 - 5. Dust proof stainless steel cover, not weatherproof - Legrand #WP1, WP2, WP3, #WP2GL(K.KEY)

PART 3 - EXECUTION

3.1 GENERAL

- A. See Section 26 05 00 for Basic Execution methods.

3.2 INSTALLATION OF WIRING DEVICES

- A. Boxes for light switches shall be installed at +48" to top of box. In case device falls inside the line of any change in wall finish, lower the device to be wholly within the lower wall finish.
- B. Boxes for power and communications devices shall be installed at +16" to top of box unless otherwise noted.
- C. Devices on walls above countertops shall be installed 4" above countertop surface or backsplash. Such outlets shall be installed horizontally.
- D. Verify exact location of all outlets with architectural plans, cabinetry, equipment connections, etc, prior to rough-in.
- E. Grounding type receptacles shall be installed with the grounding pin up above the hot and neutral pins.
- F. Outlets installed outdoors shall be provided with coverplates noted in Paragraph 2.2 above.
- G. Outlets installed outdoors, in bathrooms, rooftops and in Kitchen shall be GFI type, except outlets in Kitchen which are dedicated to specific appliances.

END OF SECTION

SECTION 26 28 00 – LOW VOLTAGE CIRCUIT PROTECTIVE DEVICES

PART 1 GENERAL

1.1 THIS SECTION INCLUDES

- A. Enclosed Switches/Disconnects.
- B. Circuit Breakers.

1.2 RELATED SECTIONS

- A. Section 26 05 00: Common Work Results for Electrical
- B. Section 26 05 26: Grounding and Bonding System
- C. Section 26 24 16: Panel Boards
- D. Section 26 24 13: Switchboards

1.3 REFERENCES

- A. California Electrical Code 2016 Edition

PART 2 PRODUCTS

2.1 DISCONNECT SWITCHES:

- A. Heavy duty, Eaton, Square D, Siemens or General Electric to match manufacturer of the new Panelboards.
- B. Disconnect switches for motor loads shall be horsepower rated.
- C. Disconnect switches installed outdoors or in wet or damp locations shall be weatherproof type and shall comply with NEMA standards for the service conditions.
- D. Disconnect switches shall be fused, rating as required for the service conditions and as required by Code. Fuse rating shall match the highest nameplate rating of the equipment served.
- E. Disconnect switches shall be located within sight of the load served as required by Code.

2.2 FUSES:

- A. Fuses shall be current limiting Buss fuses as manufactured by Bussman Manufacturing Division, McGraw-Edison Co., Class L or T or equal.
- B. Furnish fuses for all fused switches as required.

2.3 CIRCUIT BREAKERS:

- A. Circuit breakers shall be molded case, equipped with arc quenchers, and shall be of the indicating type, providing "On," "Off," and middle "Tripped" positions of the operating handle. Circuit breakers shall be front-connected and shall be removable without disturbing adjacent units or without removing the main bus of the circuit branch connectors. Circuit breakers shall be of the quick-make, quick-break type on manual operation, trip-free with inverse time characteristics secured by the use of bimetallic tripping elements supplemented by a magnetic trip. All circuit breakers serving multi-wire circuits where two or more poles are required shall have all poles automatically and simultaneously

disconnected. Single-pole breakers with handle ties will not be acceptable.

- B. Circuit breakers shall be of the same manufacture as the panelboards and switchboards.
- C. Feeder circuit breakers interrupting capacity shall be coordinated with main circuit breaker rating for the available short circuit current at each switchboard.
- D. Circuit breakers in panelboards shall be bolt-on type as noted, full size, with a minimum interrupting rating of 10,000 amps symmetrical.
- E. The use of tandem or half-size breaker is not permitted.
- F. Circuit breaker feeding power to Fire Alarm Control Panel and Booster Power Supplies shall be red handles, with lock-on device.

PART 3 EXECUTION

3.1 INSTALLATION DISCONNECT SWITCHES:

- A. Provide disconnect switches where shown on the Drawings or where required by code even if not shown on the Drawings. Locate all disconnects as required by code, ensuring full access and working clearances.
- B. Outlets shall not be mounted on disconnects.
- C. Disconnects shall not be used as through raceways.
- D. Provide enclosure, NEMA 1 or NEMA 3R depending on location, for standalone circuit breaker.

END OF SECTION

SECTION 26 50 00 – EXTERIOR LIGHTING**PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Lighting outdoors.

1.2 RELATED SECTION

- A. Section 26 27 26: Wiring Devices

1.3 REFERENCES

- A. California Electrical Code 2016 Edition.
- B. California Energy Code 2016
- C. California Building Code 2016
- D. I. E. S. Lighting Standards, 10th Edition.

PART 2 PRODUCTS**2.1 LIGHTING FIXTURES**

- A. Units shall be as designated in the Lighting fixture schedule on the drawings. All fixtures shall bear the Underwriters' Laboratories label. All fluorescent fixtures shall be equipped with CBM-ETL certified ballasts provided with internally mounted automatic reset thermal protector and silver plated sockets. All LED fixtures shall be equipped with LED lamp modules, LED drivers.
- B. All pole-mount fixtures shall be LED type with integral motion sensors and dimming type LED drivers, all in compliance with California Energy Code.
- C. Fixtures mounted against combustible material shall be approved for such installation.
- D. All equipment or materials for any one system shall be furnished by the same manufacturer. Items such as lamps, conduits fittings, and wiring devices shall be the same throughout the job.
- E. Fixtures shall be complete with lamps, all fitting, accessories, and supports necessary for a complete and operable installation.
- F. Verify finish color of all fixtures with Architect prior to ordering.

2.2 LIGHTING CONTROLS

- A. Photo cell and motion sensor shall comply with California Energy Code Section 130.2 (c).
- B. Time Clock shall be Intermatic, 7 day programmable, Astronomic 2 channel, with field replaceable industrial grade batteries as ET 8000 series or equal.
- C. Lighting contactors shall be as manufactured by Square D Co. Type "SMG", electrically held, with number of poles per plans. Provide housing as noted on plans.

PART 3 EXECUTION**3.1 GENERAL**

- A. See Section 26 05 00 for Basic Execution methods.

3.2 INSTALLATION OF LIGHTING FIXTURES

- A. For building mount fixtures, verify with Architect mounting heights of all light fixtures.
- B. For polemount fixtures, provide concrete base with steel reinforcement as shown on the plans. Determine exact location of pole in coordination with Landscape and Civil plans.
- C. Install lighting fixtures in accordance with code requirements.
- D. Provide all supports for lighting fixtures in accordance with code requirements for installation in seismic zone in which the Facility is located.
- E. Lamp all new fixtures with lamps of the designed rating and pattern as noted on the plans. Lamps utilized in excess of 12 hours shall be replaced with new lamps immediately before project acceptance by the owner.
- F. Set all controls as noted on plans and directed by owner in field.

3.3 CLEANING:

- A. On completion of the work, al fixtures and lenses shall be left clean. Any minor damage or scratches shall be touched up to the satisfaction of the Architect.

END OF SECTION

SECTION 26 51 00 - INTERIOR LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Lighting indoor.

1.2 RELATED SECTIONS

- A. Section 26 27 26: Wiring Devices

1.3 REFERENCES

- A. California Electrical Code 2016 Edition.
- B. California Energy Code 2016 Edition.
- C. I. E. S. Lighting Standards, 10th Edition.

PART 2 - PRODUCTS

2.1 LIGHTING FIXTURES

- A. Units shall be as designated in the Lighting fixture schedule on the drawings. All fixtures shall bear the Underwriters' Laboratories label. All fixtures shall be equipped with LED drivers. Such drivers shall have 0-10V dimming capability where so called out. Additionally:
- B. Fixtures mounted against combustible material shall be approved for such installation.
- C. Recessed fixtures installed in fire rated ceilings shall have housing approved by the State Fire Marshal. Provide separate fire rated enclosure in accordance with local jurisdiction requirements when such housing is not available. Recessed fixtures shall be supported to satisfy earthquake requirements.
- D. All fixtures shall be wired with Type AF or equal fixture wire. Joints shall be made up as specified under "Conductors".
- E. All equipment or materials for any one system shall be furnished by the same manufacturer. Items such as lamps, conduits fittings, and wiring devices shall be the same throughout the job.
- F. Fixtures shall be complete with all fitting, accessories, and supports necessary for a complete and operable installation.
- G. Fixtures shall be equal in design, quality, utility, material and workmanship to those specified and shall have been tested and approved by all necessary authorities and agencies before being submitted for approval.

2.2 LED DRIVERS:

- A. LED drivers shall be 0-10V dimming type.
- B. Lamp modules shall have a CRI of minimum 82.

2.3 LAMPS:

- A. Lamps shall be long life LEDs with lumen maintenance of 90% at 60,000 hours (L90/60,000) for 4ft fixtures and 70% at 50,000 hours for recessed down lights.

B. Lamp color shall be as noted on the plans.

2.4 FOUR FOOT FIXTURE LENSES:

- A. Manufacturers: Carolite, KSH, or Plaskolite.
- B. Domestic origin, 100% virgin acrylic, high molecular weight
- C. Pattern as specified under fixture description
- D. Crowned to prevent sag
- E. 1/8' normal thickness

2.5 OCCUPANCY MOTION SENSOR LIGHTING CONTROL SYSTEM:

A. General requirements:

1. Provide a complete and fully operational occupancy motion sensor lighting control system for interior lighting as specified herein and shown on the drawings.
2. The complete system, including all devices shall be in compliance with the 2013 California Energy Code.
3. The complete system shall be comprised of single or dual technology low voltage sensors, power packs and slave packs as required. Provide line voltage sensors where so indicated. Sensor technology shall be suitable for application as recommended by the manufacturer of the sensor.
4. All equipment and items of control shall be installed and wired in accordance with manufacturer's requirements. Particular attention shall be given to placement of sensors to provide maximum coverage and minimize false "ON's" and "OFFs". To this respect, coordinate ceiling sensor placement with HVAC duct registers to keep sensors a minimum of six feet from the registers. Provide additional sensors to those shown in rooms on drawings where deemed necessary to obtain adequate coverage according to the manufacturer.
5. Provide insulated ground wire to each line voltage sensor.
6. Provide ceiling mount occupancy sensors where so shown on plans. Such sensors shall be line voltage or low voltage. Provide power pack for each low voltage sensor or group of sensors. Sensor coverage shall be suitable for area to be covered. Locate power packs in accessible space or as noted on plans. Provide multiple sensors where coverage pattern so requires.
7. Provide wall occupancy sensor light switches where so shown on plans. Such occupancy sensors switches shall be single level automatic "ON"/automatic "OFF" or multi-level. As shown on plans. Sensors shall comply with Sections 119(d) and (e) of the Energy Code. Multi-level sensor shall be automatic on, activating 30-70 percent of lighting power in the room and capable of manually activating the remaining 100 percent of the lighting power and deactivating all lights.
8. The system shall automatically switch off all lights when controlled space becomes unoccupied and switch on lights when the space is re-occupied. All sensors shall be provided with user adjustable time delay (15 sec. to 20 minutes) for "switch-off" function and adjustable sensitivity. Sensors shall be U.L. listed and approved by the California Energy Commission.
9. The system shall be as manufactured by Sensor switch, nlight or approved equal.

B. Scope of function:

1. Automatically switch off lighting when controlled space becomes unoccupied. Switch on lights when the space is re-occupied. All sensors shall be provide with user adjustable

time delay for "switch-off" function and adjustable sensitivity. Sensors shall be UL listed and approved by the California Energy Commission.

2. Provide additional wall light switches to switch off the lights when the space is occupied and it is required to switch off the lights in the controlled spaces.
- C. Equipment: The following equipment as manufactured by nlight and Sensor switch is specified to determine quality and standard of product to be installed on this project. All substitute products shall have equal performance capability and quality.
 1. Automatic Dimming Control Photocell – nlight # NCMADCXRJB
 2. Ceiling mount Occupancy Sensor – nlight # NCMPDT9RJB
 3. On/Off/Raise/Lower 2 channel Wall Control – nlight #NPODM2PDXWH
 4. On/Off/Raise/Lower Single channel Wall Control – nlight #NPODMDXWH
 5. Low Voltage Wall Switch Occupancy Sensor – nlight nWSXPDTLVWH
 6. Line Voltage Wall Sensor Switch, Dual Tech – Sensor switch # WSXPDTWH
 7. Line Voltage Wall Sensor Switch, infrared – Sensor switch #WSXWH
 8. Low Voltage Ceiling Mount Occupancy Sensor – Sensor switch # CM9
 9. Plug load Control Power Pack – nlight #nPP20PL
- D. Shop Drawings: Provide shop submittals in accordance with Section 26 05 00, Paragraph 2.5. Provide layout of all sensor placements in all rooms of all the buildings where such systems are shown. Plans shall be of the same scale as the project electrical plans and shall be design by CAD program. Hand drawn locations are not acceptable. Provide these plans for review by Engineer at the same time as the equipment submittal.
- E. Low Voltage Wiring: Low voltage wiring is required to be in conduit.
- F. Spares: Provide three each spare of each type of device to the owner.

2.6 LINE VOLTAGE RELAY BASED AUTOMATIC LIGHTING SHUT-OFF CONTROL SYSTEM

A. GENERAL REQUIREMENTS:

1. An automatic line voltage shut off control system shall be provided for the interior lighting of the areas shown on the plans in compliance with the 2010 California Energy Code.

An automatic time switch control device shall be installed to comply with Section 131(d)1. This device shall be part of a comprehensive intelligent lighting controller, complete with timers, keypad, relays, power supply, etc.

An override line voltage switching device shall be provided to comply with Section 131(d)2.

An automatic line voltage shutoff switch shall be provided to comply with Section 131(d)1.

The light switches for individual rooms and spaces shall serve as:

- a) On/Off switches for the lights.
- b) Override switch to comply with Section 131(d)2 of the energy code.
- c) Automatic shutoff switch to comply with Section 131(d)1 of the energy code.
2. All lights shall be switched on and off using line voltage automatic shut-off on/off switches unless otherwise shown. They shall additionally be switched off automatically through the automatic shut-off control panel.

3. The system shall be as manufactured by LC&D or approved equal. Control panel shall be type LC&D type Blue Box.
4. The line voltage switches shall be automatic shut-off type Legrand #AS-100. Any substitute requires prior approval of the Engineer. Low voltage switches are not approved.
5. The entire lighting control system shall be wired and programmed to meet the above mentioned requirements.
6. The control panel shall be surface or recessed mounted as shown on the plans.
7. All exit signs shall be unswitched and not pass through the automatic shut off control panel.
8. All emergency light fixtures with integral battery shall be switched as shown and shall come on in emergency power-off mode upon power failure. To this effect provide an unswitched power wire to each such fixture from the same circuit as that feeding the light fixture.
9. Controller shall be set to provide a sweep off for all interior lights controlled, except night lights. Such a sweep shall be repeated at an interval not exceeding two hours for the entire period the building is not normally occupied. Verify with the Owners as to the times the space is normally occupied.
10. Provide a "blink" warning to an impending light shutoff sweep.
11. Provide submittals for review and approval by the Engineer. Submittals shall be comprehensive, specific to this project with detailed Bill of Material, equipment brochures, relay schedules, riser diagram, etc. See Section 26 05 00.
12. Provide three sets of complete installation and operational instructions to the Owner or his representative. Provide on-site factory startup, checkout and training by factory representative. On site training shall be a minimum of four hours of training on how to operate and program the system and on how to modify timing schedules.
13. Warranty: Provide the standard one-year parts and labor warranty required for this entire project.

PART 3 - EXECUTION

3.1 GENERAL

- A. See Section 26 05 00 for Basic Execution methods.

3.2 INSTALLATION OF LIGHTING FIXTURES

- A. Fixtures shall be free from any undesirable hum, vibration and/or other noises. Fixtures that are installed and are found unsatisfactory in the opinion of the Architect shall be removed and replaced at the Contractor's expense.
- B. Fixtures shall be installed in true lines and all continuous row fixtures shall be installed as recommended by the fixture manufacturer.
- C. Install lighting fixtures in accordance with code requirements.
- D. Refer to reflected ceiling plan on Architectural Drawings for the exact location of ceiling grid and lighting fixtures. Do not scale electrical drawings.

- E. All suspended fixtures shall be braced seismically to prevent swinging of fixture where such fixture will hit any obstruction if permitted to swing up 45 degrees from the vertical in any direction. Bracing shall be of a type and nature as approved by the AHJ.
- F. Provide all hanger and supports for lighting fixtures in accordance with code requirements for installation in earthquake Zone 4.
- G. Program all interior lighting automatic shut-off controls in compliance with Code and as instructed by Owner.
- H. Lamp all new fixtures with lamps of the designed rating and pattern as noted on the plans. Lamps utilized in excess of 170 hours shall be replaced with new lamps immediately before project acceptance by the owner.

3.3 CLEANING:

- A. On completion of the work, all fixtures and lenses shall be left clean. Any minor damage or scratches shall be touched up to the satisfaction of the Architect.

END OF SECTION

SECTION 26 52 00 – EMERGENCY LIGHTING**PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Emergency Lighting indoors and outdoors.

1.2 RELATED SECTIONS

- A. Section 26 27 26: Wiring Devices
- B. Section 26 51 00: Interior Light Fixtures.
- C. Section 26 50 00: Exterior Light Fixtures.

1.3 REFERENCES

- A. California Electrical Code 2016 Edition
- B. I. E. S. Lighting Standards, 10th Edition.

PART 2 PRODUCTS**2.1 LIGHTING FIXTURES WITH INTEGRAL EMERGENCY BATTERIES:**

- A. See Section 26 51 00 for description of light fixtures.
- B. Integral emergency battery shall have sufficient rating and capacity to provide emergency illumination for a period as defined in CEC Article 700.
- C. Emergency battery backup shall be as manufactured by Bodine, Iota or approved equal.

2.2 UNIT EQUIPMENT:

- A. Unit Equipment shall comply with CEC Section 700.12 (F).

2.3 REMOTE LIGHT FIXTURES:

- A. Remote light fixtures shall be powered from an emergency battery located in a “parent” light fixture or in a Central Inverter.
- B. It shall be as specified on the plans and have a voltage rating equal to that produced by the “parent” emergency battery or the Central Inverter.

2.4 EMERGENCY LIGHTING CENTRAL INVERTER/POWER SUPPLY (IPS):

- A. Provide a central, battery packed emergency Inverter/Power supply labeled “INV” on plans, for emergency egress lighting as specified here in and where shown on plans.
- B. Unit shall be as manufactured by Myers Power Products, Type “illuminator CM” or approved equal, with a capacity of 1000 Watts.
- C. Battery shall be sealed lead calcium with a battery protection circuit breaker.
- D. Provide both input and output circuit breakers.
- E. Provide enclosures for both the electronics and the battery.

PART 3 EXECUTION**3.1 GENERAL**

- A. See Section 26 05 00 for Basic Execution Methods
- B. See Section 26 51 00

3.2 INSTALLATION

- A. Install emergency light fixtures per CBC Section 1006.
- B. Wire and install Unit Equipment per CEC Section 700-12(F).
- C. For switched light fixtures with integral battery, which also serve as emergency egress lighting, an unswitched hot wire shall be provided to each such fixtures in addition to the switched wire. This hot wire shall be from the same circuit that is feeding to the switched wire.
- D. Unit shall be so connected that the lights powered by the unit shall come on automatically upon power failure to these lights, irrespective of whether the lights are "on" or "off". These lights are also required to be used as general lights switched "on" and "off" from a wall switch.
- E. Unit shall be so connected that the lights powered by the unit shall come on automatically upon power failure to these lights, irrespective of whether the lights are "on" or "off". These lights are also required to be used as general lights switched "on" and "off" from all wall switch.

END OF SECTION

SECTION 26 53 00 – EXIT SIGNS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Exit Signs.

1.2 RELATED SECTIONS

- A. Section 26 51 00: Interior Lighting

1.3 REFERENCES

- A. California Electrical Code 2016 Edition

PART 2 PRODUCTS

2.1 EXIT SIGNS

- A. Units shall be as designated in the Lighting fixture schedule on the drawings. All fixtures shall bear the Underwriters' Laboratories label.
- B. Units shall have internal emergency backup battery with integral charger where so called out on the plans. Battery shall be sized minimum per Code.
- C. Exit sign units which are required to power remote light units shall have their batteries sized for the additional remote light fixture wattages.
- D. Fixtures shall be complete with all fitting, accessories, and supports necessary for a complete and operable installation.
- E. EXIT fixtures shall be unswitched.
- F. Exit signs shall comply with and be installed per CBC Section 1011.

2.3 LAMPS:

- A. Shall be L.E.D.

PART 3 EXECUTION

3.1 INSTALLATION OF EXIT SIGNS

- A. Install signs in accordance with code requirements. Electrical Contractor shall re-verify placement of all exit signs as to ensure that they are clearly visible from any direction of approach within the path of exit travel to and within exits inside the Building. This verification shall be carried out at rough in stage. They shall be located as necessary to clearly indicate the direction of egress travel. No point in the exit path shall be more than 100 ft. from the nearest visible sign. All in accordance with CBC Section 1011.1. Relocate and/or add exit signs as necessary to achieve this. Provide pendants to mount signs as necessary to achieve this.
- B. Refer to reflected ceiling plan on Architectural Drawings for the exact location of ceiling grid and exit signs. Do not scale electrical drawings.
- C. All suspended units shall be braced seismically to prevent swinging of sign where such sign will hit any obstruction if permitted to swing up 45 degrees from the vertical in any direction. Bracing shall be of a type and nature as approved by the AHJ.
- D. Provides all hanger and supports for exit signs in accordance with code requirements for installation in earthquake Zone 4.

- E. Exit signs shall be equal in design, quality, utility, material and workmanship to those specified and shall have been tested and approved by all necessary authorities and agencies before being submitted for approval.

3.2 CLEANING:

- A. On completion of the work, all signs shall be left clean. Any minor damage or scratches shall be touched up to the satisfaction of the Architect.

END OF SECTION

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, administrative 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- μ m Core Diameter/125- μ m Cladding Diameter Class 1a 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 – TDM, Building Industries Consulting Services International, Telecommunications Distribution Methods Manual (TDM)
- 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 REQUIREMENTS

- 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 802.3an 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 craftsman.
 - 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** (sloped with (2) modules)
 - d. CFFPL4** (flat with label (4) modules)
 - e. CFFPLA4** (sloped 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.2 Category 6A and IEC/ISO 11801 Class 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 jacketed 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. MULTIMODE 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 μ m 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™ 50/125 μ m (laser optimized) simplex P/N: FLCSMCXAQY
 - b. Panduit LC OptiCam® Pre-Polished Fiber Optic Connectors OS2 Singlemode / 10Gig™ 9 /125 μ m (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, F92ERQNNQNSNM002

- 2) Panduit LC-LC MM OM4 duplex jumper, FZ2ERQNNQNSNM002

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 / Wiring 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. ($4 \times .3 = 1.2$ 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 burrs 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 1/4" 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 $\frac{3}{4}$ " 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 $L_a + L_b$). 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 MANUFACTURER 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

GENERAL

1.1 SUMMARY:

- A. Provide and install sand-set brick pavers for pedestrian traffic as described on the Drawings and specified herein. Scope includes delivery of brick pavers to, and pick-up from, Owner's vendor for engraving.

1.2 GENERAL REQUIREMENTS:

- A. This Section shall be performed in accordance with the General Conditions, Supplementary Conditions and all Sections in Division 1 of these Specifications. These documents must be read with the other Contract Documents and Sections as a whole to complete the intent of the contract.

1.3 SUBMITTALS:

- A. Make submittals to the Architect in accordance with the provisions of Section 01 33 23 of these specifications.
 - 1. Submit for architect's approval a test report and certificate of conformance for each type and color of brick specified on the Contract Documents.
 - 2. Test reports shall include:
 - a. Compressive strength
 - b. Modulus of Rupture
 - c. 24 hour cold water absorption
 - d. 5 hour boil
 - e. Saturation coefficient
 - f. Initial rate of absorption
 - g. Efflorescence
 - h. Weather classification
 - i. Paver type
 - 3. Certificate of conformance shall state that brick meet or exceed applicable ASTM specifications indicated therein.
- B. Samples and Sample Panel
 - 1. Submit no fewer than five (5) full brick samples as specified. Architect will use samples to confirm color/texture selection, and samples will be tested for engraving by Owner's vendor.
 - 2. A 4'x 4' sample panel shall be set up at the job site showing the proposed color range, texture, bond, and workmanship.
 - 3. Brick for final installation shall not be shipped from the manufacturer to the site until architect's acceptance of the sample panel.

1.4 DELIVERY

- A. Contractor shall be responsible for delivering 66% of the bricks to be installed to the Owner's vendor for engraving prior to installation.
 - 1. Owner's vendor: Cache Creek Monuments, 339 County Road 98, Woodland, CA 95695. (530) 662-4450.

- B. Bricks shall be delivered to the Owner's vendor no later than three weeks prior to scheduled installation of brick pavers at the jobsite.
- C. Contractor shall be responsible for picking up engraved bricks from the Owner's vendor and returning them to the jobsite for installation.

PRODUCTS

2.1 MANUFACTURER

- A. All brick pavers shown on the Contract Documents shall be Wire-cut True Paver, Dusty Rose, as manufactured by H.C. Muddox, 4875 Bradshaw Road, Sacramento, CA 95827-9727, or equal.
 - 1. Maximum permissible variation on length: 1/8"
 - 2. Maximum permissible variation on width and height: 1/16"
- B. Light Traffic brick shall conform to ASTM C902 Class SX, Type 1.
 - 1. Minimum compressive strength: 8000 psi
 - 2. Maximum cold water absorption: 8%
 - 3. Maximum saturation coefficient: 0.78
 - 4. Maximum abrasion index: 0.11

2.2 BEDDING AND JOINTING SAND

- A. Bedding sand should be washed free from deleterious or foreign materials, well graded, angular, concrete sand conforming to ASTM C33 with a 3/16 inch maximum aggregate size.
- B. Joint Sand Stabilizer: use SUREBOND Joint Stabilizer, or equal.

2.3 GRAVEL

- A. Gravel base materials for pedestrian and light vehicular traffic should be well graded conforming to ASTM D2940

2.4 GEOTEXTILE FILTER

- A. Mirafi 700X geotextile fabric below sand bed to control fine sands from migrating into subgrade.

2.5 EDGE RESTRAINT

- A. Cast-in-place concrete mow band per plans.

EXECUTION

3.1 INSTALLATION – FLEXIBLE PAVEMENTS

- A. Install all utilities, pipes, and subsurface drainage prior to installing the base or subbase. Unsuitable, unstable materials should be removed and replaced with suitable materials.
- B. Spread and compact base materials in uniform layers not exceeding 4 inches. Compact to 95% maximum density.
- C. Place geotextile fabric in accordance with manufacturer's instructions.
- D. Place and screed the bedding sand to the specified contours. Bedding sand should not be used to fill large voids in the base course.

- E. Install brick pavers in the pattern indicated on the Drawings.
- F. Compact the surface of the brick using a mechanical plate vibrator. After the initial compaction, sweep fine jointing sand over the surface of the brick and recompact.
- G. Remove surplus jointing sand.

3.2 CLEANING

- A. Clean brick pavement using mild detergents and the 'bucket and brush' method recommended by BIA Technical Note #20R.

END OF SECTION 32 14 16

SECTION 32 15 40

DECOMPOSED GRANITE PAVING

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Section includes: Decomposed granite paving.

1.02 SUBMITTALS

- A. Submit the following in accordance with SECTION 01 33 00 – SUBMITTAL PROCEDURES

1. Product data for decomposed granite and herbicide.
2. Samples: Half (1/2) a pound for each size and color range of decomposed granite.
3. Mock-up: Three foot by three-foot sample, full depth to match finish condition.

1.03 QUALITY ASSURANCE

- A. Qualifications: Submit certified documentation of successful experience of no less than three (3) years in the installation of similar crushed stone paving.
- B. Performance standards: Compaction in accordance with ASTM D 1557.

PART 2 – PRODUCTS

2.01 DECOMPOSED GRANITE:

- A. 1/4" minus aggregate surface:

	<u>Screen size</u>	<u>Passing</u>
	3/8"	100
(a)	No. 4	95-100
(b)	No. 8	75-80
(c)	No. 16	55-65
(d)	No. 30	40-50
(e)	No. 50	25-35
(f)	No. 100	20-25
(g)	No. 200	5-15

- B. Color: "Granite Gold" as distributed by:

1. C L Smith Trucking
37763 State Highway 16
Woodland, CA 95695-2845
(530) 662-2633

or approved equal.

2.02 STABILIZER:

- A. Non-toxic organic binder that is a colorless, odorless concentrated powder that naturally binds Crushed Aggregate Screenings (CAS) to produce a firm surface,

B. Manufactured by:

1. Stabilizer Solutions
33 S 28th Street
Phoenix, AZ 85034
602.225.5900
info@stabilizersolutions.com

or approved equal

2.03 WATER:

- A. Clean, fresh, potable water.

PART 3 - EXECUTION

3.01 GENERAL

- A. After completion of soil sterilization, compact sub-grade to minimum 90% compaction or as otherwise noted in soils report.

3.02 STABILIZED DECOMPOSED GRANITE PAVING:

- A. Sub-grades shall be rough graded to within 0.1 ft. of finish grade less depth of decomposed granite paving.

B. Lines and levels:

1. Install in maximum 2" lifts.
2. Provide a finished surface uniform in texture and appearance. Do not permit finished work to vary more than 1/8" in 10 ft. from true profile and cross section.

C. Mixing:

1. Paving shall consist of a mixture of decomposed granite, stabilizer and water, using batch-type equipment with revolving blades or drum. Mix at a rate of 8 lbs. of stabilizer per ton of crushed aggregate screenings.
2. Adjust quantity of water added to the mixture to permit maximum compaction of the materials when placed on the sub-grade. Moisture shall permeate full depth. After water application test with a minimum of one core sample per 1,000 sq. ft.; repair sample area to match adjacent section.
3. The stabilizer shall be mixed for a minimum of 15 minutes at the rate noted, using a truck mounted mixer or portable mixer. Mixing stabilizer by rototilling is not acceptable.

- D. Compacting: Thoroughly compact each lift to a minimum 90 percent with a 5 ton roller. Compact each area with at least 4 passes of the compacting equipment. After compacting, screed smooth. Do not use a wacker or vibratory roller to compact the D.G.

- E. Grading: When surface areas have been rolled and it becomes necessary to add a thin layer of material to bring the surface to grade, the previously rolled or compacted area shall be raked to provide a bond with the added material.

- F. Finish paving surface: Provide a uniform texture and color and without a cement mortar film on the exposed surface. Finish surface shall not vary more than 0.02 foot from the lower edges when measured with a 19-foot straight edge.
- G. Curing: After installation, keep moist for a period of seven days. Apply water in a fine mist or spray and in such a manner that it will not damage the finished surface.
- H. Damaged or defective installation: Repair and replace in accordance with these Specifications at no additional cost to the Owner.
- I. If compression tests of samples fail to meet specified compressive strength, immediately remove and replace decomposed granite paving with material conforming to this Specification at not cost to Owner.
- J. For each lift, have the testing laboratory verify the degree of compaction at no cost to Owner. Recompact field areas until specified compaction is achieved.

END OF SECTION 32 15 40

PART 1 - GENERAL

1.01 CONDITIONS

- A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements apply to the work specified in this Section.

1.02 SCOPE OF WORK

- A. Furnish all labor, materials, and equipment necessary to complete the irrigation system work as indicated on the Contract Documents and specified herein.
- B. Test the entire irrigation system to assure proper operation.

1.03 QUALITY ASSURANCE & REQUIREMENTS

- A. The Contractor shall obtain and pay for any and all permits, fees and all observations as required.
- B. The manufacturers' directions and the Contract Documents shall be followed. In any and all cases where the manufacturer of an article used in this Contract furnishes directions covering points not shown in the Contract Documents or Specifications, the manufacturer's directions shall be followed.
- C. Ordinances and Regulations
 - 1. All local, municipal and state laws, and rules and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these Specifications and their provisions shall be carried out by the Contractor. Anything contained in these Specifications shall not be construed to conflict with any of the above rules and regulations or requirements of the same. However, when these Specifications and Contract Documents call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by the above rules and regulations, the provisions of the Specifications and Contract Documents shall take precedence.
 - 2. The materials and work of this section shall conform to all applicable provisions of the latest editions of the California Plumbing Code, the National Electrical Code, and all codes properly governing the materials and work at the project site.
 - 3. All electrical materials and work shall conform to California Code of Regulations, Title 24.
 - 4. Work referenced in this section shall comply with the Owner or Local Agency Standards for water meters and backflow preventers.
 - 5. A Certificate of Completion is required per the California Model Water Efficient Landscape Ordinance (MWELO), §492.9, upon the completion of the installation of all landscape improvements.
 - a. An inspection (inspections) by the signer of the landscape design plan, signer of the irrigation plans, or the licensed landscape contractor to verify the installation has been completed per the plans (MWELO §492.9.a.1.E.2). Items noted for correction shall be completed by the Contractor, at no additional cost.
 - b. An irrigation inspection, audit, and audit report is required upon the completion of the installation of all landscape improvements, and must be submitted with the Certificate of Completion (MWELO §492.12). Fee for the first audit is a part of this Contract. If

additional audits are required due to improper installation, the Contactor will be responsible for any additional audit fees.

- c. All landscape irrigation audits shall be conducted by a local agency landscape irrigation auditor or third-party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape. (MWELO §492.12.a.)

D. Explanation of Contract Documents

1. All offsets, fittings, sleeves, etc., which may be required are not indicated. Carefully investigate the structural and finish conditions affecting all of the work and plan the work accordingly furnishing such fittings; etc., as may be required to meet such conditions. Contract Documents are generally diagrammatic and indicative of the work to be installed. Due to the scale of the Contract Documents, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required to complete the irrigation system.
2. Before proceeding with any work, the Contractor shall check and verify all dimensions and quantities and shall immediately inform the Owner's Representative of any discrepancy between the drawing and/or the Specifications and actual conditions. No work shall be done in any area where there is such a discrepancy until written approval for the same has been given by the Owner's Representative. The Contractor shall assume full responsibility for work installed without approval.
3. The materials and work shall be installed in such a manner as to avoid conflicts between irrigation system and planting, existing or proposed utilities, and all other construction features.
4. Contractor shall verify prior to and during construction, that his contract documents reflect the latest revisions, change orders, and plan checks. Contractor shall be able to produce such documents at the request of the Owner's Representative at any time during construction.
5. Pipe sizes indicated on the Contract Documents are minimum allowable.

1.04 EXISTING CONDITIONS

- A. Contractor shall verify locations of all existing utilities, whether shown on plans or not. The Contractor shall notify members of C.G.A two (2) working days in advance of performing any excavation work by calling the toll-free number 811.
- B. Information on the Contract Documents relative to existing conditions is approximate only. Deviations found necessary during construction to conform to actual conditions, as approved by the Owner's Representative, shall be made without additional cost.
- C. Exercise extreme care in excavating and working near existing utilities. Contractor shall be responsible for damages to existing utilities, which are caused by his operation or neglect and shall pay all costs to repair or replace utilities damaged by his work.
- D. Where it is necessary to excavate adjacent to an existing tree, the Contractor shall use all possible care to avoid injury to trees and tree roots. Excavation in areas where two (2) inch and larger roots occur shall be done by hand. All roots two (2) inches in diameter, except directly in the path of a pipe conduit, shall be tunneled under and shall be heavily wrapped with burlap to prevent scarring or excessive drying. Where a ditching machine is run close to trees having roots smaller than two (2) inches in diameter, the wall of the trench adjacent to the tree shall be hand-trimmed, making clean cuts through. Trenches adjacent to trees should be closed within 24 hours, and where this is not possible, the side of the trench

adjacent to the tree shall be kept shaded with burlap or canvas. In case of damage to existing trees, the Contractor shall forfeit an amount in proportion to extent of damage determined by the Owner, which amount shall not exceed \$10,000 per tree total loss.

1.05 SUBMITTALS

A. Material List

1. Contractor shall furnish the articles, equipment, materials, or processes specified by name in the Contract Documents and Specifications, prior to ordering or performing any work.
2. Refer to specifications section 01 33 00 Submittal Procedures for the format and quantity of the submittal, and the submittal procedure.
3. Equipment or materials installed or furnished without prior approval of the Owner's Representative shall be rejected and the Contractor required to remove such materials from the site at his own expense.
4. Approval of any item, alternate or substitute indicates only that the product or products apparently meet the requirements of the Contract Documents and Specifications on the basis of the information or samples submitted. The Contractor shall assume full responsibility (in written form) for the performance of any substitutions. The Owner's Representative's decision for approval or rejection of any substitution is final.

A. As-Built/Record Contract Documents

1. The Contractor shall be responsible for preparing As-Built Contract Documents.
2. The Contractor shall dimension from two (2) permanent points of reference, building corners, sidewalk, or road intersections, etc., the location of the following irrigation items:
 - a. Controller(s) location(s).
 - b. Controller(s) connection(s) to existing electrical power.
 - c. Connection(s) to existing water lines /(Point of Connection, POC).
 - d. Routing of irrigation pressure lines and irrigation control wiring (dimensions each 100' or less along routing).
 - e. Water line sleeves and wire conduit.
 - f. Water meter and backflow preventer.
 - g. Master valve(s) and flow sensor(s).
 - h. Gate valves.
 - i. Quick-coupling valves.
 - j. Irrigation control valves.
 - k. Other related equipment as directed by the Owner's Representative.
3. On or before the date of the final observation, the Contractor shall deliver the corrected and completed As-Built Contract Documents to the Owner's Representative. Delivery of the As-Built Contract Documents shall not relieve the Contractor of the responsibility of furnishing required information that may be omitted from the As-Built Contract Documents.

B. Controller Charts

1. As-Built Contract Documents shall be approved by the Owner's Representative before controller charts are prepared.
2. Provide one (1) controller chart for each controller supplied.

3. The chart shall show by using a different color, the area controlled by each remote control valve. Chart shall be the maximum size, which the controller door will allow.
4. The chart shall be a reduced drawing of the actual record drawing system. In the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a size that is readable.
5. When completed and approved, the chart shall be hermetically sealed between two (2) pieces of plastic, each piece being a minimum ten (10) mils thick.
6. These charts shall be completed and approved prior to final observation of the irrigation system.

C. Operation and Maintenance Manuals

1. Prepare and deliver two (2) operation manuals as specified and as follows:
 - a. Catalog and parts sheets on every material and equipment installed under this contract.
 - b. Guarantee statement.
 - c. Complete operating and maintenance instructions on all major equipment.
2. In addition to the above-mentioned maintenance manuals, provide evidence in writing to the Owner's Representative at the conclusion of the project that the above services have been rendered.

D. Equipment to be Furnished

1. Supply as a part of this Contract the following tools:
 - a. Two (2) sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project.
 - b. Two (2) five (5) foot valve keys for operation of gate valves.
 - c. Two (2) keys for each automatic controller.
 - d. Two (2) quick coupler keys and matching hose swivels for each type of quick coupling valve installed.
 - e. Two (2) Sprinklers (with complete set of nozzles) of each type specified.
 - f. Two (2) valve box keys.
2. The above-mentioned equipment shall be turned over to the Owner at the conclusion of the project. Before final observation can occur, written evidence that the owner has received material must be provided to the Owner's Representative.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Handling of PVC Pipe and Fittings: The Contractor is cautioned to exercise care in handling, loading, unloading, and storing of PVC pipe and fittings. All PVC pipe shall be transported in a vehicle which allows the length of pipe to lie flat so as not to subject it to undue bending or concentrated external load at any point. Any section of pipe that has been dented or damaged will be discarded and if installed replaced with new.

1.07 GUARANTEE

- A. The guarantee for the irrigation system shall be made in accordance with the form shown in this document. A copy of the guarantee form shall be included in the operations and maintenance manual. The guarantee form shall be re-typed onto the Contractor's letterhead and contain the following information:

GUARANTEE FOR 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 Contract Documents and Specifications, ordinary wear and tear and unusual abuse or neglect excepted. We agree to repair or replace any defects in material or workmanship which may develop during the period of one (1) year from date of final acceptance and also to repair or replace with originally specified materials. Any damage resulting from the repairing or replacing of such defects will be repaired at no additional cost to the Owner. We shall make such repairs or replacements within a 48 hour period, after receipt of written notice. In the event of our failure to make such repairs or replacements within said period of time after receipt of written notice from the Owner, 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: _____

FIRM NAME: _____

SIGNED BY: _____

PRINT NAME: _____

POSITION WITH FIRM: _____

ADDRESS: _____

PHONE: _____

DATE OF ACCEPTANCE: _____

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Use only new materials of brands and types noted on the Contract Documents specified herein or approved equals.
- B. Backfill Material
 - 1. Existing site material, if approved by the Owner's Representative, shall be used for backfill material. Backfill material shall be free from organic materials, large clods of earth or rocks larger than one (1) inch diameter, trash, debris, rubbish, broken cement, asphalt material, and other objectionable substances.
 - 2. Imported backfill material, if required, shall be clean soil consisting of earth, sand, sandy clay, loam, or other approved materials, with no large clods of earth or rocks larger than one (1) inch diameter.
 - 3. Sand bedding shall be a fine, granular sand material backfill containing no foreign matter larger than one-half (1/2) inch in size.
- C. Drainage Fill Material
 - 1. Drainage fill material shall be maximum three-quarter (3/4) inch washed and screened aggregate, consisting of hard and durable fragments of screened or broken stone or gravel.
- D. Irrigation Pipe Sleeving
 - 1. PVC Schedule 40 pipe 2 times the diameter of pipe being sleeved.
- E. PVC Pressure Main Line Pipe and Fittings.
 - 1. Pressure main line piping for sizes one-and one-half (1-1/2) inch and smaller shall be PVC Schedule 40 with solvent-welded joints.
 - a. Pipe shall be made from NSF approved Type I, Grade I, PVC compound conforming to ASTM resin specification D1785. All pipe shall meet requirements set forth in Federal Specification PS-21-70. (Solvent-weld Pipe).
 - 2. Pressure main line piping for sizes two (2) inches through four (4) inches shall be PVC Class 315 with solvent weld joints.
 - a. Pipe shall be made from an NSF (National Sanitation Foundation) approved Type I, Grade I, PVC compound conforming to ASTM resin specification D1784. All pipe shall meet requirements as set forth in Federal Specification PS-22-70, with an appropriate standard dimension ratio (S.D.R./ (Solvent-weld Pipe).
 - 3. PVC solvent-weld fittings shall be Schedule 40, NSF approved conforming to ASTM D2466.
 - 4. Solvent cement and primer for PVC solvent-weld pipe and fittings shall be of the type and installation methods specified by the manufacturers for each type of pipe.
 - 5. All PVC pipe shall be marked continuously and permanently with the following information: Manufacturer's name, nominal pipe size, schedule or class of pipe, pressure rating in P.S.I. extrusion, NSF approval and date of extrusion.

6. All fittings shall bear the manufacturer's name or trademark, material designation, size, applicable I.P.S. schedule and NSF seal of approval.

F. PVC Non-Pressure Lateral Line Piping

1. Non-pressure buried lateral line piping shall be PVC Class 200 with solvent-weld joints.
 - a. Pipe shall be made from NSF approved, Type I, Grade II, PVC compound conforming to ASTM resin specification D1784. All pipe shall meet requirements set forth in Federal Specification PS-22-70, with an appropriate standard dimension ratio.
2. Except as noted in paragraph 1 of Section 2.01F, all requirements for non-pressure lateral line pipe and fittings shall be the same as for solvent-weld pressure main line pipe and fittings as set forth in Section 2.01E of these Specifications.
3. All offsets shall be a minimum three-quarter (3/4) inch unless contractor receives written approval from the Owner's Representative.

G. PVC Threaded Nipples: PVC Schedule 80.

H. Automatic Controllers

1. Automatic controllers shall be of size and type shown on the Contract Documents.

I. Control Wiring

1. Connections between the automatic controllers and the electric control valves shall be made with direct burial copper wire AWG-U.F. 600-volt. Pilot wires shall be a different color wire for each automatic controller. Common wires shall be white with a different color stripe for each automatic controller. Size wire in accordance with valve manufacturer's specifications and wire chart. In no case shall wire size be less than #14.
2. All wire connections shall be made with direct-bury wire connector 3M DBR/Y-6, RainBird WC100, or approved equal.

J. Tracer Wire

1. Open-Trench Installation: direct burial #12 AWG Solid (0.0808" diameter), copper-clad steel core soft drawn tracer wire, 250# average tensile break load, 30 mil high molecular-high density polyethylene jacket complying with ASTM-D-1248, 30 Conductive Trace Wire for Nonmetallic Pipe Installation. Color shall be "blue" for domestic water (potable) pipelines and "purple" for raw water (non-potable) pipelines. Manufactured by Copperhead Industries part number 1230-SF, or approved equal.

K. Control Wire Conduit

1. Gray PVC Schedule 40 electrical conduit ASTM F-512 size as required.

L. Electric Remote Control Valves

1. All electric remote control valves shall be of the same type, manufacturer and sizes as indicated on the Contract Documents and/or as specified herein or approved by the Owner's Representative.
2. All remote control valves shall have a manual flow adjustment.

M. Electric Remote Control Valve Boxes

1. Valve Box shall be Old Castle Infrastructure Carson Spec Grade Model #1220, 12" x 20" rectangular plastic valve box with bolt down green cover.

N. Sprinklers

1. All sprinklers shall be of the same size, type and deliver the same rate of precipitation with the diameter (or radius) of throw, pressure, and discharge as shown on the plans and/or specified herein, or approved by the Owner's Representative.
2. Sprinklers shall have a screw radius adjustment.

O. Backflow Prevention Units

1. Backflow prevention units shall be of size and type indicated on the irrigation Contract Documents.
2. Backflow prevention device shall meet the performance Specifications of AWWA, ASSE, IAMPO, the USC Foundation for Cross Connection Control, Public Health Officials and Sanitary Engineers.
3. Contractor shall provide, as part of the contract, a weatherproof commercial insulation bag, green color, of an appropriate size for the specified unit.

P. Brass Pipe and Fittings

1. Where indicated on the Contract Documents, use red brass threaded pipe conforming to Federal Specification WW-P-351.
2. Fittings shall be red brass conforming to Federal Specification WW-P-460.

Q. Gate Valves

1. Gate valves 2-1/2-inch and smaller shall be bronze with threaded ends and be 200 WOG and equipped with a bronze hand wheel, screw-in bonnet non-rising stem and solid wedge disc.
2. Gate valves 3-inch and greater in size shall be Class 125 iron body with bronze trim and flanged ends. Non-rising stem shall have a square operating unit.

R. Gate Valve Box

1. Gate Valve Box shall be Old Castle Infrastructure Carson Spec Grade Model #1220, 12" x 20" rectangular plastic valve box with bolt down green cover.

S. Quick Coupling Valves

1. Quick coupling valves shall have a brass two-piece body designed for working pressure of 125 P.S.I. operable with quick coupler. Key size and type shall be as shown on the Contract Documents.

T. Quick Coupling Valve Box

1. Quick coupling valve box shall be Old Castle Infrastructure Carson Spec Grade Model #910, 10" round plastic valve box with bolt down green cover or approved equal. Install extension if required.

U. ADV (Anti-drain valves) / Check Valves

1. Anti-drain valves shall be of heavy-duty virgin PVC construction with F.I.P. thread inlet and outlet. Internal parts shall be stainless steel and neoprene. Anti-drain valves shall be field adjustable against drainout from 5' to 40' of head. The anti-drain valve shall be similar to the Valcon ADV or approved equal.
2. Sprinkler heads with internal check valves shall be installed to eliminate low head drainage.

V. Drip Equipment, In-line

1. The emitter line shall be polyethylene and have an in-line, pre-installed drip emitter every eighteen (18") inches. Each emitter shall be individually pressure compensating, self flushing and have a discharge rate of 0.92 gallons per hour.
2. Filter shall be a disc type with a minimum 140 mesh filtration.
3. Manual flush valve shall be a hydraulic type, normally open valve allowing for manual flushing as required to clear the lines as needed.

W. Master Valve

1. Master valves shall be normally closed with a 24 V solenoid with size and type as shown on the Contract Documents.

X. Master Valve Box

1. Master Valve Box shall be Old Castle Infrastructure Carson Spec Grade Model #1220, 12" x 20" rectangular plastic valve box with bolt down green cover or approved equal. Install extension if required.

B. Flow sensor shall be an insertion type with a nonmagnetic spinning impeller (paddle wheel) as the only moving part. The sensor shall operate in flow of one (1) foot per second up to thirty (30') feet per second. The sensor shall be as specified on the Plan.

1. Flow sensor cable shall be constructed of 20 AWG or larger copper conductors twisted into pairs of verifying lengths to prevent crosstalk. Conductors shall be insulated with Polyethylene or Propylene with a suggested working voltage of 350 volts. The cable shall feature an aluminum-polyester shield and be finished with high density Polyethylene Jacket. The cable should be equivalent to Manhattan type M390109.
2. Flow sensor cable connections shall be made with direct-bury wire connector 3M DBR/Y-6, Rainbird DBRY, or approved equal.

C. Flow Sensor Box

1. Flow Sensor Box shall be Old Castle Infrastructure Carson Spec Grade Model #1220, 12" x 20" rectangular plastic valve box with bolt down green cover or approved equal. Install extension if required.

PART 3 - EXECUTION

3.01 OBSERVATION OF SITE

A. Site Conditions

1. All scaled dimensions are approximate. The Contractor shall check and verify all site dimensions and notify the Owner's Representative if site conditions have changed.
2. The Contractor shall carefully check all grades to satisfy him that he may safely proceed before starting work on the irrigation system.

3.02 PREPARATION

A. Physical Layout

1. Prior to installation, the Contractor shall stake out all pressure supply lines, routing and location of sprinkler heads.
2. All layouts shall be approved by the Owner's Representative prior to installation. If equipment is incorrectly located without said approval, it is the Contractor's responsibility to relocate it as per the Owner's Representative's directions without additional cost.

3.03 WATER AND ELECTRICAL SERVICES

A. Water Supply

1. Irrigation system shall be connected to water supply points of connection as indicated on the Civil Contract Documents. Field verify connection point. Contractor is responsible for any changes caused by actual site conditions. Notify Owner's Representative in writing of any discrepancies prior to beginning construction.

B. Electrical Supply

1. Contractor shall provide all materials and connections to supply electrical power for irrigation controllers and pump stations.
2. Connection shall be made at approximate location(s) as indicated on the Electrical Contract Documents. The Contractor is responsible for minor changes caused by actual site conditions and for the coordination of all electrical service connections to the controller(s).
3. All electrical work and materials shall conform to local codes, ordinances and governing authorities having jurisdiction.
4. 120-volt power connection to the automatic controller shall be provided by the Contractor. The Contractor shall provide all materials and connections to supply power to the controllers.

3.04 INSTALLATION

- A. Trenching: Dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on the Contract Documents and as noted. Provide the following minimum depths:
 1. Non-constant pressure lateral lines: twelve (12) inches cover
 2. Constant pressure main lines: eighteen (18) inches cover
 3. In-line drip emitter and polyethelene drip distribution tubing: four (4) inches cover

4. Control wiring: eighteen (18) inches cover
5. All lines and wires under auto circulation: twenty-four (24) inches of cover

B. Backfilling

1. The trenches shall not be backfilled until all required tests are performed. Trenches shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall be mechanically compacted in landscaped areas to a dry density equal to adjacent undisturbed soil in planting areas. Backfill shall conform to adjacent grades without dips, sunken areas, humps or other surface irregularities.
2. Where excavated native soil contains greater than 50% rock or other material one (1) inch diameter or larger, imported backfill or sand bedding shall be placed three (3) inches in depth around all pipes.
3. Flooding of trenches shall be permitted only with approval of the Owner's Representative.
4. If settlement occurs and subsequent adjustments in pipe, valves, sprinklers heads, lawn or planting, or other construction are necessary, the Contractor shall make all the required adjustments, at the Contractor's expense.

C. Trenching and Backfilling Under Paving

1. Trenches located under areas where paving, asphaltic concrete or concrete shall be installed, shall be backfilled with sand (a layer six (6) inches below the pipe and three (3) inches above the pipe and compacted in layers to 90% compaction, using manual or mechanical tamping devices). All trenches shall be left flush with the adjoining grade. The Contractor shall set in place, cap and pressure test all piping under paving prior to the paving work.
2. Generally piping under existing walks is done by jacking, boring or hydraulic driving, but where any cutting or breaking of sidewalks and/or concrete is necessary, it shall be done and replaced by the Contractor as part of the Contract cost. Permission to cut or break sidewalks and/or concrete shall be obtained from the Owner. No hydraulic driving shall be permitted under concrete paving.

D. Sleeving

1. Install all irrigation and/or electrical sleeving as indicated on the Contract Documents. Contractor shall coordinate the installation of sleeving with the work of other trades.

E. PVC Pipe

1. Routing of irrigation pipe as indicated on the Contract Documents is diagrammatic. Install lines and various assemblies to conform with the details shown on the Contract Documents.
2. Install no multiple assemblies on plastic lines. Provide each assembly with its own outlet.
3. Install all assemblies specified herein in accordance with respective detail. In absence of detail Contract Documents or Specifications pertaining to specific items required to complete work, perform such work in accordance with best standard practice with prior approval of the Owner's Representative.

4. PVC pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before installation. Installation and solvent welding methods shall be as recommended by the pipe and fitting manufacturer.
5. PVC pipe shall be installed so that there will be a small amount of excess length in the pipe to compensate for contraction and expansion of the pipe. This shall be accomplished by "snaking" the pipe in the trench during installation.
6. On PVC to metal connections, the Contractor shall work the metal connections first. Teflon tape or approved equal shall be used on all threaded PVC to PVC, and on all threaded PVC to metal joints. Light wrench pressure is all that is required. Where threaded PVC connections are required, use threaded PVC adapters into which the pipe may be welded.
7. In changing pipe depth, 45° elbows shall be used.
8. Install tracer wire on top of mainline. Solder all splices.

F. Line Clearance

1. All lines shall have a minimum clearance of three (3) inches from each other and from lines of other trades. Parallel lines shall not be installed directly over one another.

G. Automatic Controller

1. Install as per the irrigation details and manufacturer's specifications.
2. Controller shall be securely mounted in the location as indicated on the Contract Documents or approved by the Owner's Representative in such a manner that all normal operations can be conveniently made by the operator.
3. The Contractor shall properly ground the controllers in accordance with local codes.
4. The Contractor shall take all control wires to the controller and make all required connections for their installation.
5. All electrical and control wires installed above ground shall be placed in metal conduit or other approved materials and securely mounted. Paint conduit as per the Owner's Representative's directions and/or as indicated on the Contract Documents.

H. Control Wiring

1. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible.
2. Where more than one (1) wire is placed in a trench, the wiring shall be taped together at intervals of ten (10) feet.
3. An expansion curl shall be provided within three (3) feet of each wire connection. Expansion curl shall be of 18 inches in length at each splice connection and at each electric control, so that in case of repair, the valve bonnet may be brought to the surface without disconnection of the control wires. Control wires shall be laid loosely in trench without stress or stretching of control wire conductors.
4. All control wire spliced shall be completely waterproof.

5. Use one splice per connector sealing pack.

I. Electric Remote Control Valves

1. Install as per the irrigation details and manufacturer's specifications.
2. Install where shown on Contract Documents. Locate valve boxes 12 inches from walk, curb, headerboard, etc., for easy access. Boxes shall be uniformly aligned and oriented relative to hardscape.
3. Install one (1) remote control valves per valve box. Provide extension units as required. Install valve boxes in shrub planting areas whenever possible.
4. Provide eighteen (18) inch expansion loop at all electrical connections within control valve boxes.

J. Flushing of System

1. After new irrigation pipe lines and risers are in place and connected, all necessary diversion work is complete, and prior to installation of irrigation heads, the control valves shall be opened and a full head of water shall be used to flush out the system.

K. Sprinklers

1. Install the sprinklers as detailed on the Contract Documents. Irrigation sprinklers to be installed in this work shall be as per approved submittals.
2. Spacing of sprinklers shall not exceed the maximum indicated on the Contract Documents. In no case shall the spacing exceed the maximum recommended by the manufacturer.
3. Contractor shall install turf sprinklers where adjacent to fixed objects such as headerboards, curbs, or mowing strips, so that power edging tools can pass between the turf sprinkler and the fixed object without difficulty.
4. Riser units shall be fabricated in accordance with the irrigation details.
5. Riser nipples for all sprinklers shall be the same size as the riser opening in the sprinkler body.
6. Install sprinklers with internal check valves as required to eliminate low head drainage.

L. Backflow Preventer

1. Install backflow prevention assemblies as detailed on the Contract Documents and as per all applicable local governing codes and ordinances.
2. Do not locate assemblies in turf areas. Assemblies shall be screened with plant materials, as indicated on the Contract Documents and as directed by the Owner's Representative.
3. Do not use PVC piping in backflow prevention assemblies.
4. Exact location of unit shall be approved by the Owner's Representative prior to installation.

5. Install on a concrete pad inside of a vandal proof enclosure.

M. Gate Valves

1. Install as per the irrigation details and manufacturer's specifications.
2. Install where shown on Contract Documents. Locate, in valve boxes, 12 inches from walk, curb, headerboard, etc., for easy access.
3. Install one gate valve per valve box. Provide extension units as required. Install valve boxes in shrub planting areas whenever possible.

N. Quick Coupling Valves

1. Install as per the irrigation details and manufacturer's specification.
2. Install where shown on Contract Documents. Locate, in valve boxes, 12 inches from walk, curb, headerboard in shrub planting areas whenever possible.
3. Install one quick coupling valve per valve box. Provide box extension units as required. Install valve boxes in shrub planting areas whenever possible.

O. ADV (Anti-Drain Valves) / Check Valves

1. Prior to installation, the Contractor shall verify the on-site grades.
2. If there is an elevation difference of 24" or more between the highest head and lowest head on a system, the ADV's shall be installed on the riser.

P. Drip Equipment, In-line

1. When backfilling dripperline, only use clean backfill free of rocks, the soil is not to be wet or muddy. Dripperline to be pressurized and inspected for leaks before backfilling.
2. The filter shall be installed per the Irrigation Details and manufacturer's recommendations.
3. The flush valve shall be installed per the Irrigation Details and manufacturer's recommendations.
4. The PVC sub-mains and dripperline shall be flushed clean of dirt, rocks, etc. prior to the installation of automatic flush valves and automatic air release valves.

Q. Satellite controller equipment or approved equal.

1. Install as per the irrigation details and manufacturer's specifications.
2. Properly ground control system in accordance with local codes and manufacturer's specifications.

R. Water Meter

1. Install as per the Owner or Local Agency Specifications.

S. Master Valve

1. Install as per the irrigation details and manufacturer's specifications.

T. Flow Sensor and Output Transmitter

1. Install the sensor as per the irrigation details and manufacturer's specifications.
2. Pulse output transmitter shall be installed per the manufacturer's specifications.

3.05 TEMPORARY REPAIRS

- A. The Owner reserves the right to make temporary repairs as necessary to keep the irrigation system in operating condition. The exercise of this right shall not relieve the Contractor of his responsibilities under the terms of the guarantee as herein specified.

3.06 FIELD QUALITY CONTROL

A. Adjustment of the System

1. The Contractor shall adjust all pressure regulating devices on the remote control valves.
2. The Contractor shall flush and adjust all sprinklers for optimum performance and to prevent overspray onto walks, windows, roadways, and buildings as much as possible.
3. If it is determined that adjustments in the irrigation equipment shall provide proper and more adequate coverage, the Contractor shall make such adjustments after written approval by the Owner's Representative. Adjustments shall include changes and additions of sprinklers, nozzle size and degrees of arc as required without additional contract costs.
4. If it is determined that any irrigation equipment is improperly installed, then adjustments shall be made to conform to construction documents without additional contract costs.
5. All sprinklers shall be set perpendicular to finished grades unless otherwise designated on the Contract Documents.

B. Testing of Irrigation System

1. The Contractor shall request the presence of the Owner's Representative at least 48 hours in advance of testing.
2. Test all pressure lines under hydrostatic pressure of 125 pounds per square inch prior to installation of remote control valves. A minimum of three pressure gauges equally spaced along the main line is required.
3. Sustain pressure in lines for not less than two (2) hours. If leaks develop, replace joints and repeat test until entire system is proven watertight. At the end of the test the system shall be drained in the presence of the Owner's Representative.
4. All hydrostatic tests shall be made only in the presence of the Owner's Representative. Center load pipe in trench exposing all joints for pressure test. No pipe shall be backfilled until it has been observed, tested and approved in writing by the Owner's Representative. Should any work be covered up before such observation and tests are completed, the Contractor shall, at his own expense, uncover the work; and after it has been observed, tested and approved, he then shall make all repairs with such materials as required to restore all work disturbed to original and proper condition.

5. Furnish necessary force pump and all other test equipment. All equipment shall be present during the test.
6. The emission system shall be tested and approved by the Owner's Representative prior to backfilling any trenches. Should any work be covered up before such observation and tests are completed, the contractor shall, at his own expense, uncover the work; and after it has been observed, tested and approved, he then shall make all repairs with such materials as required to restore all work disturbed to original and proper condition.
7. When the irrigation system is completed, perform a coverage test in the presence of the Owner's Representative to determine if the water coverage for landscape areas is complete and adequate. Furnish all materials and perform all work required to correct any inadequacies of coverage due to deviations from the Contract Documents, or where the system has been willfully installed as indicated on the Contract Documents, when it is obviously inadequate. This test shall be accomplished before any landscape is planted.

3.07 MAINTENANCE

- A. Provide maintenance as per SECTION 32 98 00 - LANDSCAPE MAINTENANCE.

3.08 CLEAN-UP

- A. Clean up shall be made as each portion of work progresses. Refuse and excess dirt shall be removed from site. All walks and paving shall be broomed or washed down, and any damage sustained to the work of others shall be repaired to original conditions acceptable to the Owner and the Owner's Representative.

3.09 OBSERVATION PRIOR TO FINAL ACCEPTANCE

- A. The Contractor shall operate each system in its entirety for the Owner's Representative at time of final observation. Any items deemed not acceptable shall be reworked at no additional contract cost, to the complete satisfaction of the Owner's Representative.
- B. The Contractor shall show evidence to the Owner's Representative that the Owner has received all accessories, charts, Record Contract Documents and equipment as required before final observation can occur.

3.10 OBSERVATION SCHEDULE

- A. Normal progress observations shall be requested by the Contractor from the Owner's Representative as per observations listed in specifications SECTION 32 93 00 – LANDSCAPE INSTALLATION.
- B. No final observation shall commence without Record Contract Documents. In the event the Contractor calls for an observation without Record Contract Documents, without completing previously noted corrections or without preparing the system for observations, he shall be responsible for reimbursing the Owner's Representative at the hourly rate in effect at the time of the observation (plus transportation costs) for the inconvenience. No further observations will be scheduled until this charge has been paid.

END OF SECTION 32 84 00

SECTION 32 92 10

LANDSCAPE TURF GRASS**PART 1 – GENERAL****1.01 CONDITIONS**

- A. The general provisions of the contract, including General and Supplementary Conditions and General Requirements apply to the work specified in this section

1.02 SCOPE OF WORK

- A. Furnish all labor, material, equipment and services necessary to provide all work, complete and in place, as indicated on Contract Documents and specified herein.
- B. Work specified in this Section includes, but is not limited to the following:
 - 1. Preparation
 - 2. Weed Control
 - 3. Sodding
 - 4. Clean-up

1.03 QUALITY ASSURANCE

- A. All materials shall be of standard, approved and first-grade quality and shall be in prime condition when installed and accepted. Any commercially processed or packaged material shall be delivered to the site in the original unopened container bearing the manufacturer's guaranteed analysis. Contractor shall supply Owner's Representative with a sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance of bearing the manufacturer's guaranteed analysis.
- B. Established turfgrass areas shall exhibit a uniform stand in good health and vigor, free of noxious or invasive weeds, and demonstrating 95% coverage, effective competitiveness against non-planted species, and be of sod-like appearance at the time of final acceptance.

1.04 SUBMITTALS

- A. Refer to Section 01 33 00 – SUBMITTAL PROCEDURES for instructions.
- B. Material List
 - 1. Contractor shall furnish the articles, equipment, materials, or processes specified by name in the Contract Documents and Specifications.

2. Complete material list (one digital copy) shall be submitted prior to performing any work. Material list shall include the manufacturer, model number and description of all materials, products, and equipment to be used.
 3. Equipment or materials installed or furnished without prior approval of the Owner's Representative shall be rejected and the Contractor required to remove such materials from the site at this own expense.
 4. Approval of any item, alternate or substitute indicates only that the product or products apparently meet the requirements of the Contract Documents and Specifications on the basis of the information or samples submitted. The Contractor shall assume full responsibility (in written form) for the performance of any substitutions. The Owner's Representative and/or Owner's authorized representative's decision for approval or rejection of any substitution is final.
- C. Soils fertility analysis shall be submitted within 60 days of award of contract.
- 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING
- A. The Contractor, upon request by Owner's Representative, shall provide receipts, delivery tickets, load tickets, etc. of all items delivered to the job site to verify products and total quantities.
 - B. Deliver fertilizer and other packaged products to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name trademark, and conformance to State Law.
- 1.06 JOB CONDITIONS
- A. Install grasses after irrigation system is operable and has been accepted.
 - B. Protect work and materials from damage due to construction operations by other contractors and trades and by vandalism. Maintain protection during installation and maintenance period.
- 1.07 SAMPLES AND TESTS
- A. Owner's Representative reserves the right to take and analyze samples of materials for conformity to specifications. The Contractor shall furnish samples upon request by the Owner's Representative. Rejected materials shall be removed from the site at Contractor's expense. Cost of testing of materials not meeting specifications shall be paid by Contractor.
 - B. Agronomic Soils Testing – As per paragraph 1.07, SECTION 32 93 00 – LANDSCAPE INSTALLATION
- 1.08 GUARANTEE AND REPLACEMENT
- A. All plant material and other materials installed under the Contract shall be guaranteed against any and all poor, inadequate or inferior materials and/or

workmanship for the duration of the maintenance period. Any plant found to be dead or not in a satisfactory or healthy condition due to faulty materials, workmanship, acts of God, or improper maintenance as determined by the Owner's Representative prior to or during the maintenance period, shall be replaced immediately by the contractor at his expense.

- B. The Owner's Representative shall be the sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the Contractor within fifteen (15) days of written notification by the Owner. All replacement materials and installation shall comply with the Plans and Specification.

PART 2- PRODUCTS

2.01 MATERIALS

A. Sod

1. Sod variety shall be as specified on Contract Documents. Sod shall be healthy, weed free and obtained from a certified sod growing nursery or farm.
2. All sod shall be cut within twenty-four (24) hours prior to installation.

B. Weed Control

1. Enide (Upjohn), Dymid (Elanco Products Co.), Treflan, Eptan, Surflan or approved equal.

PART 3 - EXECUTION

3.01 OBSERVATION

- A. Prior to the work in this Section, examine previously installed work from other trades and verify that such work is complete and as required, to the point where this installation may commence properly.
- B. Contractor to review the conditions of site. Verify that final grades have been established prior to beginning planting operations. Contractor is responsible to inform Owners Authorized Representative of conditions of the site that are not suitable for work.

3.02 PREPARATION

A. General

1. As per paragraph 3.03, SECTION 32 93 00 – LANDSCAPE INSTALLATION
2. Final Grades

- a. Provide finish grading for proper drainage of the site. Conform to SECTION 31 22 19 - FINISH GRADING (or)
31 22 00 – EARTHWORK & ROUGH GRADING
- b. Establish finish grades in a continuous uniform line resulting in a uniform surface with no ridges or water pockets. Areas shall be smooth and continuous with firm planes that insure proper surface drainage.
- c. All rocks, soil lumps and deleterious materials larger than one (1) inch shall be removed and the areas raked and compacted with a two hundred (200) pound roller.
- d. The Contractor shall avoid any additional soil compaction, and shall not permit vehicular or equipment traffic over such areas. In the event of such compaction, the Contractor shall be required to recultivate any areas thus compacted.

3. Pre-plant weed control

- a. Prepared areas shall be irrigated for a period of one week, allowing existing weed seeds to germinate. All weeds shall be eradicated by application of non-selective foliar herbicide, "Roundup" or equal.

3.03 SODDING

- A. Spread turf starter fertilizer onto the soil evenly at the rate of four (4) pounds per 1,000 square feet of lawn area.
- B. Lay first strip of sod along a straight line (use a string in irregular areas). Butt joints tightly, but do not overlap edges. On second strip, stagger joints. Use a sharp knife to cut sod to fit curves, edges and irrigation heads.
- C. For sod areas over 2,000 square feet, lay a header strip of sod parallel to all edges, and butt subsequent strips into header strip.
- D. Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and to water until installation is complete.
- E. After laying all sod, roll lightly to eliminate irregularities and to form good contact between sod and soil. Avoid a very heavy roller or excessive initial watering which may cause roller marks.
- F. Water the completed lawn surface thoroughly. Soil should be moistened at least eight (8) inches deep. Repeat irrigation at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.

- G. Replace all dead or dying sod with equal material as directed by the Owner's Representative.

3.04 CLEAN UP

- A. Per Section 32 93 00 – LANDSCAPE INSTALLATION

3.05 OBSERVATION SCHEDULE

- A. Per Section 32 93 00 – LANDSCAPE INSTALLATION

3.06 MAINTENANCE

- A. Per Section 33 98 00 – LANDSCAPE MAINTENANCE

END OF SECTION

PART 1 - GENERAL

1.01 CONDITIONS

- A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements apply to the work specified in this Section.

1.02 SCOPE OF WORK

- A. Furnish all labor, material, equipment and services necessary to provide all landscape work, complete and in place, as indicated on Contract Documents and specified herein.

Work specified in this Section, but is not limited to the following:

1. Soil preparation
2. Planting
3. Sod
4. Staking
5. Clean-up

1.03 QUALITY ASSURANCE

A. Source Quality Control

1. Submit documentation to the Owner's Representative at least sixty (60) days prior to start of planting that all plant material has been ordered. Arrange procedure for observation of plant material with the Owner's Representative at time of submission.
2. Plants shall be subject to observation and approval by the Owner's Representative upon delivery for conformity to specifications. Such approval shall not impair the right of observation and rejection during progress of work.

1.04 SUBMITTALS

A. Material List

1. Contractor shall furnish the articles, equipment, materials or processes specified by name in the Contract Documents and specifications.
2. Complete material list (1 digital copy) shall be submitted prior to performing any work. Material list shall include the manufacturer, model number and description of all materials and equipment to be used.
3. Equipment or materials installed or furnished without prior approval of the Owner's Representative shall be rejected and the Contractor required to remove such materials from the site at his own expense.
4. Approval of any item, alternate or substitute indicates only that the product or products apparently meet the requirements of the Contract Documents and Specifications on the basis of the information or samples submitted. The Contractor shall assume full

responsibility (in written form) for the performance of any substitutions. The Owner's Representative's decision for approval or rejection of any substitution is final.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery

1. The Contractor, upon request by the Owner's Representative, shall provide receipts, delivery tickets, load tickets, etc. of all items delivered to the job site to verify products and total quantities.
2. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name trademark, and conformance to State Law.
3. Deliver plants with legible identification labels.
 - a. Label trees, evergreens, bundles of containers of like shrubs, or ground cover plants.
 - b. State correct plant name and size indicated on plant list.
 - c. Use durable waterproof labels with water-resistant ink which will remain legible for at least sixty (60) days.
1. Protect plant material during delivery to prevent damage to rootball or desiccation of leaves.
2. The Contractor shall notify the Owner's Representative forty-eight (48) hours in advance of delivery of all plant materials for observation.

A. Storage

1. Store plant material in shade and protect from weather.
2. Maintain and protect plant material as required.

B. Handling

1. Do not drop plant materials.
2. Do not pick up container plant material by stems or trunks.

1.06 JOB CONDITIONS

- A. Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.
- B. Install trees, shrubs, and ground cover plant material before lawn areas are installed and after irrigation system is operable.
- C. Protect work and materials from damage due to construction operations by other contractors and trades and by vandalism. Maintain protection during installation and maintenance period.

1.07 SAMPLES AND TESTS

- A. The Owner's Representative reserves the right to take and analyze samples of materials for conformity to specifications. The Contractor shall furnish samples upon request by the Owner's Representative. Rejected materials shall be removed from the site at Contractor's

expense. Cost of testing of materials not meeting specifications shall be paid by the Contractor.

B. Agronomic Soils Testing

1. To ensure a suitable growing medium for plants, employ services of a certified agronomic soils testing laboratory to perform soil testing at selective locations only on-grade. For bidding purposes there shall be a minimum of four (4) test locations. Contractor is to provide documented locations for review by Owner's Authorized Representative for approval before testing can proceed. Contractor is responsible for agronomic soil testing costs.
2. Perform soil sampling and testing once fine grading and soil amendments have been completed, and prior to turf installation.
3. Amendment recommendations based on soils testing will take precedence over soil amendments and application rates specified in this section.
4. Provide the following at each test location:
 - a. Chemical analysis report of each soil sample location to include the following:
 - i. Percentage of organic matter.
 - ii. Salinity.
 - iii. PH.
 - iv. Mineral nutrients, including concentrations of nitrogen, phosphorus, potassium, calcium, and magnesium.
 - v. Potential hazards of impediments to plant growth from salinity; sodium, boron, impaired soil structure or drainage.
 - vi. Cation-exchange
 - b. Request testing for fertility and suitability analysis with written recommendations for soil amendment application rates.
 - c. Soil percolation rates.
 - d. Percentages of sand, silt, and clay particles.

1.08 GUARANTEE AND REPLACEMENT

- A. All plant material and other materials installed under the Contract shall be guaranteed against any and all poor, inadequate or inferior materials and/or workmanship for the duration of the maintenance period. Any plant found to be dead or not in a satisfactory or healthy condition due to faulty materials, workmanship, act of God, or improper maintenance as determined by the Owner's Representative shall be replaced immediately by the Contractor at his expense.
- B. The Owner's Representative shall be the sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the Contractor within fifteen (15) days of written notification by the Owner. All replacement materials and installation shall comply to the Contract Documents and Specifications.

PART 2 - PRODUCTS

2.01 GENERAL

All materials shall be of standard, approved and first-grade quality and shall be in prime condition when installed and accepted. Any commercially processed or packaged material shall be delivered to the site in the original unopened container bearing the manufacturer's guaranteed analysis. The Contractor shall supply the Owner's Representative with a sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance of bearing the manufacturer's guaranteed analysis.

2.02 PRODUCTS

A. Soil Conditioner

1. Gro-Power Plus: Humus (bacteria included based fertilizer and soil conditioner with soil penetrant shall consist of the following percents by weight:
 - a. 5 % nitrogen
 - b. 3 % phosphoric acid
 - c. 1 % potash
 - d. 50 % humus
 - e. 15 % humic acids

B. Soil Amendment

1. Nitrogen Stabilized Shavings: 0.56 to 0.84% N based on dry weight for fir bark mulch, treated with relative form of nitrogen (NH₃), 1/2" or less in size.
 - a. Particle Size: 95% - 100% passing 6.35 mm standard sieve.
80% - 100% passing 2.33 mm standard sieve.
10% - 20% passing 0.50 mm standard sieve.
 - b. Salinity: The saturation extract conductivity shall not exceed 3.5 millimhos/centimeter at 25 degrees (25°) centigrade as determined by saturation extract method.
 - c. Iron Content: Minimum 0.08% dilute acid soluble Fe on dry weight basis.
 - d. Ash: 0 - 25% (dry weight)
 - e. pH range: 5.5 - 7.5
 - f. Actual organic matter content: minimum 280 pounds per cubic yard

C. Soil Amendment Fertilizer

1. General NPK fertilizer which contains the following percents by weight:
 - a. 6% nitrogen
 - b. 20% phosphoric acid
 - c. 20% potash

D. Planting Pit Fertilizer

1. Gro-Power Plus (bacteria included) with soil penetrant and shall consist of the following percents by weight:
 - a. 5% nitrogen
 - b. 3% phosphoric acid
 - c. 1% potash
 - d. 50% humus
 - e. 15% humic acid

2. Turf Starter Fertilizer: Shall consist of the following percents by weight:
 - a. 16% nitrogen
 - b. 20% phosphoric acid
 - c. 0% potash
 4. Planting Tablets: Slow-release 21 gram tablets as manufactured by Agriform or approved equal, containing the following percentages of nutrients by weight:
 - a. 20 % nitrogen
 - b. 10 % phosphoric acid
 - c. 5 % potash
- E. Plant Material
1. The plant material indicated on the Contract Documents by the listed names shall conform to "Standard Plant Names," second edition, except for names not covered therein, the established customs of the nursery trade is followed. All plants shall be true to name, and above one of each bundle or lot shall be tagged with the name and size of the plant, in accordance with the standards of practice recommended by the American Association of Nurserymen. All plant materials shall meet the specifications of Federal, State and County laws, requiring inspection for plant diseases and insect infestations. Plants shall be symmetrical, typical for variety and species, sound, healthy, vigorous, free from plant diseases, insect pests or other eggs, and shall have healthy, normal root systems, while filling their containers, but not to the point of being root bound. Plants with roots which encircle root balls or trunks, or which are girdling trunks, will not be accepted. Use only plant materials that are first class representative of the species and cultivars specified and that conform to all State and local laws governing the sale, transportation and inspection of plant materials. Plants shall have straight, single trunks, unless otherwise specified on the Contract Documents. Those specified to be multi-trunk shall have at least three leaders from the base. Any plants that have encircling roots (not root bound) shall have root balls lightly slashed on a minimum of three (3) sides to stop encircling root growth. The height and spread of all plant materials shall be measured with branches in their normal position. Sizes of plants shall be as stated on the plant list, 5 and 15 gallon can containers stock shall have been grown in that container not less than six (6) months, but shall not have been overgrown in the containers so as to have become root bound.
 2. The size of the plants will correspond with that normally expected for species and variety of commercially available nursery stock or as specified in the Special Conditions or Contract Documents. The minimum acceptable size of all plants, measured before pruning with the branches in normal position, shall conform with the measurements, if any, specified on the Contract Documents in the list of plants to be furnished. Plants larger in size than specified may be used with the approval of the Owner's Representative, but if the use of larger plants is approved, the ball of earth or spread of roots for each plant will be increased proportionally. Plant material shall conform to the following Specifications for container stock:

SHRUBS

SIZE	TYPE	EXAMPLE	HEIGHT	SPREAD	CALIPER
1 Gal.	Low growing	Pitt. tobira	8-10"	6-8"	
1 Gal.	Tall growing	Pitt. eugen.	10-12"	6-8"	
5 Gal.	Low growing	Pitt. tobira	15-18"	15-18"	
5 Gal.	Tall growing	Pitt. eugen.	24-30"	15-18"	
15 Gal.	Low growing	Pitt. tobira	30-36"	30-36"	
15 Gal.	Tall growing	Pitt. eugen.	42-48"	36-42"	

TREES					
SIZE	TYPE	EXAMPLE	HEIGHT	SPREAD	CALIPER
5 Gal.	Slow growing	Quercus	5-6'	12-18"	1/4 - 1/2"
5 Gal.	Fast growing	Euc. – Prunus	6-7'	12-18"	1/2 - 3/4"
15 Gal.	Slow growing	Quercus – Pyrus	7-8'	24-30"	3/4 - 1"
15 Gal.	Fast growing	Euc. – Prunus	8-10'	30-36"	1 – 1 1/4"
24" Box	Slow growing	Euc. – Prunus	8-10'	3-4'	1 1/2 - 1 3/4"
24" Box	Fast growing	Quercus – Pyrus	10-12'	4-5'	1 3/4 - 2 1/2"
30" Box	Slow growing	Quercus – Pyrus	12-14'	6-7'	2 1/2 - 3"
30" Box	Fast growing	Euc. – Prunus	12-14'	6-7'	2 1/2 - 3"
36" Box	Slow growing	Quercus – Pyrus	14-16'	8-10'	2 1/2 - 3"
36" Box	Fast growing	Euc. – Prunus	14-16'	8-10'	2 1/2 - 3"

3. Plants not conforming to the requirements shall be considered defective and such plants, whether in place or not, shall be marked as rejected and immediately removed from the site of the work and replaced with new plants at the Contractor's expense. Plants shall be of the species, variety, size and condition specified herein or as shown on the Contract Documents. Under no conditions will there be any substitution of plants or sizes listed on the plans, except with the expressed written approval of the Owner's Representative.
 4. The central leaders of all specified trees shall remain intact. Any tree which has had its central leader cut or removed is subject to rejection.
 5. At no time shall trees or plant materials be pruned, trimmed or topped prior to delivery and any alteration of their shape shall be conducted only with the approval and when in the presence of the Owner's Representative and/or as noted on the Planting Specifications.
 6. Nursery Grown and Collected Stock
 - a. Plant materials shall conform to the best edition of ANSI Z60.1 American Standard for Nursery Stock.
 - b. Grown under climatic conditions similar to those in locality of project.
 - c. Container-grown stock in vigorous, healthy condition, not root bound or with root system hardened off.
 - d. Use only linear stock plant material which is well established in removable containers or formed homogeneous soil sections.
 7. Ground cover plants shall be grown in 1 gallon containers, flats or liners, as indicated on the plans. Flat grown plants (rooted cuttings) shall remain in those flats until transplanting. The flat's soil shall contain sufficient moisture so that it will not fall apart when lifting the plants.
- F. Tree Staking Material
1. Stakes for Tree Support
 - a. Wood Tree Stakes: Lodgepole pine stakes. Minimum nominal size: two inches in diameter x length as required and pointed at one (1) end (adjust length to fit tree). Stakes shall be free from knots, checks, splits, or disfigurements.
 2. Ties
 - a. 24" length cinch tie as manufactured by V.I.T. Company (714) 871-2309 or approved equal.

G. Mulch

1. Mulch shall be walk-on fir bark mulch as manufactured by Redi-Gro Corporation, Sacramento, California (916) 381-6063 or approved equal.
2. The mulch shall consist of fibrous, woody bark mixture of varied particle size such that maximum particle length be 3".

a. Physical properties:	<u>Percent Passing</u>	<u>Sieve Size</u>
	90-100	1" (25.4 mm) Dia.
	80-100	1/2" (12.7 mm) Dia.
	20-60	1/4" (6.35 mm) Dia.

b. Chemistry:

- 1) Acid in reaction, max pH 5.0
- 2) Maximum ash 7% based on dry weight.
- 3) Minimum moisture 35% at time of delivery based on fresh weight.

H. Steel Header

1. 3/16" x 4" galvanized steel.
2. Stakes shall be 3/16" x 15" steel.

As distributed by:

- a. Border Concepts
Green Land Supply
826 S La Brea Ave.
Inglewood CA, 90301
(310) 695-9990 **(or)** approved equal

I. Boulders

1. Moss Rocks / Field Stones, Sizes to vary, refer to construction Documents. Minimum size shall be 2 1/2" dia. up to 48"
2. Boulders shall be grouped with varying sizes. Groupings shall be approved by Owner's Representative prior to installation.

3. available from:

- b. C L Smith Trucking
37763 State Highway 16
Woodland, CA 95695-2845

(or) approved equal

J. Weed Control

1. Enide (Upjohn), Dymid (Elanco Products Co.), Treflan, Eptan, Surflan or approved equal.

K. Root Barriers

1. The root control barrier shall be an injection molded or extruded modular component made of high density polypropylene or polyethylene plastic.
2. Panels shall measure 24" in width with a depth of 24" unless otherwise specified, with a mean thickness of 0.08". Plastic shall be recyclable and contain ultra-violet inhibitors.
3. Basic properties shall equal or exceed the following:
 - a. Tensile Stress Yield: ASTM D638 3800
 - b. Elongation at break (%): ASTM D638 10%
 - c. Tensile Modulus: ASTM D638 150,000 psi
 - d. Notched Izod Impact: ASTM D256A 0.4-4.0
 - e. Flexural Modulus 73 psi: ASTM D790 145,000
 - f. Hardness Shore: ASTM D2240 P66
4. The contractor shall furnish and install tree root barriers as specified. The tree root barriers shall be the EP Series manufactured by NDS, or approved equal.

PART 3 - EXECUTION

3.01 OBSERVATION

- A. Verify that final grades have been established prior to beginning planting operations. Observe trees, shrubs and liner stock plant material for injury, insect infestation and trees and shrubs for improper pruning. Do not begin planting of trees until deficiencies are corrected or plants replaced.

3.02 LAYOUT OF PLANTING AREAS

- A. Stake or mark with lime, locations for plants and outline of planting beds on ground. Do not begin excavation until plant locations and plant beds are acceptable to the Owner's Representative. The irrigation system shall be operational and approved prior to planting.
- B. Locations for plants and outlines of areas to be planted shall be marked on the ground by the Contractor before any plant pits are dug. All such locations shall be approved by the Owner's Representative. If an underground construction or utility line is discovered prior to work, other locations for planting may be selected by the Owner's Representative.

3.03 PREPARATION

A. Preparation of Planting Area

1. Eradicate and remove weeds by means of post emergent herbicide. Apply herbicide as per manufacturer's recommendations.
2. After approximate finished grades have been established, soil shall be conditioned and fertilized in the following manner. Soil conditioner shall, at the following rate, be uniformly spread and cultivated thoroughly by means of mechanical tiller into the top six (6) inches of soil. Existing planting areas shall be cultivated by hand tools.

Application Rates:

- a. One hundred fifty (150) pounds of soil conditioner per 1,000 square feet.
- b. Three (3) cubic yards of soil amendment per 1,000 square feet.
- c. Eighteen (18) pounds of soil amendment fertilizer per 1,000 square feet.
- d. For annual color planting beds, in addition to items 'a' and 'b', incorporate:

- 1) Fifteen (15) cubic feet of Perlite per 1,000 square feet.
- 2) Three (3) cubic yards nitrogen stabilized shavings per 1,000 square feet.
3. All soil areas shall be compacted and settled by application of heavy irrigation to a minimum depth of twelve (12) inches.
4. At time of planting, the top six (6) inches of all areas to be planted shall be free of stones, stumps, or other deleterious matter one-half (1/2) inch in diameter or larger, and shall be free from all wire plaster, or similar objects that would be a hindrance to planting and maintenance.

B. Final Grades

1. Provide finished grading to ensure proper drainage of the site. Conform to specification Section 31 22 19 – FINISH GRADING or SECTION 31 22 00 – ROUGH GRADING.
2. The following areas shall be grades so that the final grades shall be established below adjacent paved areas, sidewalks, valve boxes, headers, clean outs, drains, manholes, etc. as follows:
 - a. Shrub/groundcover areas: 3-1/2 inches
 - b. Sod areas: 1 inch
3. Surface drainage shall be away from all building foundations.
4. Remove excess or unacceptable soil from the site.

C. Steel Header

1. Steel headers shall be furnished as shown on the Contract Documents and herein specified. They shall be laid true to line and grade. Care shall be exercised in laying headers to protect adjacent improvements, shrubbery, and other properties from damage. All stakes shall be placed on ground cover side of header board.
2. Stake and install per manufacturers recommendations and installation instructions.

3.04 PLANT INSTALLATION

A. General

- a. Actual planting shall be performed during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice, as approved by the Owner's Representative.
- b. Only as many plants as can be planted and watered that same day shall be planted.

- B. Container shall be opened and plants shall be removed in such a manner that the ball of earth surrounding the roots is not broken and they shall be planted and watered as herein specified immediately after removal from the containers. Containers shall not be opened prior to placing the plants in the planting area.

C. Root Barrier Installation

1. Linear Application: The contractor shall install the tree root barriers with the number of panels and in the manner shown on the Contract Documents. Vertical root deflecting ribs must face towards the root ball. The top of the panel shall be 1/2" above the finish grade, but in all cases be covered by mulch. Panels shall be connected by sliding the male end

on each panel into the female connector on the next panel to form either a circle around the root ball or a linear barrier along adjacent hardscape, whichever is specified.

2. Surround Application: Closely follow the outer perimeter of the planting area. Do not encircle the root ball or limit plant growth.

D. Planting of Trees and Shrubs

1. Excavation for planting shall include the stripping and stocking of all acceptable topsoil encountered within the areas to be excavated for trenches, tree holes, plant pits and planting beds.
2. Excess soil generated from the planting holes and not used as backfill or in establishing the final grades shall be removed from the site.
3. Excavating for Planting
 - a. Shape
 - 1) Vertical sides with bottom raised in center, tapering to edges of pit.
 - 2) Plant pits to be square for box material, circular for canned material.
 - 3) Scarify sides and bottom of each pit.
 - b. All trees and shrubs shall have planting pits dug twice the diameter of the rootball. Backfill around the rootball with prepared backfill mix.
 - c. Protect all areas from excessive compaction when trucking plants or other materials to planting site.
 - d. Can Removal
 - 1) Cut cans on two (2) sides with an acceptable can cutter.
 - 2) Do not injure the rootball.
 - 3) Do not cut cans with spade or ax.
 - 4) Carefully remove plants without injury or damage to rootball.
 - 5) After removing plant, superficially cut edgeroots with knife on three (3) sides.
 - e. Box Removal
 - 1) Remove bottom of plant boxes before planting.
 - 2) Remove sides of box without damage to rootball after positioning plant and partially backfilling.
 - f. Center plant in pit.
 - g. Face plants with fullest growth into prevailing wind.
 - h. Set plant plumb and hold rigidly in position until soil has been tamped firmly around ball roots.
 - i. Crowns of rootballs shall be installed above finish grade.
 - j. Remainder of planting pit shall be backfilled with:
 - 1) Three (3) parts rock-free native soil
 - 2) One (1) part nitrogen stabilized shavings
 - 3) Fifteen to eighteen (15-18) pounds Gro-Power Plus planting pit fertilizer per cubic yard of mix.
 - 4) Specified type and quantity of planting tablets.
 - k. All plants which settle shall be raised to the correct level. After the plant has been placed, additional backfill shall be added to the hole to cover approximately one-half (1/2) of the height of the rootball. Water shall be added to the top of the partly filled hole to thoroughly saturate the rootball and adjacent soil.
 - l. After the water has completely drained, planting tablets shall be placed adjacent to but not in contact with rootball.
One (1) tablet per 1-gallon container
Two (2) tablets per 5-gallon container
Three (3) tablets per 15-gallon container

- Four (4) tablets per 24" box
- Five (5) tablets per 30" box
- Six (6) tablets per 36" box
- Seven (7) tablets per 42" box
- Eight (8) tablets per 48" box and larger box sizes

- m. The remainder of the hole shall be backfilled.
- n. After backfilling an earthen basin shall be constructed around each plant. Each basin shall be of a depth sufficient to hold at least two (2) inches of water. Basin shall be of a size suitable for the individual plant. In no case shall the basin for fifteen (15) gallon plant be less than four (4) feet in diameter; a five (5) gallon plant less than three (3) feet in diameter. The basins shall be constructed of amended backfill materials, and shall not be constructed for trees in turf areas.
- o. Pruning shall be limited to the minimum necessary to removed injured twigs and branches and to compensate for loss of roots during transplanting, but never to exceed one-third (1/3) of the branching structure. Upon approval of the Owner's Representative, pruning may be done before delivery of plant, but not before plants have been observed and approved. Prune as per specifications SECTION 32 98 00 - LANDSCAPE MAINTENANCE.
- p. Staking of all trees shall conform to tree staking details. One (1) tree of each size shall be staked and approved by the Owner's Representative prior to the continuation of staking.

E. Planting of Ground Cover

- 1. Ground cover shall be planted in straight rows and evenly spaced, unless otherwise noted, and at intervals called out in the Contract Documents. Triangular spacing shall be used unless otherwise noted on the Drawing.
- 2. Each rooted plant shall be planted with its proportionate amount of flat soil or in a peat pot in a manner that will insure minimum disturbance of the root system, but in no case shall this depth be less than two (2) nodes. To avoid drying out, planting shall be immediately irrigated after planting until the entire area is soaked to the full depth of each hole, unless otherwise noted on the Drawing.
- 3. Care shall be exercised at all times to protect the plants after planting. Any damage to plants by trampling or other operations of this Contract shall be repaired immediately.

F. Mulch Cover

- 1. All planting areas, with the exception of lawn areas, shall be top-dressed with a three (3) inch layer of mulch.

G. Weed Control

- 1. Apply weed control to all non-turf areas after completion of all planting and one (1) complete watering (to "set" plants). Apply as per manufacturer's recommendations.

H. Hardpan Conditions

- 1. Where hardpan exists, whether it is in the form of caliche or other impervious clay, and it is within the top two-and-one-half feet (2-1/2') of soil, use powered equipment to break through completely at each tree location to allow drainage and root growth. Remove hardpan at least one-and-one-half feet (1-1/2') greater than the rootball diameter of tree. Backfill with soil mix as specified.

2. Where hardpan is within the first twelve (12) inches of soil, it shall be completely penetrated for all trees and shrubs.

3.05 OBSERVATION SCHEDULE

- A. The Contractor shall be responsible for notifying the Owner's Representative in advance for the following observations according to the time indicated:
 1. Pre-construction conference - 7 days.
 2. Irrigation pressure line and lateral line installation and testing - 48 hours.
 3. Irrigation sprinkler coverage test - 48 hours.
 4. Finish grade review - 48 hours.
 5. Plant material review - 48 hours.
 6. Soil preparation, plant layout and planting operations. One (1) tree with each type of specified shall be approved prior to planting of trees - 48 hours.
 7. End of landscape installation - 48 hours.
 8. End of landscape maintenance/Final Acceptance - 48 hours.
- B. No site visits shall commence without all items noted in previous Observation Reports either completed or remedied, unless such compliance has been waived. Failure to accomplish punch list tasks or prepare adequately for desired observations shall make the Contractor responsible for reimbursing the Owner's Representative at their current billing rate per hour, plus transportation costs.

3.06 CLEAN UP

- A. After all planting operations have been completed; remove all trash, excess soil, empty plant containers or rubbish from the property. All scars, ruts or other marks in the ground caused by this work shall be repaired and the ground left in a neat and orderly condition throughout the site. The Contractor shall pick-up all trash resulting from this work no less frequently than each Friday before leaving the site, once a week, and/or the last working day of each week. All trash shall be removed completely from the site. The Contractor shall leave the site area broom-clean and shall wash down all paved areas within the Contract area, leaving the premises in a clean condition acceptable to the Owner and the Owner's Representative.

3.07 LANDSCAPE MAINTENANCE

- A. Provide Landscape Maintenance as per SECTION 32 98 00 - LANDSCAPE MAINTENANCE.

END OF SECTION 32 93 00

PART 1 - GENERAL

1.01 CONDITIONS

- A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements apply to the work specified in this Section.

1.02 SCOPE OF WORK

- A. Furnish all labor, material, equipment and services required to maintain landscape in a healthy growing condition and in a neat and attractive appearance throughout the maintenance period.

1.03 QUALITY ASSURANCE

- A. The Contractor shall be experienced in horticulture and landscape maintenance, practices and techniques, and shall provide sufficient number of workers with adequate equipment to perform the work during the maintenance period.

1.04 MAINTENANCE PERIOD

- A. Maintain the entire project area during progress of work and during the sixty-(60) calendar-day maintenance period or until final acceptance of the project. Maintenance shall continue beyond the maintenance period, as required, until final acceptance is given by the Owner's Representative and Owner.
- B. Maintenance period shall not start until all elements of construction, planting and irrigation for the entire project are in accordance with Plans and Specifications. A requirement is that all lawn and landscape areas be planted and that all lawn areas show an even, healthy stand of grass seedlings or sod, either of which shall have been mown twice. If such criteria are met to the satisfaction of the Owner's Representative, written notification shall be issued to establish the effective beginning date of maintenance period.
- C. Any day of improper maintenance, as determined by the Owner's Representative, shall not be credited as an acceptable maintenance period day. The maintenance period shall be extended on a daily basis if the work is not in accordance to the Plans and Specifications. Project shall not be segmented into maintenance areas or phases, unless authorization of the Owner's Representative is obtained.
- D. Contractor shall provide protection to the project site during the maintenance period. Any damage caused by the lack of adequate site protection shall be repaired or replaced at no additional cost to the Owner.

1.05 GUARANTEE AND REPLACEMENT

- A. All plant material and other materials installed under the Contract shall be guaranteed for the duration of the landscape maintenance period against any and all poor, inadequate or inferior materials and/or workmanship, acts of God, animal or insect damage or improper maintenance, as determined by the Owner's Representative. Material shall be replaced by the Contractor at his expense.
- B. Any materials found to be dead, missing, or not in a satisfactory or healthy condition during the maintenance period shall be replaced immediately. The Owner's Representative shall be the sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the Contractor within five (5) days of written notification by the Owner. All replacement materials and installations shall comply with the Plans and

Specifications. Any plant missing due to suspected theft shall be replaced by the Contractor. If the Contractor suspects theft may be a problem, the Contractor shall provide written documentation to the Owner that security on this site needs to be intensified. The Contractor may relieve himself of theft responsibility if, after the security notice, with no result, a written notice to the Owner shall be given that plant material will not be replaced for theft or vandalism due to lack of site security being maintained. This procedure may take place only during the Landscape Maintenance Period.

1.06 OBSERVATION SCHEDULE

- A. Observations shall be requested by the Contractor from the Owner's Representative as per observations listed in specifications SECTION 32 93 00 - LANDSCAPE INSTALLATION.

1.07 FINAL ACCEPTANCE OF THE PROJECT

- A. Upon completion of all project work, including maintenance period, the Owner's Representative will, upon proper request, make an observation to determine final project acceptability.
- B. Where observed work does not comply with the Plans and Specifications, replace rejected work and continue specified maintenance period until re-inspected by the Owner's Representative and determined to be acceptable. All replacement materials and installations shall be in accordance with the Plans and Specifications. Remove rejected work and materials immediately from project. Prior to date of final observation, Contractor shall provide the Owner's Representative with all Record Contract Documents, turnover items and written Guarantee Statement in accordance with the Drawings and Specifications.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All materials used shall conform to Specifications or shall otherwise be acceptable to the Owner. The Owner shall be given a monthly record of all herbicides, insecticides and disease control chemicals used.
- B. General fertility maintenance fertilizer: shall consist of the following percents by weight:
 - a. 16% nitrogen
 - b. 6% phosphoric acid
 - c. 8% potash
- C. Slow release fertilizer: shall consist of the following percents by weight:
 - a. 21% nitrogen
 - b. 3% phosphoric acid
 - c. 5% potash

PART 3 - EXECUTION

3.01 GENERAL

- A. Maintenance shall be according to the following standards. All areas shall be weeded and cultivated at intervals of not more than ten (10) days. Watering, trash and debris removal, mowing, rolling, edging, trimming, fertilization, spraying and pest control, as required, shall be included in the maintenance period. Street gutters and sidewalks shall be included. The Contractor shall be responsible for maintaining adequate protection of the area. Damaged areas shall be repaired at the Contractor's expense. Between the 15th day and the 20th day of the maintenance period, the Contractor shall reseed or resod all spots or areas within the

lawn where normal turf growth is not evident. Replenish mulch to originally specified depth on a monthly basis, or more frequently as required.

3.02 TREE AND SHRUB CARE

A. Watering

1. Maintain a large enough water basin around plants so that enough water can be applied to establish moisture through the major root zone. When hand watering use a water wand.

B. Pruning

1. Trees:

- a. Prune trees only as required to select and develop permanent scaffold branches that are smaller in diameter than the trunk or branch to which they are attached and which have a vertical spacing of from 18" to 48" and radial orientation so as not to overlay one another; to eliminate diseased or damaged growth; to eliminate narrow V-shaped branch forks that lack strength; to reduce toppling and wind damage by thinning out crowns; to maintain growth within space limitations; to maintain a natural appearance to balance crown with roots.
- b. Evergreen trees shall be thinned out and shaped when necessary to prevent wind and storm damage.
- c. The primary pruning of deciduous trees shall be done during the dormant season. Damaged trees or those that constitute health or safety hazards shall be pruned at any time of the year as required.

2. Shrubs:

- a. The objectives of shrub pruning are the same as trees. Under no circumstances shall shrubs be clipped into balled or boxed forms unless required by the design.
- b. All pruning cuts shall be made to lateral branches or buds or flush with the trunk. "Stubbing" will not be permitted.

C. Staking

1. Stakes shall remain in place through acceptance and are to be inspected to prevent girdling of trunks or branches and to prevent rubbing that causes bark wounds.

D. Weed Control

1. Keep basins and areas between plants free of weeds. Use recommended, legally approved herbicides. Avoid frequent soil cultivation that destroys shallow roots. Use mulches to help prevent weed germination.

E. Insect and Disease Control

1. Maintain a reasonable control with approved materials.

F. Fertilization

1. Fertilize all planting areas with the following:
2. Commencement of maintenance period - 5 lbs. per 1,000 square feet with general fertility maintenance fertilizer.

- a. At the end of the first 30-day maintenance period - 5 lbs. per 1,000 square feet with general fertility maintenance fertilizer.
 - b. At the end of the maintenance period and at 30-day intervals should maintenance period be extended - 10 lbs. per 1,000 square feet with slow release fertilizer.
3. Avoid applying fertilizer to the root ball and base of main stem; rather, spread evenly under plant to drip line. Rates will vary from about a cup of nitrate fertilizer (depending on nitrogen percentage) around a newly installed small plant to about one-half (1/2) lb. of actual nitrogen per inch of trunk diameter measured four feet from the ground for mature trees.

G. Replacement of Plants

1. Replace dead, dying and missing plants with plants of a size, condition and variety to match plants acceptable to Owner at Contractor's expense under the conditions stated in the Guarantee and Replacement section of these specifications.

3.03 GROUND COVER CARE

A. Weed Control

1. Control weeds, preferably with preemergent herbicides, but also with selective systemic herbicides. Hoe weeds as little as possible since this may result in plant damage.

B. Watering

1. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth. Refer to irrigation schedule as noted on Plans.

C. Trash

1. Remove trash and debris weekly. Dispose in a legal manner.

D. Edging and Trimming

1. Edge ground cover to keep in bounds and trim growth as necessary to achieve an overall even appearance.

E. Replacement

1. Replace dead and/or missing plants at Contractor's expense per the conditions stated in the Guarantee and Replacement section of these Specifications.

3.04 TURF CARE

A. Mowing and Edging

1. Mowing of turf will commence when the grass has reached a height of two inches. The height of cut will be 1 to 1-1/2". Mowing will be at least weekly after the first cut. Turf must be well established and free of bare spots and weeds to the satisfaction of the Owner's Representative prior to final acceptance.
2. Grass clippings shall be picked up and removed from the site and premises in a legal manner.

3. Edges shall be trimmed at least twice monthly or as needed for neat appearance. Clippings shall be removed from paved areas and planting areas and removed from the site.

B. Watering

1. Lawns shall be watered at such frequency as weather conditions require to replenish soil moisture below root zone and to establish healthy stands of turf.

C. Weed Control

1. Control broad leaf weeds with selective herbicides. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal, Balan, or Beteasan for control prior to crabgrass germination.

D. Fertilization

1. During maintenance period an application of general fertility maintenance fertilizer, as specified, shall be made every thirty (30) days and again at sixty (60) days from the date of lawn installation at a rate of five (5) pounds per 1,000 square feet. At the end of the maintenance period apply slow release fertilizer at a rate of ten (10) pounds per 1,000 square feet or as per manufacturer's recommendations.

E. Replacement

1. At conclusion of maintenance period a final observation of turf areas shall be made. Remove diseased areas and unhealthy stands of grass from the site; do not bury into the soil. Replant areas with materials and in a manner as specified on the Plans and Specifications at no additional cost to the Owner

3.05 IRRIGATION SYSTEM

A. System Observation

1. The Contractor shall check all systems for proper operation. Lateral lines shall be flushed out by removing the last sprinkler head at each end of the lateral. All heads are to be adjusted as necessary for unimpeded, head to head coverage.

B. Controllers

1. Program automatic controllers to utilize automatic seasonal / environmental condition adjustments. An irrigation schedule has been provided on the drawings as a guide. A schedule is required to be completed using data from the Irrigation Audit, and to be included in the Irrigation Audit Report. The irrigation schedule included in the Irrigation Audit Report should be used as a guide once complete, as it will supersede the Irrigation Schedule included on the drawings. Refer to specification section 32 84 00 Irrigation System, paragraph 1.03.C.5 for more information about the Irrigation Audit and Report.
2. The Contractor shall give the Owner's representative instructions on how to turn off the irrigation system in case of emergency.

C. Repairs

1. Repair all damages to irrigation system at the Contractor's expense. Repairs shall be made within twenty-four (24) hours.

END OF SECTION



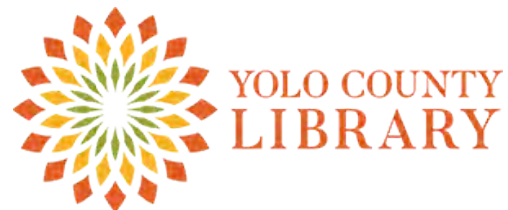
PROJECT MANUAL

Volume 1: Bidding and Contracting Requirements
May 7, 2021

Yolo Branch Library
37750 Sacramento Street, Yolo, California



County of Yolo



Bids Due before 2:00PM, Thursday, June 24, 2021 at
Yolo County Administrator's Office
625 Court Street, Room 202
Woodland, CA 95695

<u>DIVISION 0 – BIDDING & CONTRACTING REQUIREMENTS</u>		
	00 01 15	List of Bid Documents
	00 12 00	Notice to Bidders
	00 20 00	Instructions to Bidders
	00 41 00	Bid Form
	00 42 00	Bidder's Bond
	00 43 00	Subcontractor List
	00 45 10	Non-Collusion Affidavit
	00 45 26	DAS Form 7 – Agreement to Train Apprentices
	00 51 00	Notice of Award
	00 52 00	Construction Agreement
	00 55 00	Notice to Proceed
	00 61 00	Performance Bond
	00 62 00	Payment Bond
	00 62 10	Indemnification
	00 70 00	General Conditions

END TABLE OF CONTENTS for VOLUME 1

SECTION 00 01 15

LIST OF BID DOCUMENTS

BID DOCUMENTS:

A. PROJECT MANUAL

1. Volume 1: Bidding and Contracting Requirements dated May 7, 2021
2. Volume 2: Project Specifications dated May 7, 2021

B. PROJECT PLANS, WMB Architects, dated May 7, 2021 ‘Bid Set’

SUPPLEMENTAL DOCUMENTS:

- A. Geotechnical Engineering Report, Wallace Kuhl & Associates, ‘Yolo Branch Library’ (WKA Report No. 12406.01P) dated September 5, 2019 and revised June 16, 2020

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 and services for the performance of the following Work:

Yolo Branch Library, 37750 Sacramento Street, Yolo, California, all as shown on the plans and described in the specifications and special provisions.

The project consists of a new, 4,000 square foot (approximate) single story public library building of Type V construction. The new building will house library program area, staff office, study rooms, a community meeting room, and support spaces.

The project will also include, but is not limited to utilities, electrical, plumbing, mechanical, heating, ventilation and air conditioning, communications, fencing, onsite septic system, and fire protection systems, as well as landscaping and pavement for parking, building access, and outdoor functions.

The project is to be staged and constructed in such a way as to allow the continued operation of the existing onsite modular library building for as long as possible to limit the downtime of community library services.

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 BidSync (<https://www.BidSync.com>). The County Project Manager will respond to all Contractor questions through the BidSync Question and Answer section on this website.

SEALED BIDS:

Sealed bids on the above project shall be filed with Yolo County, County Administrator's Office, located at 625 Court Street, Room 202, Woodland, CA 95695, on or before **2:00 pm on Thursday, June 24, 2021**.

All bids must be marked clearly on the envelope: **"Yolo Branch Library"**. Said bids will be opened in public after **2:05 pm** of said day in the Atrium Training Room in the Erwin Meier Administration Building, 625 Court Street, Woodland, CA. 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 ninety (90) 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.

Please note: All individuals delivering bids and Bid Opening attendees will be required to comply with the County's mandates related to Covid-19 safety including the wearing of masks and physical distancing.

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 B License as required by the categories and type of work. 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 ($\frac{1}{2}$ 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

It is a County policy that, in order to be deemed a responsive bidder, the bidder must participate in a joint apprenticeship committee. The California Department of Industrial Relations defines a joint apprenticeship committee as a committee made up of equal number of members from labor and management. **Bidders must submit with their bid a completed California Department of Industrial Relations' DAS-7 form that documents the bidder's participation in a joint apprenticeship committee. Bids that are not accompanied by such proof of participation will be rejected.** The County will verify participation prior to the award.

BID EXAMINATION AND PREPARATION:

Construction Documents may be obtained at BidSync (<https://www.BidSync.com>) or at the Yolo County Website (under *Doing Business with the County*). Documents will be available beginning on Monday, February 22, 2021. 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
McGraw Hill
Sacramento Regional Builders Exchange
El Dorado Builders Exchange
Placer County Contractors Association

The Bidder shall carefully examine the Bid Documents, including the Plans and Specifications 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 less than 7 days prior to the bid date may not be answered.

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 AFFIDAVIT:

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

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/dprevagedetermination.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 County Administrator's Office of the County. 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 responsive, responsive bidder within Ninety (90) 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 \$3,100,00 - \$3,400,000.

PRE-BID CONFERENCE:

Bidders must attend one of two pre-bid conferences to be held at the project site (37750 Sacramento Street, Yolo, CA) at 10:00 a.m. on Tuesday, June 1, 2021 and 2:00 p.m. on Thursday, June 3, 2021.

Attendance at one of the pre-bid conferences is mandatory. Any questions that can be answered at that time by direct reference to the Contract, Plans and Specifications, will 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.

Please note: All Pre-Bid Conference attendees will be required to comply with the County's mandates related to Covid-19 safety including the wearing of masks and physical distancing.

PROJECT MANAGER:

All communications relative to the Contract Documents and Plans shall be posted on 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 County Administrators Office, County of Yolo, State of California.

By:

Kevin Yarris
County of Yolo
General Services

SECTION 00 20 00

INSTRUCTIONS TO BIDDERS

1. Bids are requested for a general construction contract, or work described in general, as follows:

**Yolo Branch Library
37750 Sacramento Street, Yolo, California**

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 45 10 Non-collusion Affidavit with their bids. Bids submitted without the affidavit will be deemed non-responsive and will not be considered.
8. 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.
9. 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 also be posted or made available by addendum. 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.

10. Bids shall be clearly written without erasure or deletions. The County reserves the right to reject any Bid containing erasures or deletions.
11. Bidders may not modify Bid Form or qualify their Bids.
12. 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.
13. 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.
 - (A) **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.
 - (B) **Joint Apprenticeship Committee Participation Requirement**
It is a County policy that, in order to be deemed a responsive bidder, the bidder must participate in a joint apprenticeship committee. The California Department of Industrial Relations defines a joint apprenticeship committee as a committee made up of equal number of members from labor and management. **Bidders must submit with their bid**

a completed California Department of Industrial Relations' DAS-7 form that documents the bidder's participation in a joint apprenticeship committee. Bids that are not accompanied by such proof of participation will be rejected. The County will verify participation prior to the award.

14. 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, **BidSync** at <https://www.BidSync.com>. The County Project Manager will respond to all Contractor questions through the BidSync 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 BidSync will be binding. Oral and other interpretations or clarifications will be without legal effect.
15. Addenda may also be issued to modify the Bidding Documents as deemed necessary by the County and consultants.
16. 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.
17. 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.
 - (A) 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.
 - (B) 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.
 - (C) Substitutions may not be requested between bid opening and issuance of the Notice of Award.
18. Bids will be received at County of Yolo, County Administrator's Office Room 202, 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.
 - (A) Envelopes or boxes must be sealed, and marked with name and address of the Bidder, and addressed to:

Yolo County, County Administrators Office
625 Court Street, Room 202
Woodland, CA 95695

(B) Mark envelopes:

Yolo Branch Library

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

(D) 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, 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 45 00 Bidder Information Sheet
 - 5) Document 00 45 10 Non-collusion Affidavit: To be subscribed and sworn before a notary public.
19. Envelopes will be opened in public following receipt of bids after **2:05 pm on Thursday, June 24, 2021**, in the Atrium Training Room of the Erwin Meier Administration Building, 625 Court Street, Woodland, CA.
20. 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.
- (A) Submit the following documents to the Project Manager by 5:00 p.m. of the TENTH business day following opening and inspection of bids.
- 1) Insurance Certificates and Endorsements required by Document 00 70 00 General Conditions Article 2
- (B) Submit the following documents to the Project Manager 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 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.

(C) The apparent low Bidder and each of its subcontractors who employ workers in any apprentice able craft or trade, shall apply to the joint apprenticeship committee administering the apprenticeship standards of the craft or trade for a certificate approving the contractor or subcontractor under the apprenticeship standards for the employment and training of apprentices, pursuant to section 1777.5 of the California Labor Code.

21. Any bid protest must be submitted in writing to the Project Manager, before 5 p.m. of the FIFTH business day following bid opening.

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

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

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

(D) 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.

(E) 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 future contract award.

(F) 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.

22. The County reserves the right 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 to waive

inconsequential 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.

23. 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.
24. 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.
25. If the contract is to be awarded, it will be awarded to the lowest responsible, responsive Bidder and Base Bid. The award of the Contract will be subject to availability of funds and approval of Department of Financing per SB863 Lease Revenue Bond Financing requirements.
26. 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.
27. 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.

SECTION 00 41 00

BID FORM

Project: Yolo Branch Library, 37750 Sacramento Street, Yolo, California

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 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 00200 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 00700 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 on next page)

Base Bid Total Price for the Yolo Branch Library Project

\$ _____

(written)

Dollars

Enclosed find Bidder's Bond, certified check or cashier's check No. _____ of the
_____ (Company/Bank), for \$ _____.

Dated this _____ day of _____, 2021

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 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 (Contract).
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 (Agreement).
12. The undersigned herewith encloses the completed Non-Collusion Affidavit – 00 45 10.
13. The undersigned herewith encloses the completed DAS Form 7 – 00 45 26.

14. 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 Branch Library** for
which bids are to be opened in public in the Erwin Meier Administration Building, 625 Court Street,
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
Yolo Branch Library

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. (Note: All column and row spaces for each listed subcontractor shall be filled in with; Work to be Performed, Name of Subcontractor, Bid Price, DIR and CA License type(s) and Number(s), Mailing Address and Phone Number). Use additional lists as necessary. The awarded contractor will be required to fully fill in all rows and columns of this list.

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

Non-Collusion Affidavit To Be Executed By Bidder and Submitted with Bid

State of California)) ss.
County of Yolo)

_____, being first duly sworn, deposes and says that he or she is

_____ of _____ the party making the foregoing bid that the bid is not made in the interest of, or in behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in 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 secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and further, that 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, or paid, and will not pay, any depository, or to any member or agent thereof to effectuate a collusive or sham bid.

COMPANY NAME

COMPANY ADDRESS

SIGNATURE OF OFFICER _____

TITLE

SECTION 00 45 26

AGREEMENT TO TRAIN APPRENTICES

DAS Form 7

Joint Apprenticeship Committee Participation Requirement

The County adopted a policy that one of requirements to be deemed a responsive bidder is that the bidder must be participating in a joint apprenticeship committee. The California Department of Industrial Relations defines a joint apprenticeship committee as a committee made up of equal number of members from labor and management. **Bidders must complete and submit the attached California Department of Industrial Relations' DAS-7 form that documents the bidder's participation in a joint apprenticeship committee.** The County will verify participation prior to the award.

AGREEMENT TO TRAIN APPRENTICES

District No. _____

DAS File No. _____

Employer ID _____

NAME OF EMPLOYER				
MAILING ADDRESS (STREET AND NUMBER)	CITY	STATE	ZIP CODE	TELEPHONE NUMBER
ADDRESS OF TRAINING LOCATION (IF DIFFERENT)				
OCCUPATION(S)			O*Net Code	
NAME OF APPRENTICESHIP COMMITTEE AND STANDARDS				
AREA COVERED BY APPRENTICESHIP STANDARDS or NAME AND ADDRESS OF PROJECT				

THE OFFICIAL, whose signature follows, agrees on behalf of the above named employer to train apprentices in the designated occupation in accordance with the apprenticeship standards and apprentice agreement and to comply with the provisions thereof.

[SIGNED] By _____

Printed name _____

Title _____ Date _____

THE APPRENTICESHIP COMMITTEE accepts and approves the employer as qualified to train apprentices under its standards in the designated occupation.

[SIGNED] By _____

Printed name _____

Title _____ Date _____

Accepted:

DIVISION OF APPRENTICESHIP STANDARDS

Effective until:

☐ Revoked

☐ End of Project (Enter project name and address in Area Covered above)

☐ Date _____
Date

☐ Other _____
Specify

EFFECTIVE DATE

[SIGNED] By _____ Date _____
Apprenticeship Consultant

REMARKS:

STATE OF CALIFORNIA
DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF APPRENTICESHIP STANDARDS

SECTION 00 51 00

NOTICE OF AWARD

Dated: xxxxxxxx, 2021

TO: xxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxx

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

ADDRESS: xxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxx

PROJECT: YOLO BRANCH LIBRARY
37750 Sacramento Street
Yolo, CA 95697

COUNTY OF YOLO CONTRACT

CONTRACT FOR: **The Yolo Branch Library located in the Town of Yolo, California.**

The Contract Price of your contract is xxxxxxxxxxxxxxxxxxxxxxxx Dollars (\$xxxxxxxxxxxxxx).

One copy of each of the proposed Contract Documents (except Drawings) accompany this Notice of Award. Drawings will be delivered electronically under separate cover.

Upon receipt of this Notice of Award, you and each of your subcontractors who employ workers in any apprenticeship 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 xxxxxxxxxxxxxxxxxxxxxx, 2021.

1. You must deliver to The County one fully executed counterpart of the Contract (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.

The County of Yolo

BY: _____

Kevin Yarris
Director, General Services Department
County Administrator's Office

Authorized by:

The County of Yolo

SECTION 00 52 00

COUNTY OF YOLO, CALIFORNIA

**CONSTRUCTION AGREEMENT FOR THE YOLO BRANCH LIBRARY
37750 Sacramento Street, Yolo, California
CONTRACT NO. _____**

This Agreement for Construction ("Agreement") is between _____, 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 Branch Library, 37750 Sacramento Street, Yolo, California**, in accordance with the plans and specifications.
- 2. CONTRACT DOCUMENTS.** The documents defined as the "Contract Documents" in Section 1.12 of the General Conditions, which are incorporated as if fully set forth herein by this reference, comprise the entire Agreement between the County and Contractor concerning the above-referenced project. The documents that describe the work to be performed are sometimes collectively referred to herein as the Plans and Specifications. In the event of any conflict between any of the provisions of the Contract Documents, 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 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 Manager of Facilities Services and Capital Programs 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) days after receiving the Contract Administrator's Notice to Proceed and shall complete the work within **360 calendar days** after receiving that notice. This work must be complete, operational, have a Temporary Occupancy Permit and be turned over to the County for its intended use for this milestone to be deemed complete. County understands the nature of weather and will allow for rain delays to the project, if applicable.
 - (b) Liquidated Damages.** Contractor shall pay County **\$2,500.00** 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.
- 4. INDEMNIFICATION.** Contractor's indemnity, defense, and related obligations shall be as specified in Section 00 62 10 of the Project Manual.

5. **COMPENSATION.** All matters of compensation shall be governed by the General Conditions, including but not limited to Article 25 thereof.

6. **INSURANCE.** Contractor shall maintain the following insurance while performing the services 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 insurance 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. 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. The General Contractor/**and or 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 General Contractor/**and or 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. 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).

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 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 contract (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. 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:

Kevin Yarris
Director, General Services
120 West Main Street Suite D
Woodland, CA 95695
Telephone: (530) 406-5005

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. The plans and specifications attached as Exhibit A are part of this Agreement. If any conflict arises between Exhibit A and the terms and conditions set forth in Sections 1 through 14 of this Agreement, then Sections 1 through 14 shall govern.

(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) **Dispute Resolution.** Unless the General Conditions provide otherwise, if the Contract Administrator notifies Contractor that the work or any portion of it is unacceptable, then the Contract Administrator and Contractor shall meet at the Yolo County Office of County Administrator, 625 Court Street #202, Woodland, California, within five (5) days after Contractor receives the notice (excluding Saturdays, Sundays, and County observed holidays) and shall attempt in good faith to resolve their differences. Payment shall not constitute approval or acceptance of any defective work.

(g) **Integration.** This Agreement sets forth the parties' entire understanding regarding the matters set forth in Sections 1 through 14. It supersedes all prior Agreements and representations, written and oral, and may be modified only by a written Agreement approved by County's Board of Supervisors and signed by County and Contractor.

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

COUNTY OF YOLO:

CONTRACTOR:

By: _____

Kevin Yarris
Director, General Services

By: _____
(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, 2021

TO: xxxxxxxxxxxxxx (Contractor)

ADDRESS: xxxxxxxxxxxxxx
xxxxxxxxxxxxxx

RE: COUNTY OF YOLO

PROJECT: **Yolo Branch Library, Yolo, California**

BID NO. 02

CONTRACT NO. _____

CONTRACT FOR

Yolo Branch Library, 37750 Sacramento Street, Yolo, California

You are notified that the Contract Time under the above contract will commence to run on xxxxxxxxxxxxxxxxxxxxxx, 2021. By that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 3 of the Contract (Document 00 52 00), the date of final completion 360 calendar days from the date of this notice.

THE COUNTY OF YOLO

By: _____

Kevin Yarris
Director, General Services Department
County Administrators Office

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 the Project Plans and Specifications 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 said 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)

SECTION 00 62 00

PAYMENT BOND

BOND NO. _____

KNOW ALL MEN BY THESE PRESENTS: That

WHEREAS, the Board of Supervisors of the County of Yolo, State of California, (hereinafter designated as "County") and _____ (hereinafter designated as "Principal") have entered into an Agreement (County Agreement No. _____, dated _____, 20__) for the furnishing of all materials, labor, services and transportation, necessary, convenient, and proper to the construction of **the Yolo Branch Library**: _____, which Agreement and all of the Contract Documents attached to or forming a part of said Agreement are hereby referred to and made a part hereof; and

WHEREAS, said Principal is required under the terms of said Contract to furnish a bond to secure payment of all claims under Chapter 7 of Title 15 of Part 4 of Division 3 of the Civil Code of California and the other statutes noted below.

NOW, THEREFORE, said Principal and the undersigned _____, (hereinafter designated as "Surety"), are held and firmly bound unto the County, and unto all laborers, material men and other persons referred to in said statutes, in the sum of _____ DOLLARS (\$ _____) (not less than 50% of the Contract price), lawful money of the United States of America, for the payment of which sum well and truly made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally by these presents.

The condition of this bond is that if the Principal does well and truly pay any persons named in Civil Code Section 3181, or amounts due under the Unemployment Insurance Code with respect to work or labor performed by any such claimant, or any amounts required to be deducted, withheld and paid over to the Franchise Tax Board from the wages of employees of the Principal and his subcontractors pursuant to Section 18806 of the Revenue and Taxation Code with respect to such work and labor, pay all such persons and amounts, then this obligation shall become null and void; otherwise it shall be and remain in full force, virtue and effect.

If the said Principal or any of his or its subcontractors, or the heirs, executors, administrators, successors, or assigns of any, all or either of them, shall fail to well and truly pay any such persons or amounts then the Surety shall promptly pay the County the sum stated above. Surety, for value received, hereby expressly acknowledges and agrees that no change, extension of time, forbearance or waiver, prepayment or delay in payment, alteration or addition to the terms of the Contract Documents, whether by virtue of the provisions for modifications contained therein or by separate Agreement between the Principal and the County, shall in any manner affect its obligations on this Agreement, and said Surety hereby expressly waives notice of and consents to any such change, forbearance or waiver, extension of time, prepayment or delay in payment, alteration or addition.

Death of the Principal shall not relieve Surety of its obligations hereunder.

This bond shall inure to the benefit of any of the persons named in the above referenced statutes so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

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

IN WITNESS WHEREOF, two identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by Principal and Surety above named, on the ____ day of _____, 2021.

Principal (SEAL)

By: _____
Principal's Representative

Principal's Address

City, State, Zip

Surety (SEAL)

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.

State of California
County of _____

On _____ before me, (here insert name and title of the officer),
_____ personally appeared personally
known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s)
is/are subscribed to the within instrument as the Attorney In Fact of
_____ ("Surety") 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.

WITNESS my hand and official seal.

Printed Name

Signature of Notary

My Commission Expires

(Seal)

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

GENERAL CONDITIONS

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SECTION 00700

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 General Services Department 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 General Services Department 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 chief executive officer of the County and reports to the Board of Supervisors.

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; Division 00 Bidding and Contracting Requirements; 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 Board of Supervisors. 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. DIVISION 1.

"Division 1" of the Technical Specifications sets forth general procedures by which the Contractor complies with the requirements of the Contract Documents.

Division 1 is intended to supplement, not supersede or prevail over, the requirements of the General Conditions, Supplementary Conditions, or remaining divisions of the Technical Specifications. Thus, in the

event of a conflict between the requirements of Division 1 and other portions of the Contract Documents, the Contractor shall notify the Contract Administrator of the claimed discrepancy, and the Contract Administrator shall issue a Clarification correcting the discrepancy. The Contractor shall follow such written instructions.

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 County 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 Director of General Services 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. His/Her 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.

See Division 1, Section 01 10 00 – County Personnel for details.

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 consisting of the Division 1 requirements and subsequent Divisions 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 1.30. 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.

See Division 1, Section 01340 for details.

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. SUPPLEMENTAL 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.

Except to the extent that specific indemnity provisions of these General Conditions may apply, Contractor's indemnity, defense, and related obligations shall be as specified in Section 00 62 10 of the Project Manual.

Nothing contained in the indemnity provisions of the Agreement for Construction shall be construed to require the Contractor to indemnify the County in contravention of Section 2782 of the Civil Code.

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 through out 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 Section 01340 of Division 1, and shall include all submittals required by Divisions 2-16.

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 ninety (90) 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 Board of Supervisors, 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 his sole discretion. Such Contract Time Extension Change Orders may be approved only by the Board of Supervisors, however.

- 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 to the Board of Supervisors.

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.

Upon receiving the Contract Administrator's recommendation to the Board of Supervisors regarding the Contractor's request for a time extension and/or cost adjustment, the Contractor may either withdraw its application for extension or request that it be scheduled for action by the Board of Supervisors. If the Board of Supervisors 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 Board of Supervisors 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 Board of Supervisors 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 Board of Supervisors 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 Board of Supervisors pursuant to Section 3.07 hereinabove, are discretionary time extensions approved by the Board of Supervisors pursuant to Section 3.10 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/or 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 Documents are intended to be coordinated to describe and provide for the complete Project.

In the event of a conflict between the Contract Drawings and the Technical Specifications of the Project Manual, the Contract Drawings shall govern in matters of quantity and the Specifications shall govern in matters of quality. In the event of conflict within the contract Drawings involving quantity or within the Specifications involving quality, the greater quantity and the higher quality shall be furnished.

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 Section 01720 of Division 1.

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 Section 01340 of Division 1.

All submittals shall be complete in every respect and shall include all information required both by the particular Technical Specification section and by Section 01340 of Division 1.

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 Section 01340 of Division 1, 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 Sections 01340 and 01640 of Division 1 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 Section 01340 of Division 1.
 - 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 RE: 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.

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. Further particulars regarding methods of storage are provided in Section 01600 of Division 1.

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 or in Division 1 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.

See Section 01 20 13 - Payment for Delivered Materials and Equipment for further particulars.

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 Section 01640 of Division 1.

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.

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.

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 established a new 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.

Contractors will be subject to a registration and annual renewal fee that has been set initially at \$300. The fee is non-refundable and applies to all contractors and subcontractors who intend to bid or perform Work on public Works projects (as defined under the Labor Code).

Contractors will apply and pay the fee online and must meet minimum qualifications to be registered as eligible to bid and Work on public Works projects:

Contractors will apply and pay the fee online and must meet minimum qualifications to be registered as eligible to bid and Work on public Works projects:

- Must have Workers' compensation coverage for any employees and only use subcontractors who are registered public Works contractors.
- Must have Contractors State License Board license if applicable to trade.
- Must have no delinquent unpaid wage or penalty assessments owed to any employee or enforcement agency.
- Must not be under federal or state debarment.
- Must not be in prior violation of this registration requirement once it becomes effective. However, for the first violation in a 12-month period, a contractor may still qualify for registration by paying an additional penalty.

The registration fee is not related to any project. It is more like a license that enables the registrant to bid on and perform public Works.

- Registrations will begin after July 1, 2014, once the registration system is ready to go online. The preferred method of payment will be by credit card.
- The requirement to list only registered contractors and subcontractors on bids becomes effective on March 1, 2015. The requirement to only use registered contractors and subcontractors on public Works projects applies to all projects awarded on or after April 1, 2015.

All contractor registration fees will go into the State Public Works Enforcement Fund and be used to fund the following items:

- Administration of contractor registration requirement

- all DIR costs for administering and enforcing public Works laws
- Labor Commissioner's enforcement of other Labor Code violations on monitored public Works projects.

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."

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).

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 is 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.

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. See Section 01720 of Division 1 for further particulars.

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. See Section 01500 of Division 1 for further particulars.

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.

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 I.

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 Board of Supervisors.

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 Division 1 and 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 facilities 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.

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 Division 1. 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 the Agreement for Construction.

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 its 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.

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 Division 1, 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, Section 01720 of Division 1, 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, as required by Section 01735 of Division 1.

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 also prepare a recommendation on the Contractor's request for a Final Change Order, if any. The final estimate shall be transmitted to the Yolo County Board of Supervisors along with the Contractor's Request for final payment and the Contract Administrator's recommendations on the Contractor's request for final Change Order, if any. 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 BOARD OF SUPERVISORS.

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 Clerk of the Board of Supervisors, 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 relieve 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
General Services Director
General Services Department
120 West Main Street, Suite D
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 Board of Supervisors 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 completing 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 28.05. 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.

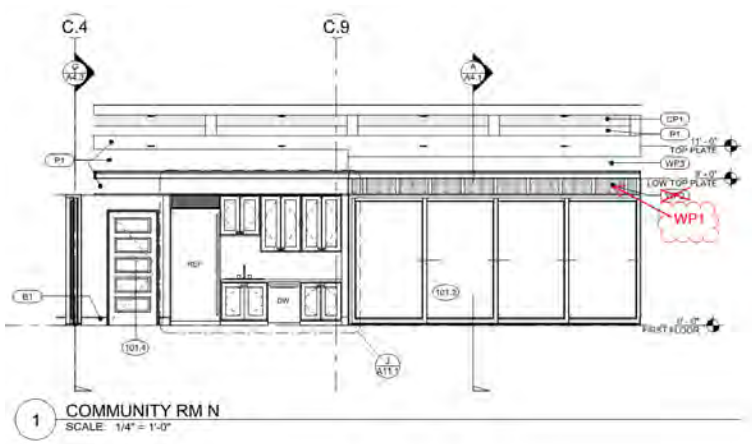
END OF GENERAL CONDITIONS

ADDENDUM #001

Date: June 16, 2021
(9) pages including attachments

LIST OF ADDENDUM ITEMS:

<u>Item</u>	<u>Description</u>	<u>Attachment</u>	<u>No. pages</u>
1.	Paragraph 20 (C) of Section 00 20 00 of the Project Manual – ‘Instructions to Bidders’ (page 00 20 00- 5) shall be deleted and replaced with the following language: (C) 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 this section upon request by the County. This requirement is separate from and in addition to the obligation to participate in a Joint Apprenticeship Committee as set forth in Section 00 12 00 ‘Notice to Bidders’ in this Project Manual. Revised Section 00 20 00 ‘Instructions to Bidders’ is attached.	Revised Section 00 20 00 of the Project Manual: ‘Instructions to Bidders’	6
2.	Clarification to Scope – rooftop photovoltaic panels: Key Note 26.07 on Sheet A3.1 states ‘Photovoltaic Panels – Ref. Elect. Dwgs’. The solar panel system is not to be included in this Bid. It may be installed by the County under separate contract after this project is complete.	None	0
3.	Specification Section 12 24 13 refers to the Finish Schedule on the Drawings for window shade fabric selection; however, there is no selection listed on the Drawings. Roller window shade fabric shall be MechoShade EuroTwill 6450 Series, 3% open; color: 6468 ‘White Stone’	None	0

Item	Description	Attachment	No. pages
4.	Clarification to Scope – leach lines for onsite septic system Reference Civil Utilities Plan, Sheet C401: Leach lines shown dashed on Utilities Site Plan are intended to identify the replacement field as required by Environmental Health. Only leach lines shown as solid lines (four 42.5' long pipes with inspection ports at far end per Key Note 17) are to be installed under this project. Installation of dashed leach lines in area identified as 'Replacement Field' should be excluded from Bid.	None	0
5.	Clarification to Scope – permanent perimeter fence: Per Key Note 32.07 on the Architectural Site Plan (Sheet A1.1), the Contractor shall construct a new 6' high redwood fence along the north property line (approximately 150 feet in length). Bids shall include the demolition and removal of the existing wood fence along the north property line in addition to the construction of the new fence in its place. Per Key Note 32.14, Sheet A1.1, the Contractor shall construct a new 42" high hog panel fence along the east property line from back of walk to existing fence to remain (Key Note 32.17), approximately 70 feet in length.	None	0
6.	Clarification to Scope – FRP in Janitor's Room 106: FRP panels scheduled as wall finish in the Janitor's Room 106 on Room Finish Schedule (Sheet A10.1) shall be installed in full-height sheets (8'-0") above wall base on all walls of the room. Upper wall surfaces above top of FRP shall be painted to match the ceiling.	None	0
7.	Correction to Plans, Reference Interior Elevation 1, Sheet 10.2: Wall Panel above Door 101.2 (exterior sliding door system) at North wall of Community Room 101 is mislabeled 'WP2' and should read 'WP1' – 	None	0

<u>Item</u>	<u>Description</u>	<u>Attachment</u>	<u>No. pages</u>														
8.	Clarification to Scope – suspended acoustical tile ceiling: Ceilings in the following rooms are to be suspended on t-bar grid systems as described on the Reflected Ceiling Plan (Sheet A9.1), scheduled on the Room Finish Schedule (Sheet A10.1), and specified in Specification Section 09 51 13 'Suspended Acoustical Tile Ceilings': <table><tr><td>Room 102</td><td>Storage</td></tr><tr><td>Room 103</td><td>Friends</td></tr><tr><td>Room 107</td><td>Office</td></tr><tr><td>Room 108</td><td>Teen Room</td></tr><tr><td>Room 109</td><td>Study (2)</td></tr><tr><td>Room 110</td><td>Study (2)</td></tr><tr><td>Room 111</td><td>Study (4)</td></tr></table> Ceiling framing shown or implied on the Drawings can be omitted above the rooms listed above with the exception of Office Room 107, the framing above which is part of the mezzanine floor and shall be included/constructed as described on Ceiling Framing Plan, Sheet S1.03.	Room 102	Storage	Room 103	Friends	Room 107	Office	Room 108	Teen Room	Room 109	Study (2)	Room 110	Study (2)	Room 111	Study (4)	None	0
Room 102	Storage																
Room 103	Friends																
Room 107	Office																
Room 108	Teen Room																
Room 109	Study (2)																
Room 110	Study (2)																
Room 111	Study (4)																

END OF ITEMIZED ADDENDUM LIST

ATTACHMENTS FOLLOW:

- Revised Section 00 20 00 'Instructions to Bidders' 6 pages

SECTION 00 20 00

INSTRUCTIONS TO BIDDERS

1. Bids are requested for a general construction contract, or work described in general, as follows:

**Yolo Branch Library
37750 Sacramento Street, Yolo, California**

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 45 10 Non-collusion Affidavit with their bids. Bids submitted without the affidavit will be deemed non-responsive and will not be considered.
8. 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.
9. 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 also be posted or made available by addendum. 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.

10. Bids shall be clearly written without erasure or deletions. The County reserves the right to reject any Bid containing erasures or deletions.
11. Bidders may not modify Bid Form or qualify their Bids.
12. 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.
13. 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.
 - (A) **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.
 - (B) **Joint Apprenticeship Committee Participation Requirement**
It is a County policy that, in order to be deemed a responsive bidder, the bidder must participate in a joint apprenticeship committee. The California Department of Industrial Relations defines a joint apprenticeship committee as a committee made up of equal number of members from labor and management. **Bidders must submit with their bid**

a completed California Department of Industrial Relations' DAS-7 form that documents the bidder's participation in a joint apprenticeship committee. Bids that are not accompanied by such proof of participation will be rejected. The County will verify participation prior to the award.

14. 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, **BidSync** at <https://www.BidSync.com>. The County Project Manager will respond to all Contractor questions through the BidSync 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 BidSync will be binding. Oral and other interpretations or clarifications will be without legal effect.
15. Addenda may also be issued to modify the Bidding Documents as deemed necessary by the County and consultants.
16. 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.
17. 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.
 - (A) 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.
 - (B) 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.
 - (C) Substitutions may not be requested between bid opening and issuance of the Notice of Award.
18. Bids will be received at County of Yolo, County Administrator's Office Room 202, 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.
 - (A) Envelopes or boxes must be sealed, and marked with name and address of the Bidder, and addressed to:

Yolo County, County Administrators Office
625 Court Street, Room 202
Woodland, CA 95695

(B) Mark envelopes:

Yolo Branch Library

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

(D) 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, 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 45 00 Bidder Information Sheet
 - 5) Document 00 45 10 Non-collusion Affidavit: To be subscribed and sworn before a notary public.
19. Envelopes will be opened in public following receipt of bids after **2:05 pm on Thursday, June 24, 2021**, in the Atrium Training Room of the Erwin Meier Administration Building, 625 Court Street, Woodland, CA.
20. 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.

(A) Submit the following documents to the Project Manager by 5:00 p.m. of the TENTH business day following opening and inspection of bids.

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

(B) Submit the following documents to the Project Manager 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 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.

~~(C) The apparent low Bidder and each of its subcontractors who employ workers in any apprenticeable craft or trade, shall apply to the joint apprenticeship committee administering the apprenticeship standards of the craft or trade for a certificate approving the contractor or subcontractor under the apprenticeship standards for the employment and training of apprentices, pursuant to section 1777.5 of the California Labor Code.~~

(C) 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 this section upon request by the County. This requirement is separate from and in addition to the obligation to participate in a Joint Apprenticeship Committee as set forth in Section 00 12 00 'Notice to Bidders' in this Project Manual.

21. Any bid protest must be submitted in writing to the Project Manager, before 5 p.m. of the FIFTH business day following bid opening.

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

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

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

(D) 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.

(E) 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 future contract award.

- (F) 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.
22. The County reserves the right 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 to waive inconsequential 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.
23. 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.
24. 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.
25. If the contract is to be awarded, it will be awarded to the lowest responsible, responsive Bidder and Base Bid. The award of the Contract will be subject to availability of funds and approval of Department of Financing per SB863 Lease Revenue Bond Financing requirements.
26. 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.
27. 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.

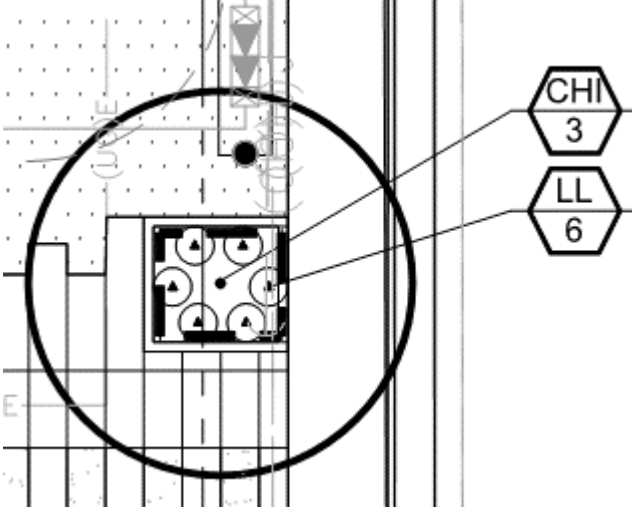
END OF SECTION 00 20 00

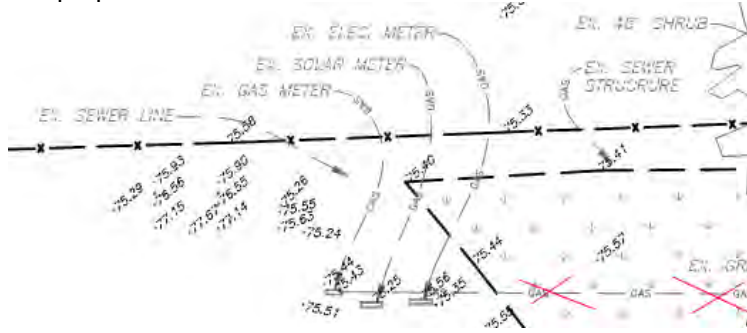
ADDENDUM #002

Date: June 22, 2021
(14) pages including attachments

LIST OF ADDENDUM ITEMS:

<u>Item</u>	<u>Description</u>	<u>Attachment</u>	<u>No. pages</u>
1.	Bid Date Extension – The advertised Bid Date shall be modified as set forth below: <u>Bids shall be due no later than 2:00PM on Tuesday, June 29, 2021.</u>	None	0
2.	Revised Bid Form is attached providing for acknowledgement of Addenda #1 and #2. In addition, Bidders shall provide unit pricing (cubic feet) for off-haul and disposal of unsuitable soils materials and import of engineered fill. Unit pricing shall assume no hazardous materials in soil. Bid Form has been amended to provide space to enter unit pricing.	Revised Bid Form	4
3.	Clarification to scope of work – trenching for gas service: Bidders shall include in the bid trenching and backfilling for the new gas line to be installed by PG&E including onsite and offsite (in-street) portions, and bellhole at gas main, per PG&E gas service drawings on Sheet E1.3. Contractor shall secure and pay for encroachment permit(s) from Yolo County Public Works, provide traffic controls, and restore paving in Second Street to the satisfaction of Yolo County Public Works within the bid.	None	0
4.	Revision to scope of work – tap of public water main for fire sprinklers and hydrant: Notes 3 & 4 on Sheet C401 shall be amended to require General Contractor (Bidder) to perform the work of tapping into public water main and connecting new laterals for fire sprinkler and fire hydrant service in addition to trenching, backfilling, and pavement restoration. Contractor shall secure and pay for encroachment permit(s) from Yolo County Public Works, provide traffic controls, and restore paving in Second Street to the satisfaction of Yolo County Public Works within the bid.	None	0

<u>Item</u>	<u>Description</u>	<u>Attachment</u>	<u>No. pages</u>
5.	Clarification to scope of work – interior wood paneling – There is a discrepancy between project plans and specifications regarding the interior wood paneling product. Specification Section 06 20 00 'Finish Carpentry' shall govern. Trim profiles described on the Drawings shall still be used as the basis of design.	None	0
6.	Additional scope of work – tree removal and replacement: Bidders shall include in the bid removal of the existing Chinaberry tree shown to remain (onsite adjacent east property line, reference Sheet L1.1), including root ball. Bidders shall include an additional 7'-0" x 7'-6" planter with irrigation, 15 gal. Desert Willow, and (6) 1 gal. dwarf mat rush shrubs to match similar planters along sidewalk at Second Street: 	None	0
7.	Additional scope of work – raceway for future solar: Bidders shall include in the bid a 2" conduit from spare on main electrical service switch board 'MSB' identified for 'Future Solar' to roof at hatched area identified on the Roof Plan (Sheet A7.1) as 'PV Area'.	None	0
8.	Clarification to scope of work – valve box adjustment: Bidders shall include in the bid the adjustment to new grade of the existing water valve box serving existing fire hydrant at southwest corner of site on Sacramento Street, if required.	None	0
9.	Clarification to scope of work – demolition of concrete paving: Per Note 9 on Sheet A0.1, the concrete pad under the existing modular building is 6" thick and shall be removed by the Contractor after the modular building is removed from the site. The adjacent concrete paving (walkway and accessible parking stall) is 5" thick and shall be removed by the Contractor as indicated on the Drawings.	None	0

Item	Description	Attachment	No. pages
10.	Clarification to scope of work – existing onsite utilities: The existing gas meter, solar meter, electrical, meter, sewer line, and sewer structure shown on Sheet C101 and captured below have already been removed as part of the demolition of the original library building. Contractor shall remove two existing abandoned gas lines within site boundary as part of site preparation. 	None	0
11.	Clarification to scope of work – doors and door hardware: Revised Door Schedule is attached to correct references to Door Hardware Groups in the Specifications. Tag for Door 100.2 was missing from Notation Floor Plan, Sheet A2.2. Partial plan exhibit is attached to identify this door. Door 100.2 has been added to the revised Door Schedule.	Revised Door Schedule and Partial Notation Floor Plan	2
12.	Correction to specifications – Door Hardware 08 71 00: Hinges under Door Hardware Group 007 are listed mistakenly as 'Existing'. New Interior-type hinges shall be provided for doors in this Hardware Group.	None	0
13.	Clarification to scope of work – brick pavers: All brick pavers shown on site improvement/ landscape plans shall be provided by the Contractor in accordance with Specification Section 32 14 16 'Brick Pavers'. Bidders should note the delivery and pick-up requirements to accommodate engraving by County's vendor described in §1.4 DELIVERY.	None	0
14.	Revision to scope of work – electrical service: Refer to redlines on attached Sheet E1.1 for coordination with PG&E service sketch, also attached. PG&E will install pole-mounted transformer. Transformer pad and protection shown on Sheet E1.1 can be eliminated from scope. Contractor shall trench, install 5" conduit, and backfill from MSB to new PG&E pole in accordance with PG&E standards. In addition, pull box for future County data use shall be Christy N48 as redlined on this sheet.	E1.1 (redline) and PG&E Electrical Construction Sketch dated 06/30/2020	2

<u>Item</u>	<u>Description</u>	<u>Attachment</u>	<u>No. pages</u>
15.	Clarification to scope of work – power to parking lot lighting: Reference Detail 2, Sheet E1.2 PVC is acceptable for conduit stubbed to parking lot light pole base. N9 pull boxes are not required at each pole.	None	0
16.	Clarification to scope of work – HSS column base plate details: Refer to attached HSS COL BASE PLATE ANCHORAGE and SLAB COL BLOCKOUT details for base plate condition at HSS columns identified on the Foundation Plan, Sheet S1.01.	HSS COL BASE PLATE ANCHORAGE and SLAB COL BLOCKOUT	2
17.	Clarification to scope of work – onsite septic system – Bidders shall price the onsite septic system in accordance with the information and details shown on the Drawings. Selected Contractor shall apply for and pull the Environmental Health Department permit for septic system. Contractor/ subcontractor installing septic system for this project shall have demonstrated experience installing similar onsite disposal systems. A list of local septic system installers/ contractors is available from the Yolo County Environmental Health Department. Contractor shall pay for Environmental Health Department septic system permit: \$1264 permit fee + \$174 setback review fee.	None	0

END OF ITEMIZED ADDENDUM LIST**ATTACHMENTS FOLLOW:**

Revised Bid Form 00 41 00 – 4 pages (reference Item #2), dated 06/22/2021

Revised Door Schedule – 1 page (reference Item #11), dated 6/21/21

Partial Notation Floor Plan – 1 page (reference Item #11), dated 6/21/21

Sheet E1.1 Redline – (1) 24x36 sheet (reference Item #14), dated 06/22/2021

PG&E Construction Sketch – (1) 11x17 sheet (reference Item #14), dated 06/30/2020

HSS Column Base Plate and Slab Blockout details – 2 pages (reference Item #16), dated 06/22/2021

SECTION 00 41 00

BID FORM

Project: Yolo Branch Library, 37750 Sacramento Street, Yolo, California

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 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).

Addendum #	Issue Date	Bidder's Acknowledgement (initials)
Addendum #1	June 16, 2021	
Addendum #2	June 22, 2021	

- (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 00700 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:

Base Bid Total Price for the Yolo Branch Library Project

\$ _____

(written)

Dollars

Enclosed find Bidder's Bond, certified check or cashier's check No. _____ of the
_____ (Company/Bank), for \$ _____.

Dated this _____ day of _____, 2021

Unit Pricing

Off-haul and disposal of unsuitable soil (no haz mat), per cubic yard: \$ _____

Import of engineered fill, per cubic yard: \$ _____

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 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 (Contract).
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 (Agreement).
12. The undersigned herewith encloses the completed Non-Collusion Affidavit – 00 45 10.
13. The undersigned herewith encloses the completed DAS Form 7 – 00 45 26.

14. 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

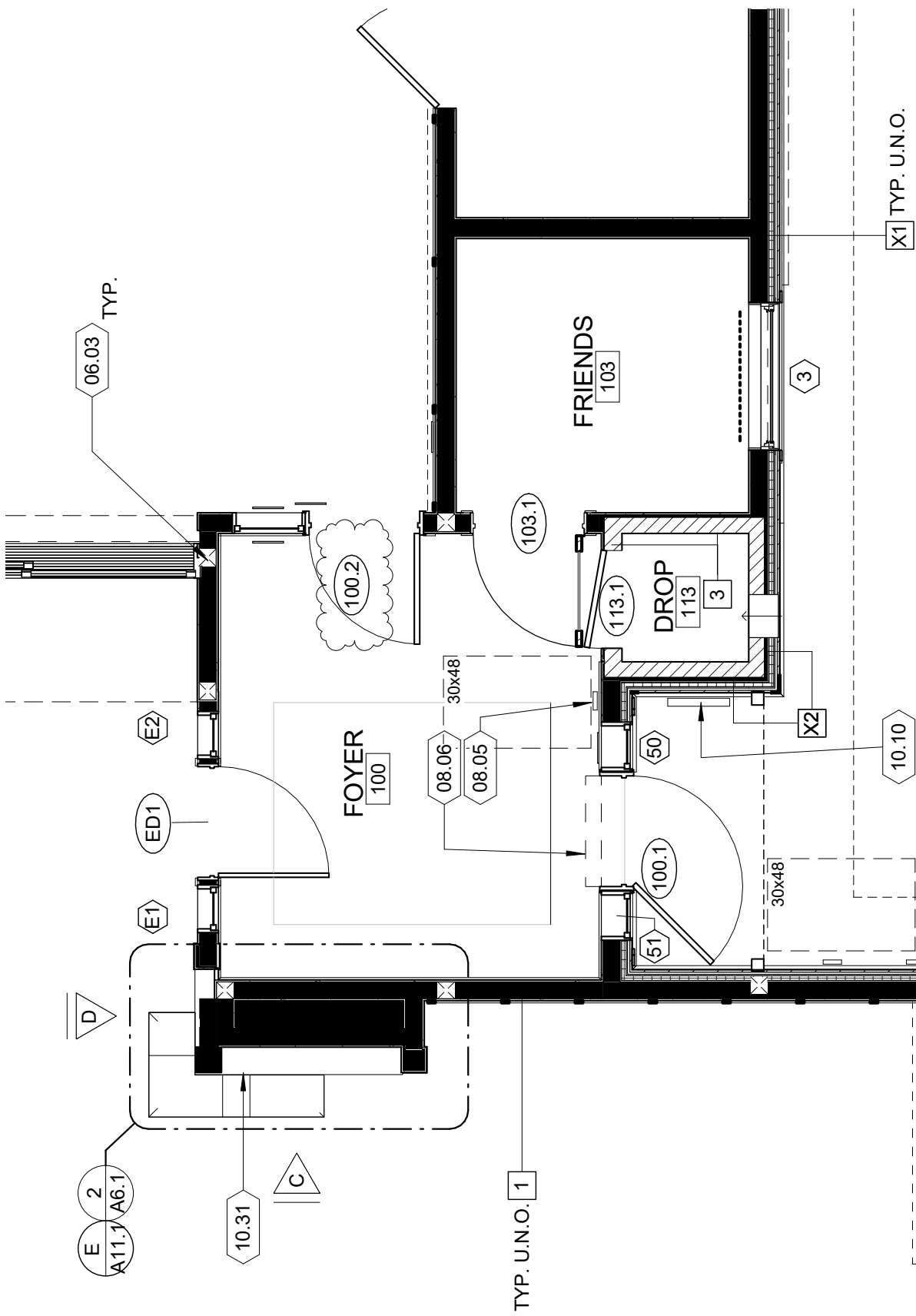
Telephone Number

Date of Bid

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

Printed Name

Title

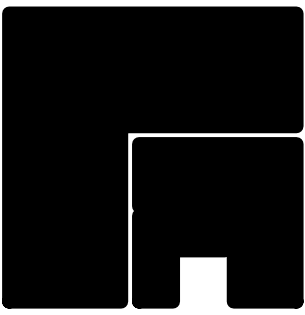


PARTIAL NOTATION FLOOR PLAN

SCALE: 1/4" = 1'-0"

ADDENDUM

WMB ARCHITECTS	YOLO BRANCH LIBRARY 37750 Sacramento St Yolo, CA 95697 06/21/21	ORIGINAL SHEET REFERENCE 15-016 SHEET A2.2



WMB
ARCHITECTS

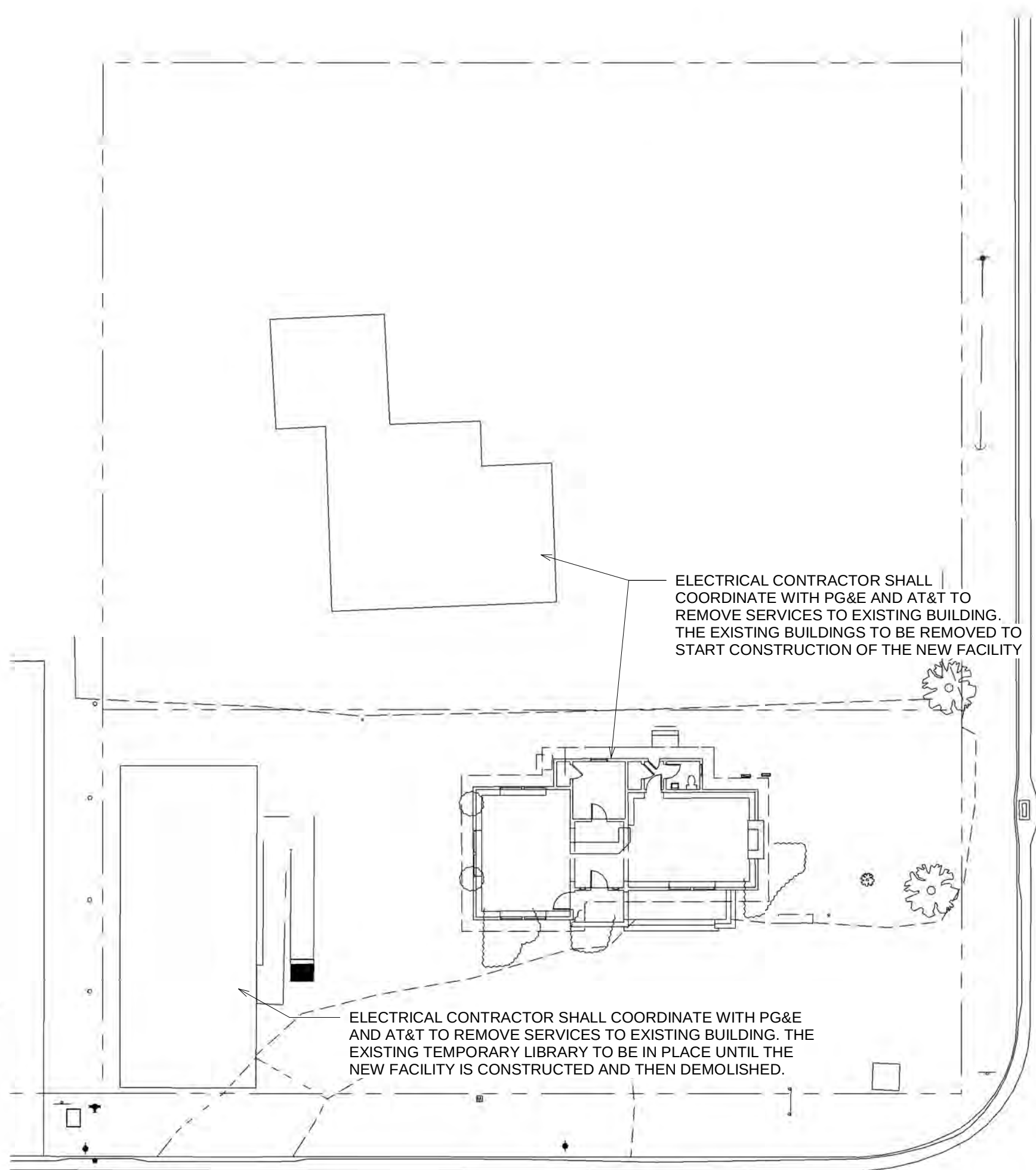
5757 Pacific Avenue
Suite 226
Stockton, CA 95207

2000 L Street
Suite 125
Sacramento, CA 95811

T 209.944.9110
F 209.944.5711
www.wmbarchitects.com

YOLO BRANCH
LIBRARY
37750 Sacramento St
Yolo, CA 95697

ELECTRICAL SITE PLAN

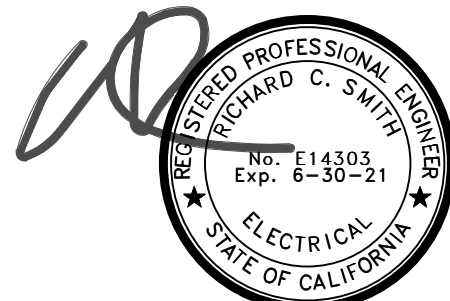


2 ELECTRICAL SITE DEMOLITION PLAN
SCALE: 1" = 20'-0"

ELECTRICAL SITE PLAN NOTES	
Note Number	Note
1	UTILITY TRANSFORMER. ELECTRICAL CONTRACTOR SHALL PROVIDE TRANSFORMER PAD, GROUNDING AND BARRIER POSTS PER UTILITY COMPANY REQUIREMENTS
2	STUB 1"CO TO PANEL "P" FOR FUTURE EV CHARGER

SITE FIXTURE SCHEDULE					
Type Mark	Lamp	Description	Manufacturer	Model	Apparent Load
P1	LED	POLE MOUNT LIGHT. SEE DETAIL SHEET E1.3.	LITHONIA	DSX0 LED P3 40K T3M MVOLT SPA PER DDBXD	70 VA
P2	LED	8" BOLLARD. SEE DETAIL SHEET E1.2.	LITHONIA	BRE8 LED	30 VA
P3	PS-30	IN-GRADE SIGN LIGHT, 2'-0" BACK FROM SIGN.	HYDREL	M9430A B LED P3 35K MVOLT WWD FLC 34B BTR 13 Z	28 VA
P4	PS-30	FLAG POLE FLOOD LIGHT, BRONZE FINISH.	LITHONIA	OFLY LED 45 P1 40K MVOLT YK DDEXD	45 VA

PUBLISH HISTORY:
DATE REVISION
1 01.31.20 CO. OF YOLO REVIEW
1 01.05.21 100% CD
2 05.07.21 BID
06-22-21 ADDENDUM #2

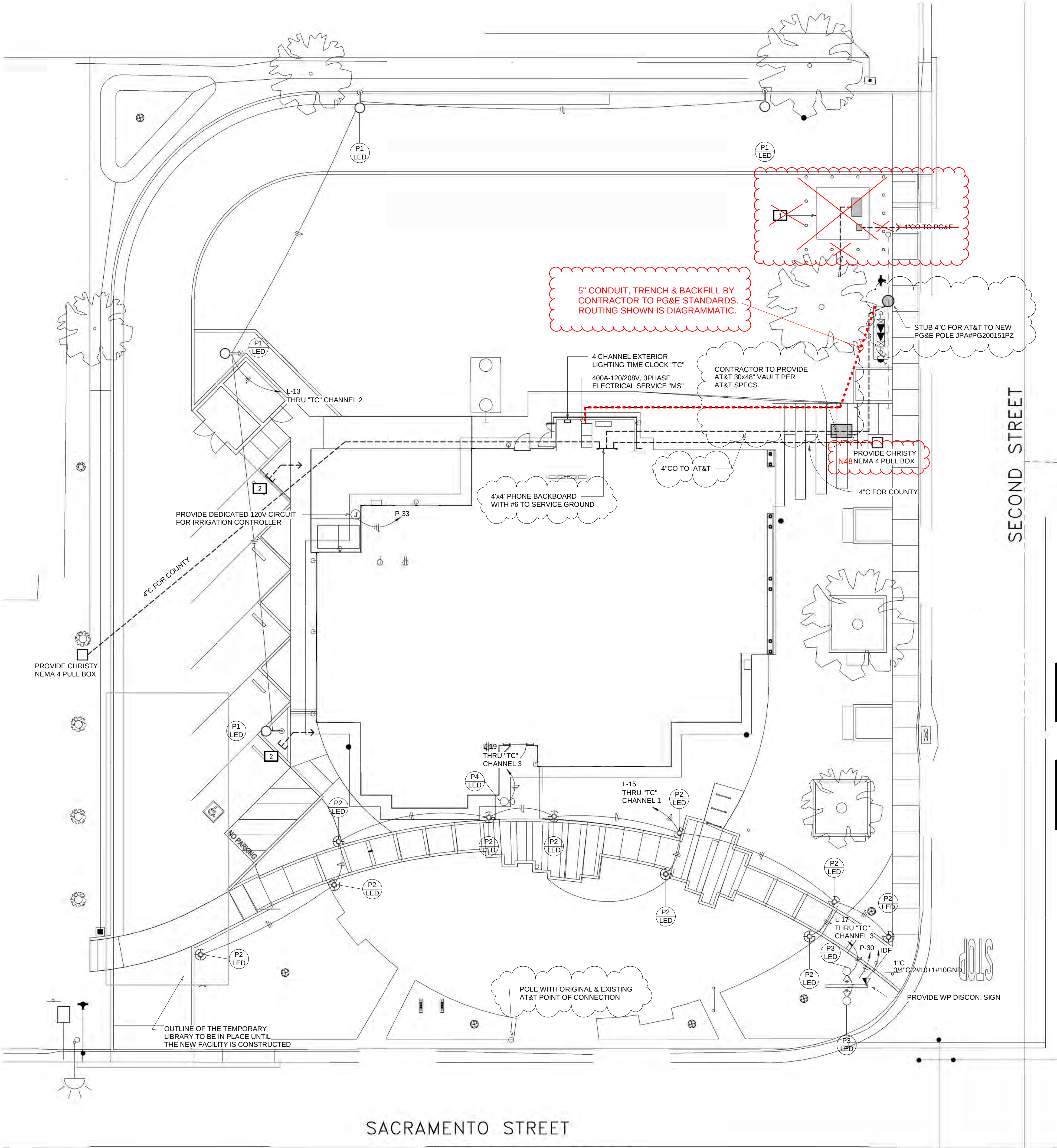


HCS
Engineering
50 years

4512 Feather River Dr #F, Stockton, CA 95219
209-478-8270 | www.hcs-eng.com

Richard C. Smith, PE richard@hcs-eng.com
Bhupendra Patel, PE bhupendra@hcs-eng.com
Elizabeth Aguilar elizabeth@hcs-eng.com
PROJECT # 2019.081

E1.1



1 ELECTRICAL SITE PLAN
SCALE: 1" = 10'-0"

CUSTOMER NOTES:

CUSTOMER TO TRENCH, INSTALL DUCTS, SUBSTRUCTURES AND BACKFILL - BACKFILL MATERIAL MUST BE ON SITE & BE INSPECTED PRIOR TO USE - SAND OR NATIVE BACKFILL (IF APPROVED).

BACKFILL MATERIAL CONTAINING NOT MORE THAN OCCASIONAL ROUNDED ROCKS LESS THAN 1/2" DIAMETER IS ACCEPTABLE.

BACKFILL USE WILL BE AT THE DISCRETION OF PG&E INSPECTOR.

CUST. CONDUIT MUST BE RIGID SCHEDULE 40 PVC

CONDUIT MUST BE PROVEN FREE & CLEAR BY MEANS OF A MANDREL.

INST. A POLYESTER PULLING TAPE IN DUCTS ATTACHED TO END CAPS.

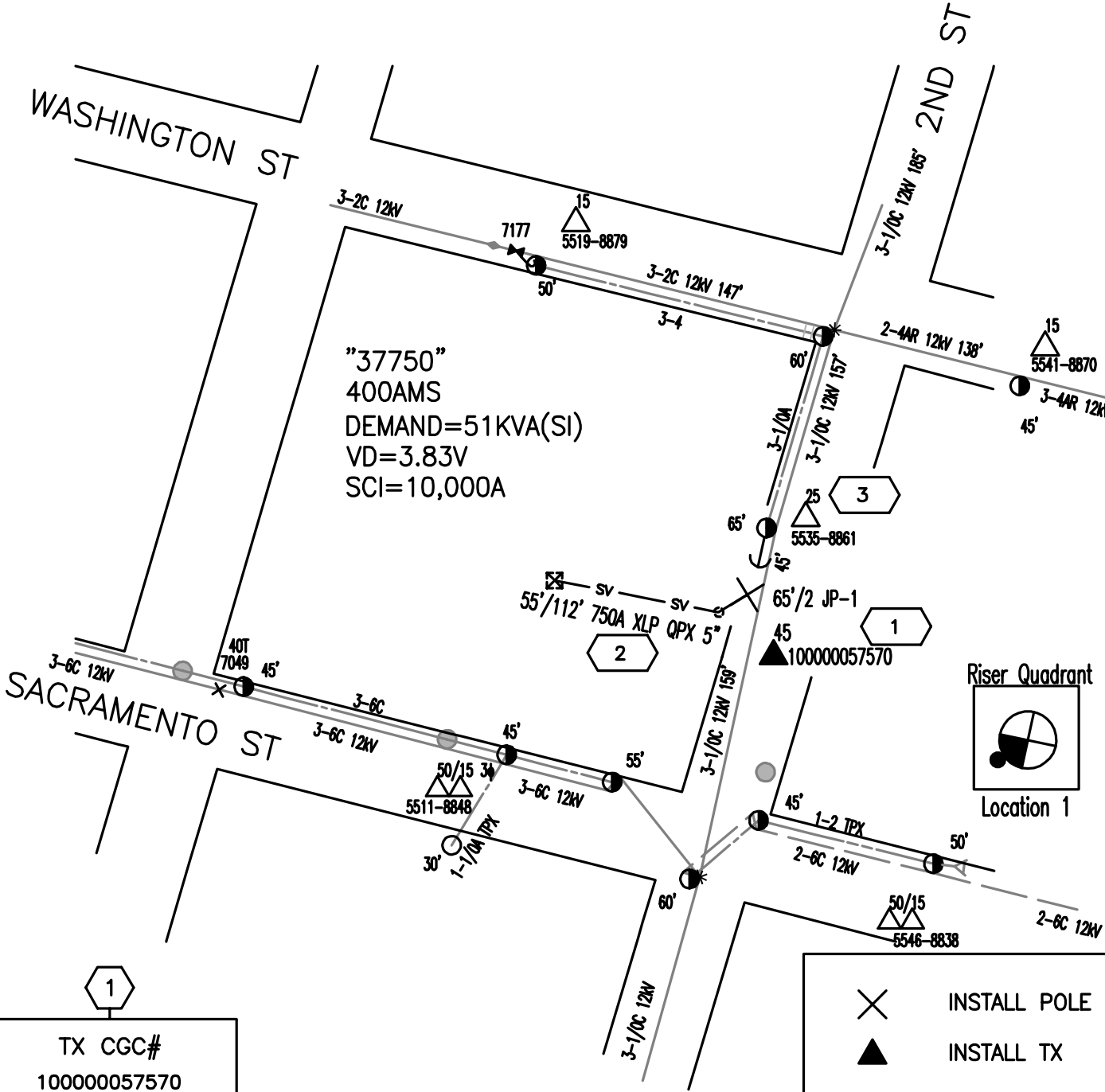
CALL (408) 755-3614 48 HR.S MIN. IN ADVANCE FOR TRENCH INSPECTION.

CALL 1-800-227-2600, UG. SERVICE ALERT TWO DAYS BEFORE YOU DIG.

CONSTRUCTION NOTES:

- APPLICANT TO TRENCH, INSTALL CONDUIT, AND BACKFILL.
 - APPLICANT TO INSTALL TRENCH PER DOCUMENT:S5453, EXHIBIT B.
 - APPLICANT TO INSTALL CONDUIT PER DOCUMENT:#038193, 062288, & 063927.
 - APPLICANT TO INSTALL TERMINATION FACILITIES PER PG&E DOCUMENT:#058817
 - PG&E TO USE APPROVED MATERIALS PER PG&E DOCUMENT:#066211
- ELECTRIC & GAS SERVICE REQUIREMENTS(GREENBOOK)

www.pge.com/greenbook



LOC-1 NR16
SET 65'-2 JP-1
SET 9.5FT DEEP
8'COMP TANGENT 3WIRE
RAPTOR GUARD
45KVA 3Ø 120/208V
PT44H 6T

LOC-2 NR16
INSTALL 55'/112' 750A XLP QPX 5"

LOC-3 BETTERMENT
REPLACE XARM
8'COMP TANGENT 3WIRE
RAPTOR GUARD
PT44H 6T

CONSTRUCTION SKETCH
37750 Sacramento St
Yolo

HIGH FIRE
THREAT
DISTRICT:TIER1

JOINT POLE DATA	
1	JP.AUTH.# PG200151PZ
WORK FUNCTION: JP#_ 1	ATTACHMENTS: PG&E:_ 55-24
PG&E:_	Safety Zone: 6
Other:_	Other:_ 25-7

TX CGC# 100000057570
LOADING DISTRICT Summer Interior
TX SIZE - 45KVA
KVA 1Ø -
KVA 3Ø - 51KVA
% L.F. - 75%

X	INSTALL POLE
▲	INSTALL TX
sv	INSTALL 750AL XLP QPX 600V(240V) BY PG&E IN 5" CONDUIT COMPLETION BY APPLICANT

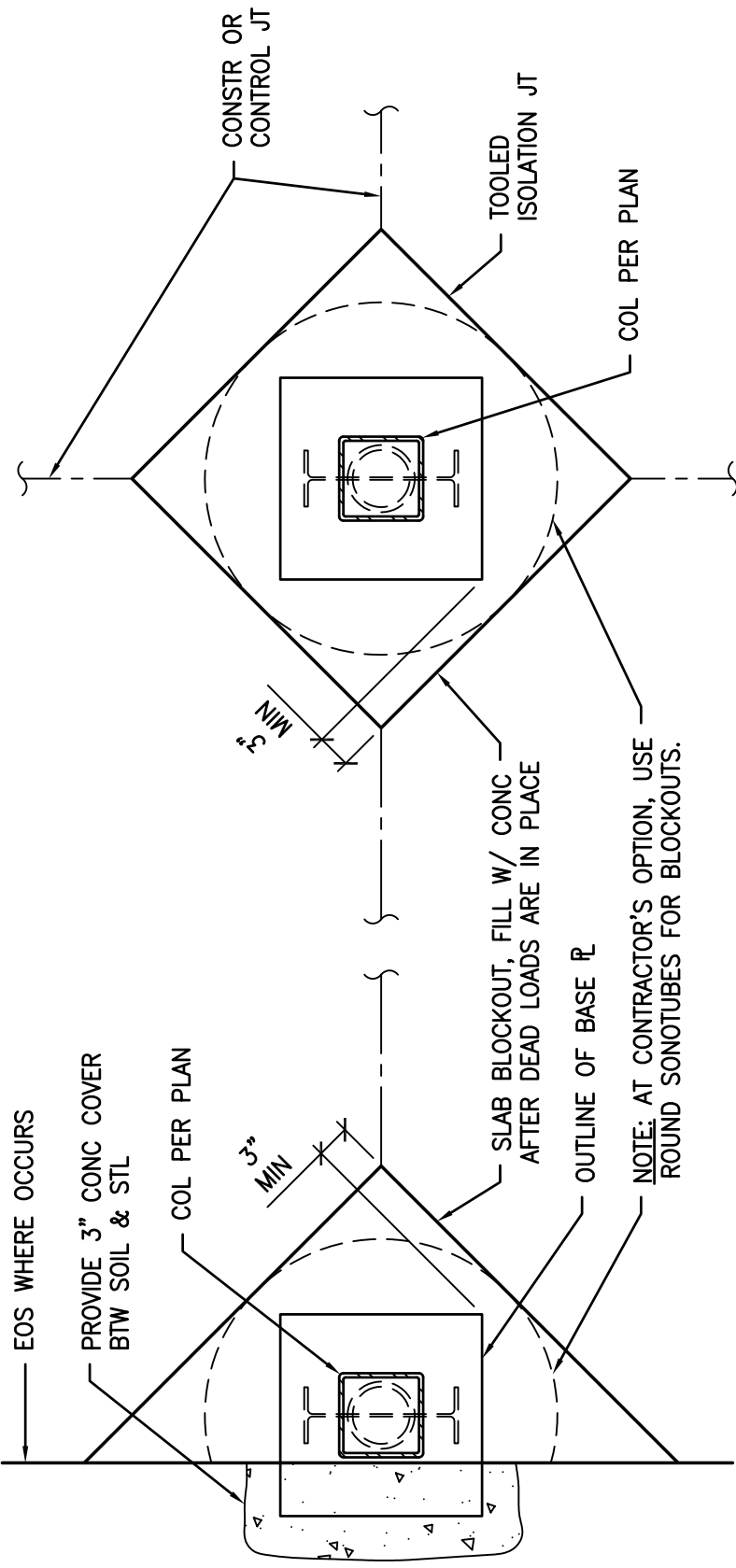
PRIMARY VOLTAGE: 12 kV	VOLTAGE AREA: 3	EST: David Gardner (916)760-2915
LATITUDE: 38.733263	LONGITUDE: -121.80728	ADE: Alan Woodard (916)760-1975
SOURCE SIDE DEVICE: 7177		SUPV: Michael Kartz (916)760-1981
SUB & CIRCUIT: ZAMORA 1107		REP: Emily Pearson (916)760-2966
DSGN SAG: Light-Rural	RAPTOR ZONE: Yes	PLNR:
LOADING AREA: Light	ARRESTER DIST: 2	NOTIF: 118246172
CORROSION AREA: Non	INSULATION DIST: D	SCALE: 1:100
EXEMPT EQUIP. INST: N/A	FIRE AREA: LRA-TIER 1	DATE: 6/30/2020
		PM: 35180356
		SHEET: 1 OF 1 REV.
		JPA#: PG200151PZ
		NO ENVIRONMENTAL ISSUES
		NEAR LOC:
		Know what's below. Call before you dig.
		811



NOTE:
WELD NOT REQ AT RADIUS CORNERS
OF SQ OR RECTANGULAR HSS.

COLUMN BASE PLATE SCHEDULE						
COL SIZE	AB DIA	BASE ϕ OVERSIZED HOLE DIA	ϕ WASHER W/ STD SIZE HOLE	BASE ϕ THICKNESS "t"	"a"	WELD SIZE "w"
HSS5x5	3/4"	15/16"	1/4"x2 1/2" SQ	1"	1 1/2"	1/4"

HSS COL BASE PLATE ANCHORAGE



CONDITION AT SLAB INTERIOR

CONDITION AT SLAB EDGE

SLAB COL BLOCKOUT

ADDENDUM #003

Date: June 24, 2021
(16) pages including attachments

LIST OF ADDENDUM ITEMS:

<u>Item</u>	<u>Description</u>	<u>Attachment</u>	<u>No. pages</u>
1.	<u>CHANGE IN BID DELIVERY LOCATION</u> The Notice to Bidders (00 12 00) shall be amended to require sealed bids to be delivered to the following location prior to 2:00PM on Tuesday, June 29, 2021: <u>Yolo County Purchasing Department</u> <u>625 Court Street, Room 103</u> <u>Woodland, CA 95695</u>	None	0
2.	The first sentence under §21 of Instructions to Bidders 00 20 00 in the Project Manual shall be amended to read: 21. Any bid protest must be submitted in writing to the Project Manager, before 5 p.m. of the FIFTH business day following ~~bid opening~~ <i>the posting of the Intent to Award on BidSync.</i>	None	0
3.	Document 00 45 00 'Bidder Information Sheet' is referenced from the 'Instructions to Bidders' (00 20 00) but was not included in the Project Manual. This document is attached to the Addendum and shall be completed and submitted with Contractor's Bid in accordance with the Instructions to Bidders.	Bidder Information Sheet 00 45 00	3
4.	Revised Bid Form is attached providing for acknowledgement of all three Addenda and listing Bidder Information Sheet (00 45 00) as a required submittal document that must accompany Contractor's Bid.	Bid Form 00 41 00 (revised)	4
5.	In response to Bid Question requesting a list of County-approved Backflow Testers: The Backflow Tester must be listed on one of the following approved tester lists in order to perform testing for this project: City of Woodland City of West Sacramento City of Davis Approved tester lists from these agencies are attached to this Addendum.	Approved Tester Lists from Cities of Woodland, West Sacramento, and Davis	7

<u>Item</u>	<u>Description</u>	<u>Attachment</u>	<u>No. pages</u>
6.	The following clarification is being issued in response to this Bid Question: <i>On the Subcontractor List, can the bid price and full mailing address for each sub be submitted by the low bidder 24 hours after the bid opening?</i> Response from the County: The County will follow Public Contract Code Section 4104. Bids must contain the name, location of the place of business, CSLB number, DIR number of each subcontractor that will perform work in an amount in excess of one-half of one percent of the prime contractor's bid (0.5%). The County will allow other required information about the subcontractor to be submitted up to 24 hours after the bid submittal deadline.	None	0
7.	The following clarification is being issued in response to this Bid Question: <i>Can the labor requirements for sub-contractor participation in Skilled & Trained be more clearly defined. Is it only necessary for specific trades? Which trades if so?</i> Response from the County: Subcontractors participating in this project are not subject to Skilled & Trained Worker requirements. Subcontractors are still obligated to meet the requirements of Labor Code 1777.5.	None	0

END OF ITEMIZED ADDENDUM LIST

ATTACHMENTS FOLLOW:

Bidder Information Sheet 00 45 00 – 3 pages (reference Item 3)

Revised Bid Form 00 41 00 – 4 pages (reference Item 4), dated 06/24/2021

City of Woodland Certified Testers List – 4 pages (reference Item 5), dated 06/01/2021

City of West Sacramento Certified Backflow Tester List – 2 pages (reference Item 5), dated 3/10/2021

City of Davis Certified Backflow Testers List – 1 page (reference Item 5), dated May 2021

(Bidder to attach additional sheets as necessary)

SECTION 00 45 00

BIDDER INFORMATION SHEET

Bidder must check one of the following classifications which 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 a 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) _____

DIR Registration No.: _____

(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 addenda 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
Affidavit 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

Name of Firm

SECTION 00 41 00

BID FORM

Project: Yolo Branch Library, 37750 Sacramento Street, Yolo, California

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 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).

Addendum #	Issue Date	Bidder's Acknowledgement (initials)
Addendum #1	June 16, 2021	
Addendum #2	June 22, 2021	
Addendum #3	June 24, 2021	

- (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 00700 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:

Base Bid Total Price for the Yolo Branch Library Project

\$ _____

(written)

Dollars

Enclosed find Bidder's Bond, certified check or cashier's check No. _____ of the
_____ (Company/Bank), for \$ _____.

Dated this _____ day of _____, 2021

Unit Pricing

Off-haul and disposal of unsuitable soil (no haz mat), per cubic yard: \$ _____

Import of engineered fill, per cubic yard: \$ _____

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 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 (Contract).
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 (Agreement).
12. The undersigned herewith encloses the completed Non-Collusion Affidavit – 00 45 10.
13. The undersigned herewith encloses the completed DAS Form 7 – 00 45 26.
14. The undersigned herewith encloses the completed Bidder Information Sheet – 00 45 00.

15. 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



Water Department Water Service Area Certified Testers List Fiscal Yr. '20-'21

(Last Updated 06/01/2021)

<u>Tester's Name</u>	<u>Tester's Contact Information</u>	<u>AWWA or NCBPA Expiration Date</u>	<u>Business License Expiration Date</u>	<u>Calibration Report Expiration Date</u>
Sam Ferry	Sam Ferry Backflow Tester 1410 Willow Springs Drive Woodland, CA 95776 Telephone: (530) 668-1211 FAX: (530) 668-1211	10/31/2021	11/30/2021	07/14/2021
Glenn Thornton	Glenn Thornton Plumbing 5405 Dorset Way Sacramento, CA 95822 Telephone: (916) 441-4387 Fax: (916) 441-1676	08/31/2022	01/31/2022	05/11/2022
Nathan Passantino	AP Plumbing & Fire Inc. P.O. Box 292 Woodland, CA 95776 Telephone: (530) 666-2612 FAX: (530) 666-9362	12/31/2022	04/30/2022	08/04/2021
Juan Aguilar	Glenn Thornton Plumbing 5405 Dorset Way Sacramento, CA 95822 Telephone: (916) 441-4387 FAX: (916) 441-1676	02/28/2023	01/31/2022	06/18/2021
Lynn Christensen	PDQ Water.com 216 "F" Street Davis, CA 95616 Telephone: (530) 756-7084 Email: Lynn@pdqwater.com	04/30/2024	05/31/2022	11/23/2021
Matt Spellman	River City Fire Equipment Co., Inc. 2419 Sellers Way West Sacramento, CA 95691 Telephone: (916) 351-4311 FAX: (916) 374-0812	09/30/2021	07/31/2021	12/21/2021
Jon Lotito	All Pro Backflow P.O. Box 2193 Folsom, CA 95630 Telephone: (916) 276-7162	12/31/2023	01/31/2022	06/30/2021
Stephen LeDoux	LeDoux Backflow Testing Services P.O. Box 195 Orangevale, CA 95662 Telephone: (916) 826-8202 FAX: (916) 984-5275	02/28/2022	03/31/2022	03/02/2022
Brian Rohl	All Pro Backflow P.O. Box 2193 Folsom, CA 95630 Telephone: (916) 276-7162	08/31/2022	01/31/2022	08/21/2021



Water Department Water Service Area Certified Testers List Fiscal Yr. '20-'21

(Last Updated 06/01/2021)

<u>Tester's Name</u>	<u>Tester's Contact Information</u>	<u>AWWA or NCBPA Expiration Date</u>	<u>Business License Expiration Date</u>	<u>Calibration Report Expiration Date</u>
Dan Scott	Backflow Technologies 4300 82nd St #1 Sacramento, CA 95826 Telephone: (916) 739-0547	08/31/2021	04/30/2022	04/15/2022
Jason Paron	Firecode Safety Equipment, Inc. 3722 West Pacific Ave Sacramento, CA 95820 Telephone: (916) 456-5561	07/31/2021	12/31/2021	09/10/2021
Chris Jaeger	Chris Jaeger Construction & Testing 1144 Jones Rd Yuba City, CA 96991 Telephone: (530) 682-0807	09/30/2022	06/30/2021	10/21/2021
Art Castillo	Castillo Plumbing 1744 El Paseo Dr. Woodland CA 95695 Telephone: (916) 870-6125	11/30/2022	04/30/2022	07/14/2021
Gary Christensen	PDQ Water.com 216 "F" Street Davis, CA 95616 Telephone: (530) 756-7084	02/22/2023	05/31/2022	02/25/2022
David J. Walters	ABC Plumbing 205 22ND Street Sacramento, CA 95618 Telephone: (916) 448-0801 Fax: (916) 448-3952	02/28/2022	01/31/2022	07/15/2021
John Lenakakis	LeDoux Backflow Testing Services P.O. Box 195 Orangevale, CA 95662 Telephone: (916) 826-8202 FAX: (916) 984-5275	10/31/2022	03/31/2022	04/21/2022
Scott Barrett	Barrett Backflow Testing 19380 County Rd 98 Woodland, CA 95695 Telephone: (530) 304-9943	05/31/2024	06/30/2021	05/20/2021
Donald Gordon	Legacy Fire Protection, Inc. 1 Blue Sky Ct Sacramento, CA 95828 Telephone: (916)-330-4233	05/31/2023	05/31/2022	06/19/2021
Jason Balukoff	JB Backflow Service 11959 Hobday Rd Wilton, CA 95693 Telephone: (209) 642-5953	01/31/2023	09/30/2021	04/23/2021



Water Department Water Service Area Certified Testers List Fiscal Yr. '20-'21

(Last Updated 06/01/2021)

<u>Tester's Name</u>	<u>Tester's Contact Information</u>	<u>AWWA or NCBPA Expiration Date</u>	<u>Business License Expiration Date</u>	<u>Calibration Report Expiration Date</u>
<i>Clint Robertson</i>	Robertson's Backflow 3170 Deep Haven Rd Pollock Pine, CA 95726 Telephone: (530) 306-1056	06/30/2023	11/30/2021	01/22/2022
<i>Laszlo Kramer</i>	AAA Backflow Prevention Inc. 4949 Nadotti Rd. Stockton, CA 95215 Telephone: (209) 931-5253 FAX: (209) 931-1916	02/28/2022	03/31/2022	07/08/2021
<i>Justin Bastedo</i>	River City Fire Equipment Co., Inc. 2419 Sellers Way West Sacramento, CA 95691 Telephone: (916) 351-4311 FAX: (916) 374-0812	01/31/2022	07/31/2021	11/10/2021
<i>Joseph Dutilly</i>	Firecode Safety Equipment, Inc. 3722 West Pacific Ave Sacramento, CA 95820 Telephone: (916) 456-5561	11/30/2021	12/31/2021	07/27/2021
<i>Jesse Flores</i>	Backflow Technologies 4300 82nd St #1 Sacramento, CA 95826 Telephone: (916) 739-0547	07/31/2022	04/30/2022	10/21/2021
<i>William Haynes</i>	Stead Backflow Prevention Svcs, Inc. 2715 W Kettleman Lane #203-321 Lodi, CA 95242 Telephone: (209) 351-0534	08/31/2021	10/31/2021	10/20/2021
<i>Dana MacLean</i>	California Backflow Testing 2032 Nicklaus Cir Roseville, CA 95678 Telephone: (916) 773-2055	01/31/2024	06/30/2021	01/13/2022
<i>Marc Rubald</i>	Village Backflow Prevention Service P.O. Box 72574 Davis, CA 95617 Telephone: (530) 756-8952	12/31/2022	02/28/2022	10/06/2021
<i>Richard Mathieu</i>	Richard's Dependable Backflow & Plumbing 3516 Eisenhower Dr Sacramento, CA 95826 Telephone: (916) 248-3275	10/31/2022	04/30/2022	05/04/2021
<i>Jed Rinne</i>	All Pro Backflow P.O. Box 2193 Folsom, CA 95630 Telephone: (916) 276-7162	01/31/2022	01/31/2022	01/23/2022



Water Department Water Service Area Certified Testers List Fiscal Yr. '20-'21

(Last Updated 06/01/2021)

<u>Tester's Name</u>	<u>Tester's Contact Information</u>	<u>AWWA or NCBPA Expiration Date</u>	<u>Business License Expiration Date</u>	<u>Calibration Report Expiration Date</u>
Ben Cox	Air Systems of Sacramento, Inc. 10381 Old Placerville Rd #100 Sacramento, CA 95827 Telephone: (888) 504-2772	09/30/2022	02/28/2022	03/18/2022
Chad Ward	Pride Industries 10030 Foothill Blvd Roseville, CA 95747 Telephone: (916) 531-7425	06/30/2022	11/30/2021	07/21/2021
Rob Ngo	Century Lighting & Electric 12820 Earhart Ave Auburn, CA 95602 Telephone: (916) 531-7425	08/31/2023	12/31/2021	08/28/2021
Dustin Ring	Century Lighting & Electric 12820 Earhart Ave Auburn, CA 95602 Telephone: (916) 531-7425	08/31/2023	12/31/2021	10/15/2021
Matthew Hopkins	AAA Backflow Prevention Inc. 4949 Nadotti Rd. Stockton, CA 95215 Telephone: (209) 931-5253 FAX: (209) 931-1916	06/30/2022	03/31/2022	09/11/2021
Caleb Robertson	Robertson's Backflow 3170 Deep Haven Rd Pollock Pine, CA 95726 Telephone: (530) 306-1056	01/31/2023	11/30/2021	01/14/2022
Justin Fengel	Five Star Backflow Testing 5105 Otter Pond Way Rancho Cordova, CA 95742 Telephone: (916) 580-9834	04/30/2022	10/31/2021	01/14/2022
Dana McLean	CA Backflow Testing 2032 Nicklaus Cir Roseville, CA 95678 Telephone: (916)-316-1646	01/31/2024	06/30/2021	01/13/2022
Rene Romero	Romero Landscaping and Irrigation P.O. Box 1251 Tracy, CA 95378 Telephone: (209)-639-7017	02/29/2024	03/31/2022	01/06/2022

CITY OF WEST SACRAMENTO / CERTIFIED BACKFLOW TESTER LIST

This is a current list of [certified backflow testers](#) registered with the City of West Sacramento. No endorsement is made for any tester or company, however, due to State mandates, please choose someone from this list [OR](#) have your preferred tester contact our office.

THIS LIST IS IN ALPHABETICAL ORDER AND NOT IN ANY RANKING

<u>Contractor Name</u>	<u>Company Name</u>	<u>License #</u>	<u>Phone #</u>
Aguilar, Juan	Glenn Thornton Plumbing	12429	(916) 996-7496
Aldred, Andrew	Aldred Backflow	18108	(916) 599-6480
Barrett, Scott	Barrett Backflow Testing	16993	(530) 304-9943
Bastedo, Justin	River City Fire Equipment Co.	17337	(916) 374-8295
Cortez, Rick	R. C. Plumbing	01688	(916) 799-7975
Davis, Eric	Ramco Properties	16972	(916) 801-1964
Davis, Tyler	Davis Backflow Service	16036	(916) 214-6292
Dechev, Dimitar	Super Brothers Plumbing, Heading & Air	17408	(916) 388-4014
Doan, Jesse	Cosco Fire Protection	18007	(916) 652-1306
Fengel, Joshua	Cosco Fire Protection	17967	(916) 652-1306
Fengel, Justin	Five Star Backflow	13338	(916) 580-9834
Ferry, Sam	Sam Ferry Backflow Tester	11409	(530) 668-1211
Flores, Jesse	Backflow Technologies	17567	(916) 739-0544
Gordon, Donald	Legacy Fire Protection, Inc.	16550	(916) 612-3056
Green, James	Bill's Backflow Service	07503	(916) 652-0345
Howden, James	Robertson's Backflow	16900	(530) 306-1056
Jaeger, Chris	Chris Jaeger Testing	05519	(530) 682-0807
Johnson, Dale	Cosco Fire Protection, Inc	16820	(916) 652-1306
Kasper, George	Armstrong Plumbing	16844	(916) 641-0886
Keddy, Daniel	The Backflow Guy, Inc	15884	(877) 384-3489
Kramer, Laszlo	AAA Backflow Prevention, Inc.	15971	(877) 226-3569
Laidlaw, David	Wave Plumbing and Construction	06307	(530) 878-9923
Larsen, Jeff	Jeffs Backflow Service	11787	(209) 639-2921
LeDoux, Ryan	Ryan LeDoux Backflow Testing & Repair	10499	(916) 440-6702
LeDoux, Stephen	LeDoux Backflow Testing Services	07860	(916) 826-8202
Lotito, Jon	All Pro Backflow, Inc.	12508	(916) 276-7162
Maria-Hopkins, Matthew	AAA Backflow Prevention, Inc.	17517	(877) 226-3569
Mathieu, Richard	Richard's Dependable Backflow Testing	10458	(916) 248-3275
Paron, Jason	Firecode Safety Equipment, Inc.	15735	(916) 456-5561
Penny, Walter	Walt's Backflow Service	10436	(916) 470-0120
Perkins, Thomas	Thomas Perkins	10461	(916) 202-8245
Prather, Mitch	C&M Backflow Testing and Repair	03099	(916) 783-7176
Reyes, Joseph	Sameday Backflow Service	07863	(209) 986-3569
Rinne, Jed	All Pro Backflow, Inc.	17335	(916) 276-7162
Robertson, Clinton	Robertson's Backflow	13876	(530) 306-1056
Rohl, Brian	All Pro Backflow, Inc	14926	(916) 276-7162

Rubald, Marc	Village Backflow Prevention Service	04086	(530) 756-8952
Scott, Dan	Backflow Technologies Inc	09879	(916) 739-0544
Simmons, Derald	Mark III Construction	16997	(916) 381-8080
Spellmon, Matt	River City Fire Equipment Company	14560	(916) 374-8295
Taylor, Cecil	Simplex Grinnell	15583	(916) 995-3867
Thornton, Glenn	Glenn Thornton Plumbing Inc	02100	(916) 441-4387
Tuck, Gary	Plumbing Service Company	09417	(916) 455-3171
Valenzano, Randy	Plumbing Service Company	01607	(916) 455-3171
Walters, David	ABC Plumbing Heating and Air	11594	(916) 448-0801
Zippran, Brett	Certified Safe Backflow Testing & Repair	17253	(916) 350-1484



PUBLIC WORKS DEPARTMENT
1717 5TH Street, Davis, CA 95616
Phone: (530) 757-5686
E-Mail: mholden@cityofdavis.org

Certified Backflow Testers List
MAY 2021

BUSINESS	NAME	ADDRESS	CITY/STATE/ZIP	PHONE #
ABC Plumbing, Heat & Air	David Walters	205 22nd Street	Sacramento, CA 95816	(916) 448-0801
Richards Depenable backflow	Richard Mathieu	3516 Eisenhower Drive	Sacramento CA 95826	(916)248-3275
Air System Service Company	William Bartacchi	10381 Old Placerville rd su 100	Sacramento CA 95827	(916)368-0336
AAA Backflow Prevention Service	Jorden Lee	4949 East Nadotti Road	Stockton CA 95215	(209)931-5253
AP Plumbing	Nathan Passantino	P.O. Box 292	Woodland, CA 95776	(530) 666-2612
Backflow Technologies	Dan Scott	4300 82nd Street	Sacramento, CA 95826	(916)739-0547
Barrett Backflow Testing	Scott Barrett	19380 County Road 98	Woodland,CA 95695	(530)304-9943
C & M Backflow Testing & Repair	Mitch Prather	3002 Springview Meadows Dr	Rocklin, CA 95766	(916) 783-7176
Cosco Fire Protection	John T Stobb	4233 W.Sierra Madera Ste 108	Fresno CA 93722	(916)652-1306
Chris Jaeser Testing	Chris Jaeser	PO BOX 1300	Yuba City CA 95992	(530)682-0807
Five Star Backflow Services	Justin Fenger	PO Box 340519	Sacramento, CA 95834	(916)580-9834
Glenn Thornton Plumbing	Glenn Thornton	5405 Dorset Way	Sacramento, CA 95822	(916) 441-4387
Glenn Thornton Plumbing	Juan Aguilar	5405 Dorset Way	Sacramento, CA 95822	(916) 441-4387
James Water Service Co.	James Whitaker	116 Broadview Lane	Winters, CA 95694	(530) 902-4805
Preferred Plumbing	Paul Fenczik	3437 Myrtle ave STE 440	North Highlands CA 95660	(925)677-0900
John’s Backflow Tech & Service	John Barber	179 North Park Dr	Vacaville, CA 95688	(707) 205-9397
PDQ Water.Com	Lynn Christensen	216 F Street	Davis, CA 95616	(530) 756-7084
PDQ Water.Com	Gary Christensen	216 F Street	Davis, CA 95616	(530) 756-7084
Plumbing Service Company	Randy Valenzano	6400 Elvas Avenue, Suite B	Sacramento, CA 95819	(916) 455-3171
Cosco Fire Protection	Joshua Fengel	4320 Anthony Ct.Ste B	Rocklin CA 95677	(916)652-1306
Stephen LeDoux Certified Backflow	Ramiro Cuevas	PO BOX 195	Orangevale, CA 95662	(916) 455-3171
River City Fire	Matt Spellman	2419 Sellers Way	west Sacramento, CA 95691	(916) 374-8295
River City Fire	Justin Bastedo	2419 Sellers Way	west Sacramento, CA 95691	(916) 374-8295
Stead Backflow Prevention	Bryant Brogren	4555 N. Pershing Ave, #33-141	Stockton, CA 95203	(800) 640-5171
Stephen LeDoux Certified Backflow	Stephen LeDoux	P.O. Box 195	Orangevale, CA 95662	(916) 826-8202
Thorpe Design	Michael Faria	410 Beatrice Ct, Suite A	Brentwood, CA 94513	(925)766-0849
Village Backflow	Marc Rubald	413 Merganser Place	Davis, CA 95616	(530) 756-8952
Wave Plumbing	David Laidlaw	P.O. Box 1231	Meadow Vista, CA 95722	(800) 836-4671
All Pro Backflow	Jon Lotito	P.O.box 2193	Folsom CA 95763	(916)276-7162
Express Sewer & Drain	Jason Maduri	3303 Luyung Dr	Rancho Cordova CA	(916)842-3142
Backflow Wizard	Jeovani Benavidez	3738 Naturita Way	Sacramento,CA 95834	(916)539-9382
Acco Engineered Systems,INC	Alexandra Engleking	9290 Beatty Drive	Sacramento, CA 95826	(916)275-8934
Preferred Plumbing	Michael Harrell	3437 Myrtle Avenue	North Highlands CA 95660	(916)666-3193
SacVal Plumbing/United valley inc	Ruslan Gidenko	8121 Industrial Prwy	Sacramento CA 95824	(916)452-9687
C & M Backflow and Repair, Inc	Tyler Davis	PO BOX 901	Rocklin, CA 95677	(916) 214-6292
Certified Safe Backflow Testing and	Bret Zipprian	PO BOX 2472	Rocklin CA 95677	(916)350-1484
Air System Service Company	Derek Ivy	10381 Old Placerville rd su 100	Sacramento CA 95827	(916)340-5773
Super Brothers Plumbing Heating &	Dimitar Dechev	7475 Kanai Ave	Citrus Heights CA	(916)388-4014
LeDoux Backflow Testing Services	Yianni Lenakakis	PO Box 195	Orangevale, Calif 95662	(916)826-8202
Air Systems Services Construcion	Ben Cox	10381 Old Placerville Road	Sacramento, CA 95827	(916) 414-0338
Plumbing Services Company	Marcos Almeida	6400 Elvas Avenue, Suite B	Sacramento,CA 95819	(916)455-3171
Johnson Controls Fire Protection	Cecil Taylor	4650 Beloit Dr.	Sacramento,CA 95838	(916)283-0300
Cosco Fire Protection	Jesse Doan	4320 Anthony Ct.Ste B	Rocklin CA 95677	(916)652-1306

NOTE: THE ASSEMBLY OWNER SHOULD BE AWARE THAT A CONTRACTOR HAS PROPER INSURANCE COVERAGE.
A BACKFLOW ASSEMBLY CREATES A CLOSED SYSTEM AND SHOULD ONLY BE INSTALLED BY A QUALIFIED PLUMBER



County of Yolo

Department of General Services
Facilities Division

Kevin Yarris
DIRECTOR

120 West Main Street, Suite D
Woodland, CA 95695

(530) 406-8114
www.yolocounty.org

CONTRACT CHANGE ORDER NO.

Page: 1 of X

Federal Project No. N/A

W.O. No. #X

Project: YOLO COUNTY LIBRARY ROJECT

Location: 37750 Sacramento Street, Yolo CA 95697

Date:

To: **Broward Builders, Inc.** You are hereby directed to make the herein described changes from the PLANS and SPECIFICATIONS or do the following described WORK not included in the PLANS and SPECIFICATIONS on this CONTRACT.

Change requested by: CONTRACTOR

Initial Contract Amt: \$ CO's to date: \$ this CCO: \$ New Encumbered Amount: \$

DESCRIPTION OF WORK

(Estimate of quantities and prices shall be included herein)

Perform the following changes to the WORK. This Contract Change Order will be on a **Lump Sum Price** basis as specified in Section 4.3 of the GENERAL PROVISIONS:

The following table(s) summarizes the change in CONTRACT PRICE:

Item	Bid Item Description	Date Requested	Quantity	Unit	Unit Price	Net Change
1						
2						
3						
4						
TOTALS						

See attached Request for Change Order # submitted by **Broward Builder, Inc.** and Attachment # for a detailed breakdown.

Justification:

By reason of this proposed change, _ working days extension of time will be allowed.

Contractor:

CONTRACTOR accepts the terms and conditions stated above as full and final settlement of any and all claims arising out of or related to the subject of this CONTRACT CHANGE ORDER and acknowledges that the compensation (time and cost) set forth herein comprises the total compensation due for the work or change defined in the CONTRACT CHANGE ORDER, including all impact on any unchanged work. By signing this CONTRACT CHANGE ORDER, the CONTRACTOR acknowledges and agrees that the stipulated compensation includes payment for all work contained in the CONTRACT CHANGE ORDER, plus all payment for any acceleration or interruption of schedules, extended overhead costs, delay, and all impact or cumulative impact on all WORK under this CONTRACT. The signing of this CONTRACT CHANGE ORDER acknowledges full mutual accord and satisfaction for the change and that the stated time and/or cost constitute the total equitable adjustment owed the CONTRACTOR as a result of the change. The CONTRACTOR hereby releases and agrees to waive all rights, without exception or reservation of any kind whatsoever, to file any further claim or request for equitable adjustment of any type, for any reasonably foreseeable cause that shall arise out of, or as a result of, this CONTRACT CHANGE ORDER and/or its impact on the remainder of the WORK under the CONTRACT.

APPROVED BY: _____ Date: _____
Broward Builders, Inc

APPROVAL
RECOMMENDED BY: _____ Date: _____
Gene Wais , Project Manager

APPROVED: _____ Date: _____
Kevin Yarris, Director

NOTE: This change order is not effective until approved by the Director of General Services Department, Facilities Division.

COPY TO: Contractor -1, GSD -1

Approved as to Form:

By: _____
Philip J Pogledich, County Counsel