COUNTY OF YOLO

COMMUNITY SERVICES DEPARTMENT
DIVISION OF INTEGRATED WASTE MANAGEMENT
44090 COUNTY ROAD 28H
WOODLAND, CA 95776
(530) 666-8852

PLANS AND SPECIFICATIONS

FOR
CONSTRUCTION OF THE EXTRACTION WELL PIPELINES

NOT FOR CONSTRUCTION

at the

YOLO COUNTY CENTRAL LANDFILL
YOLO COUNTY, CALIFORNIA

DECEMBER 7, 2021

Yolo County Community Services Department
Division of Integrated Waste Management
Ramin Yazdani, Director

Bid Opening: JANUARY 18, 2022 @ 2PM
Yolo County Central Landfill Administration Conference Room
44090 County Road 28H
Woodland, CA 95776

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I certify that this project was designed by me or under my direction in accordance with generally accepted engineering practices

Monte Christie, P.E. C58866, GE 2630

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County of Yolo

State of California

Community Services Department

Division of Integrated Waste Management

Notice To Contractors

Sealed proposals for the project to be constructed at the Yolo County ("County") Central Landfill, entitled:

CONSTRUCTION OF THE EXTRACTION WELL PIPELINES

Shall be submitted by hard copy at the Yolo County Central Landfill, 44090 County Road 28H, Woodland, California 95776 no later than: **JANUARY 18, 2022 @ 2PM** at which time they will be publicly opened and read in the Yolo County Central Landfill Conference Room at the above address.

There will be a pre-bid meeting at **2PM on JANUARY 4, 2022** at the Yolo County Central Landfill, located at 44090 County Road 28H, Woodland. Directions to the Yolo County Central Landfill can be found at:

http://www.yolocounty.org/community-services/planning-public-works/integrated-waste-management-division/central-landfill#Directions

General work description: The project is located at the Yolo County Central Landfill, bounded by County Road 104 on the west and County Road 28H on the south, approximately three (3) miles northeast of the City of Davis. (See location map on cover sheet of Plans).

Yolo County Central Landfill
44090 County Road 28H
Woodland, CA 95776

Normal operating hours are Monday through Saturday 6:30 a.m. to 4:00 p.m., and Sunday 8:00 a.m. to 4:00 p.m. The work to be performed under this contract consists of furnishing all equipment, materials, and tools; performing all required labor; and completing all work necessary for the construction of the following:

> **CONSTRUCTION OF THE EXTRACTION WELL PIPELINES** which includes the installation of two parallel pipelines; as well as connections to the existing groundwater extraction wells and air stripper facility.

BID SCHEDULE

Item No.	Description	Section Reference (1)	Estimate Quantity	Unit
1	Mobilization/Demobilization	11-6	1	LS
2	Prepare and Implement Drainage and Erosion Control Plan	11-6	1	LS
3	Well connections and wellhead piping modifications	11-6	11	EA
4	6in HDPE Piping	Greenbook 306-15.1	7,712	LF
5	6in resilient wedge gate valve, box, and cover	Greenbook 306-15.5	4	EA

(1) The Section Reference corresponds with the Section number within the Technical Provisions where the measurement and payment is described.

The foregoing quantities are approximate only, being given as a basis for the comparison of bids, and the County does not expressly or by implication agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of work, or to omit portions of work, as may be deemed necessary or advisable by the ENGINEER.

Bidder shall possess a valid A license and DIR number in order to submit a bid. If necessary, subcontractor's may be used to meet the license requirements necessary to complete the project in accordance with Business and Professions Code section 7059(b). The bidder must be properly licensed from the time it submits its bid through contract acceptance in accordance with Business and Professions Code section 7000 et seq.

Proposals are required for the entire work described herein. The County reserves the right to reject any or all proposals or to waive any irregularities or informalities in any proposals or in the proposal process.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code section 12990.

Project plans, specifications, special provisions, proposal forms, and addenda for this project can be downloaded at no cost at www.bidsync.com. It is the bidder's responsibility to register at www.bidsync.com to ensure notification of all addenda. It is the bidder's responsibility to arrange for printing services to obtain printed copies of the bid documents.

The contract documents may be examined at the office of the Yolo County Central Landfill, and at the following locations:

Construction Bidboard, Inc.
McGraw-Hill Construction
Sacramento Builders' Exchange, Sacramento
El Dorado Builders' Exchange, Cameron Park

Questions must be submitted in writing through www.bidsync.com by 5pm January 6, 2022 Answers will be posted on www.bidsync.com by January 11, 2022. Every answer will constitute an addendum to the Specifications.

Inquiries or questions based on alleged patent ambiguity of the plans, specifications or estimate must be communicated as a bidder inquiry prior to bid opening. Any such inquiries or questions, submitted after bid opening, will not be treated as a bid protest.

The successful bidder shall furnish a payment bond and a performance bond, each in the full amount of the contract price. These bonds shall be executed by a surety specified in California Code of Civil Procedure Section 995.310.

The County affirms that in any contract entered into pursuant to this advertisement, all bidders will be afforded full opportunity to submit bids in response to this invitation and will not be

discriminated against on the grounds of race, color, or national origin in consideration for an award.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wage rates are set forth in the General Prevailing Wage Rates for this project, available for review at Yolo County Central Landfill, 44090 County Road 28H, Woodland, California and available from the California Department of Industrial Relations' internet web site at http://www.dir.ca.gov/DLSR/PWD. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the General Prevailing Wage Rate Determinations. The successful bidder shall post a copy of the prevailing wage rates at each job site. It shall be mandatory upon the bidder to whom the contract is awarded, and upon any subcontractors, to comply with all Labor Code provisions, which include but are not limited to the payment of not less than the said specified prevailing wage rates to all workers employed by them in the execution of the contract, employment of apprentices, hours of labor and debarment of contractors and subcontractors.

Pursuant to Labor Code section 1725.5 and 1771.3, contractors and subcontractors who intend to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No proposal will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. If awarded a contract, the bidder and its subcontractors, of any tier, shall maintain active registration with the Department of Industrial Relations for the duration of the project. Notwithstanding the foregoing, the contractor registration requirements mandated by Labor Code Sections 1725.5 and 1771.1 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Sections 1725.5 and 1771.1. Information is available at: http://www.dir.ca.gov/Public-Works/PublicWorks.html. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. In bidding on this project, it shall be the bidder's sole responsibility to evaluate and include the cost of complying with all labor compliance requirements under this contract and applicable law in its proposal.

No proposal will be received unless it is made on a proposal form furnished by Yolo County Department of Community Services, either by a hard copy or downloaded from the aforementioned bid exchanges or www.bidsync.com. Copies or facsimiles of the bidder's completed and executed proposal forms submitted as a proposal will be rejected. Each proposal must be accompanied by a certified check, cashier's check, or bidder's bond made payable to Yolo County for an amount equal to at least ten percent (10%) of the amount of proposal, such guaranty to be forfeited should the bidder to whom the contract is awarded fail to enter into the contract. If a bond is used, it must be signed by the bidder and by a signatory of an authorized surety company all as provided by law.

Pursuant to Public Contract Code section 22300, the successful bidder may substitute certain securities for funds withheld by the County to ensure its performance under the contract.

The engineers estimate for this project is $550,000

FORTY (40) working days are allowed for completion of the work.

Dated this _____day of _____ 2022.

Ramin Yazdani,

DIRECTOR,

DIVISION OF INTEGRATED WASTE MANAGEMENT

By:_____

PART 1 – GENERAL PROVISIONS OF THE CONSTRUCTION CONTRACT

SECTION 1 - DEFINITIONS AND TERMS

1-1 GENERAL

Whenever the following terms, titles, or abbreviations are used in these SPECIFICATIONS, or in any document or instrument where these SPECIFICATIONS govern, the intent and meaning shall be as herein defined.

Working titles have a masculine gender, such as "workman" and "journeyman" and the pronoun "he," are utilized in the SPECIFICATIONS for the sake of brevity, and are intended to refer to persons of either sex.

1-2 ABBREVIATIONS

AASHTO	**American Association of State Highway and Transportation Officials**
ACI	**American Concrete Institute**
AISC	**American Institute of Steel Construction**
AISI	**American Iron and Steel Institute**
APA	**American Plywood Association**
APWA	**American Public Works Association**
ASA	**American Standards Association**
ASME	**American Society of Mechanical Engineers**
ASTM	**American Society for Testing Materials**
AWS	**American Welding Society**
AWWA	**American Water Works Association**
CSI	**Construction Specifications Institute**
FS	**Federal Specifications**
NBFU	**National Board of Fire Underwriters**
NEC	**National Electrical Code**
NEMA	**National Electrical Manufacturer's Association**
NFPA	**National Fire Protection Association**
NSF	**National Sanitation Foundation**
OSHA	**Occupational Safety & Health Act**

Title 19	**Title 19 (Public Safety) of the California Administrative Code**
Title 24	**Title 24 (Building Standards) of the California Administrative Code**
UL	**Underwriters' Laboratories, Inc.**
UBC	**Uniform Building Code**
UMC	**Uniform Mechanical Code**
UPC	**Uniform Plumbing Code**

All references to the Specifications, standards, or other publications of any of the above are understood to refer to the current issue as revised or amended at the date of receipt of bids.

CF	**Cubic Foot**
CY	**Cubic Yard**
EA	**Each**
GAL	**Gallon**
LB	**Pound**
LF	**Lineal Foot**
LS	**Lump Sum**
MH	**Man Hours**
MI	**Mile**
SQFT	**Square Foot**
SQYD	**Square Yard**
STA	**Station**

1-3 DEFINITIONS

ADDENDA - Written or graphic Instruments issued prior to the opening of PROPOSALS which clarify, correct, or change the bidding documents or the CONTRACT DOCUMENTS.

AGREEMENT OR CONTRACT - The written agreement between the COUNTY and CONTRACTOR covering the WORK to be performed: Other CONTRACT DOCUMENTS are incorporated into the AGREEMENT and made a part thereof as provided therein.

AS SHOWN, ETC. - Where "as shown:," "as indicated," "as detailed," or words of similar import are used, it shall be understood that reference is made to the PROJECT DRAWINGS unless specifically stated otherwise. Where "as directed," "as permitted," "approved," or words of similar import are used, it shall be understood that the direction, permission, requirements, or acceptance of the ENGINEER is intended unless stated otherwise.

BASE - A layer of specified material of planned thickness placed immediately below the pavement or surfacing.

BASEMENT MATERIAL - The material in excavation or embankments underlying the lowest layer of subbase, base, pavement, surfacing or other specified layer which is to be placed.

BID AND BID FORM means PROPOSAL.

BIDDER - Any person, partnership, firm, or corporation submitting a PROPOSAL for the WORK contemplated, acting directly or through a duly authorized representative.

BOARD OF SUPERVISORS - Governing body of the COUNTY.

BONDS - Bid, performance, and payment bonds and other instruments of security.

CALENDAR DAY - Every day shown on the calendar, Sundays and holidays included. When the time for completion in the CONTRACT is set forth in CALENDAR DAYS or DAYS, each and every reference to WORKING DAYS in these CONTRACT DOCUMENTS shall be deemed to mean CALENDAR DAYS, unless specified otherwise.

CALTRANS - Department of Transportation, State of California.

CHIEF ENGINEER - Whenever the words "Chief Engineer" is used in the "State Specifications," they shall mean the Director of Community Services Department of the County of Yolo.

CONDUIT - A pipe or tube in which smaller pipes, tubes, or electrical conductors are inserted or are to be inserted.

CONSTRUCTION QUALITY ASSURANCE (CQA) INSPECTOR - The person or corporation responsible for observing and documenting activities related to quality assurance of WORK outlined in these CONTRACT DOCUMENTS, in accordance with the CQA Plan (defined below).

CONSTRUCTION QUALITY ASSURANCE PLAN (CQA PLAN) - Selected tests and observations made by an independent CONSTRUCTION QUALITY ASSURANCE (CQA) INSPECTOR to assure that the WORK, including the final product, complies with applicable regulations, standards, and CONTRACT DOCUMENTS. The CQA INSPECTOR shall perform under a separate contract with the COUNTY.

CONSULTING ENGINEER/ARCHITECT - Any person or persons, firm, partnership, or corporation legally authorized and licensed to practice Civil Engineering or Architecture in the State of California who prepares PLANS and SPECIFICATIONS for the DEPARTMENT, for approval.

CONTRACT DOCUMENTS - The CONTRACT DOCUMENTS shall include: The Notice to Contractors, all duly issued ADDENDA, PROPOSAL, PLANS, TECHNICAL PROVISIONS, AGREEMENT, BONDS, and STANDARD SPECIFICATIONS, including GENERAL PROVISIONS, SPECIAL PROVISIONS, STANDARD CONSTRUCTION SPECIFICATIONS and STANDARD DRAWINGS contained therein; also, any and all supplemental agreements amending or extending the WORK contemplated and which may be required to complete the WORK in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments or extensions to the CONTRACT and include CONTRACT CHANGE ORDERS.

CONTRACT CHANGE ORDERS - A supplemental written agreement which authorizes an addition, deletion or revision in the WORK, or an adjustment in the CONTRACT PRICE or the CONTRACT TIME, issued on or after the effective date of the AGREEMENT.

CONTRACT PRICE - The moneys payable by the COUNTY to the CONTRACTOR as stated in the AGREEMENT, as full compensation for the WORK, subject to any additions or deductions as provided in the CONTRACT DOCUMENTS, including all applicable taxes and cost.

CONTRACT TIME - The number of days or the date stated in the CONTRACT DOCUMENTS for the completion of the WORK, as may be adjusted by a CONTRACT CHANGE ORDER.

CONTRACTOR - The person, firm, or corporation with whom the COUNTY entered into the AGREEMENT.

CONTRACTOR'S REPRESENTATIVE OR SUPERINTENDENT - CONTRACTOR's representative at the site, who has authority to act on behalf of CONTRACTOR.

COUNTY - The County of Yolo, a public entity, existing under and by virtue of the laws of the State of California.

DAYS - Shall mean consecutive calendar days unless otherwise specified.

DEFECTIVE - An adjective which, when modifying the word WORK, refers to work that is unsatisfactory, faulty or deficient, or does not conform to the CONTRACT DOCUMENTS, or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the CONTRACT DOCUMENTS, or has been damaged prior to the date of ENGINEER's FIELD ACCEPTANCE LETTER.

DEPARTMENT- The Department of Community Services, Division of Integrated Waste Management, County of Yolo.

DESIGN ENGINEER or ARCHITECT - The engineer, architect, or firm engaged as an independent contractor by the COUNTY to design the PROJECT.

The authority of the DESIGN ENGINEER or ARCHITECT to monitor and review the WORK for the ENGINEER shall be strictly limited to that authority specified, and no additional authority has been granted, nor shall be inferred.

DETOUR - A temporary route for traffic around a closed portion of the road.

DIRECTOR - The Director of Community Services of Yolo County acting either directly or through the Chiefs of the appropriate Divisions of the Department or their authorized representatives.

DIVIDED HIGHWAY - A highway with separated traveled ways for traffic, generally in opposite directions.

DRAWINGS - See PLANS.

EFFECTIVE DATE OF THE AGREEMENT - The date indicated in the AGREEMENT on which it becomes effective, but if no such date is indicated to, means the date on which the AGREEMENT is signed and delivered by the last of the two parties to sign and deliver.

ENGINEER - The DIRECTOR acting either directly or through his properly authorized agents, designated by him in writing, such agents acting within the scope of the particular duties delegated to them.

ENGINEER'S ESTIMATE - The list of estimated quantities of WORK to be performed, as contained in the PROPOSAL FORM.

EXTRA WORK – New or unforeseen work not covered by the CONTRACT DOCUMENTS at bid time, as determined by the ENGINEER.

FEDERAL AGENCIES - Whenever, in the SPECIFICATIONS, reference is made to any Federal agency or officer, such reference shall be deemed made to any agency or officer succeeding in accordance with law to the powers, duties, jurisdiction, and authority of the agency or officer mentioned.

FEDERAL SPECIFICATIONS - The particularly designated standard specifications of the United States Government.

FIELD ACCEPTANCE LETTER - A letter issued to CONTRACTOR by the ENGINEER upon completion by CONTRACTOR of all the WORK, including PUNCH LIST items, to ENGINEER's satisfaction. The date of that letter will be commencement date of guaranty periods.

FIELD ORDER - A written order issued by ENGINEER which orders minor changes in the WORK but which does not involve a change in the CONTRACT PRICE or the CONTRACT TIME.

FIXED COSTS - Any necessary labor, material, and equipment costs directly expended on the item or items under consideration which remain constant regardless of the quantity of the WORK done.

GENERAL PROVISIONS or GENERAL PROVISIONS OF THE CONSTRUCTION CONTRACT - A part of CONTRACT DOCUMENTS, included in these STANDARD SPECIFICATIONS, set forth the conditions and requirements applicable to all construction contracts originated by the DEPARTMENT.

GRADING PLANE - The surface of the basement material upon which the lowest layer of subbase, base, pavement, surfacing, or other specified layer, is placed.

GREEN WASTE – Processed green material, ground yard waste (leave, grass, brush, etc.)

HIGHWAY - The whole right-of-way, or area which is reserved for, and secured for use in constructing the roadway and its appurtenances.

INSPECTOR - All persons employed by the COUNTY to be responsible to the ENGINEER, and under his direction, to inspect the WORK as the construction proceeds.

LABORATORY - The County of Yolo laboratory or the designated materials testing laboratory authorized by the DIRECTOR to test materials and WORK involved in the CONTRACT.

LEGAL HOLIDAYS - Those days designated as State holidays in the California Government Code.

LIQUIDATED DAMAGES - The amount prescribed in the CONTRACT DOCUMENTS pursuant to the authority of the California Government Code Section 53069.85, to be paid to the COUNTY or to be deducted from any payment due or to become due to the CONTRACTOR, for each CALENDAR DAY delay beyond the time allowed in the CONTRACT DOCUMENTS for completing the whole, or any specified portion of the WORK, or causing or allowing any disruption in the normal operations of the landfill as further described in Section 9-5 of the GENERAL PROVISIONS.

LITTER – Any garbage or trash encountered in the green waste or foundation layer soil during clearing and grubbing activities.

LOCAL AGENCY PUBLIC CONSTRUCTION ACT - Part 3, Chapter 1, of the California Public Contract Code. The provisions of this Act and other applicable laws form and constitute a part of the provisions of the CONTRACT DOCUMENTS to the same extent as if set forth therein in full.

MANUAL OF TRAFFIC CONTROLS - The State of California Department of Transportation publication entitled "Manual of Traffic Controls for Construction and Maintenance Work Zones."

NOTICE TO PROCEED - A written notice given by the DIRECTOR to CONTRACTOR fixing the date on which the CONTRACT TIME will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR's obligations under the CONTRACT DOCUMENTS.

PAVEMENT - The uppermost layer of material placed on the traveled way or shoulders. This term is used interchangeable with surfacing.

PLANS or DRAWINGS - The drawings which show the character and scope of the WORK to be performed and which have been approved by the DIRECTOR and are referred to in the CONTRACT DOCUMENTS. The PLANS being a part of the CONTRACT DOCUMENTS include the following whether or not reproduced in the TECHNICAL PROVISIONS:

(A) STANDARD DRAWINGS - The Yolo County Department of Community Services Standard Plans, as included in these STANDARD SPECIFICATIONS.

(B) PROJECT DRAWINGS - The plans listed as project drawings in the TECHNICAL PROVISIONS. These plans show specific layouts, profiles, typical cross-sections, sections, details and dimensions peculiar to the WORK, and supplemented by the STANDARD DRAWINGS insofar as the same may apply.

(C) Any other plans or drawings referred to in the TECHNICAL PROVISIONS, STANDARD CONSTRUCTION SPECIFICATIONS, STANDARD DRAWINGS or PROJECT DRAWINGS.

PROJECT - The total construction of which the WORK to be provided under the CONTRACT DOCUMENTS may be the whole, or part, as indicated elsewhere in the CONTRACT DOCUMENTS.

PROPOSAL - The offer of the BIDDER for the WORK when made out and submitted on the prescribed PROPOSAL FORM, properly signed and guaranteed.

PROPOSAL FORM - The approved form upon which the COUNTY requires formal bids be prepared and submitted for the WORK.

PROPOSAL GUARANTY - The cash, cashier's check, certified check, or bidder's bond accompanying the PROPOSAL submitted by the BIDDER, as a guaranty that the BIDDER will enter into a CONTRACT with the COUNTY for the performance of the WORK if the CONTRACT is awarded to him.

PUNCH LIST - A written list of deficiencies to be remedied by CONTRACTOR prior to final acceptance of the WORK by the ENGINEER.

REFERENCE SPECIFICATIONS - Building, Electrical and Plumbing Codes, manufacturer's specifications or recommendations, and any other codes, specifications, or reference materials specified in the CONTRACT DOCUMENTS.

RESIDENT ENGINEER or RESIDENT PROJECT REPRESENTATIVE - The authorized representative of ENGINEER who is assigned to the site or any part thereof, or the ENGINEER himself if no other person has been designated the authority of a resident engineer.

ROADBED - The roadbed is that area between the intersection of the upper surface of the roadway and the side slopes or curb lines. The roadbed rises in elevation as each increment or layer of subbase, base, surfacing or pavement is placed. Where the medians are so wide as to include areas of undisturbed land, a divided highway is considered as including two separate roadbeds.

ROADWAY - That portion of the highway included between the outside lines of sidewalks, or curbs, slopes, ditches, channels, waterways, and including all the appertaining structures, and other features necessary to proper drainage and protection.

SATISFACTORY MATERIALS - Materials which comply with the requirements of these SPECIFICATIONS and the PLANS.

SHOP DRAWINGS - All drawings, diagrams, illustrations, schedules, calculations, and other data which are specifically prepared by, or for CONTRACTOR, to illustrate some portion of the WORK and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the WORK. Shop Drawings shall be submitted by CONTRACTOR to the ENGINEER for ENGINEER's review and approval.

SHOULDERS - The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

STANDARD CONSTRUCTION SPECIFICATIONS - A part of the CONTRACT DOCUMENTS included in these STANDARD SPECIFICATIONS, consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the WORK encountered in the Yolo County Community Services projects, and certain administrative details applicable thereto.

STANDARD SPECIFICATIONS or YOLO STANDARD SPECIFICATIONS - These specifications containing: GENERAL and SPECIAL PROVISIONS, STANDARD CONSTRUCTION SPECIFICATIONS, and STANDARD DRAWINGS. The BOARD OF SUPERVISORS has adopted these SPECIFICATIONS as the STANDARD SPECIFICATIONS for its Department of Community Services contracts. When the standard specifications of other organizations or agencies, or parts of such specifications, are referred to in these SPECIFICATIONS, such standard specifications of other organizations or agencies, or parts of such specifications, are included in, and a part of, these SPECIFICATIONS.

STATE SPECIFICATIONS - The Standard Specifications of the State of California, Department of Transportation, also known as CALTRANS Standard Specifications, as currently approved and in effect. In referring to the STATE SPECIFICATIONS, the section numbers referred to are those contained in this current edition. If, in subsequent editions, the section numbers are changed, the reference shall be construed to refer to the class of material or items in the latest edition which was designated by that number in said current edition.

STATE - Whenever the word "State" is used in the STATE SPECIFICATIONS, it shall mean the COUNTY.

SUBBASE - A layer of specified material of planned thickness between a base and the basement material.

SUBCONTRACTOR - An individual, firm, or corporation, having a direct contract with CONTRACTOR or with any other SUBCONTRACTOR, who will perform work or labor or render service to the CONTRACTOR in or about the construction of the WORK.

SUBGRADE - That portion of the roadbed on which pavement, surfacing, base, subbase, or a layer of any other material is placed.

SUPPLIER - A manufacturer, fabricator, supplier, distributor, materialman, or vendor.

TECHNICAL SPECIFICATIONS - A part of CONTRACT DOCUMENTS describing the WORK and setting forth specific conditions or requirements peculiar to the WORK, and supplementary to the STANDARD SPECIFICATIONS.

TRAFFIC LANE - That portion of a traveled way for the movement of a single line of vehicles.

TRAVELLED WAY - That portion of the roadway for the movement of vehicles, exclusive of shoulders.

UNDERGROUND FACILITIES - All pipelines, conduits, duets, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasement containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

UNSATISFACTORY MATERIALS - Materials which do not comply with the requirements of these CONTRACT DOCUMENTS.

UTILITY - Tracks, overhead or underground wires, pipelines, conduits, ducts, or structures, sewers or storm drains owned, operated, or maintained in or across a public right-of-way or private easement, whether existing or proposed.

WASTE – Any objects encountered during excavation or clear and grub operations that are not dirt , vegetation, or litter.

WORK - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the CONTRACT DOCUMENTS. WORK is the result of performing services, furnishing labor, and furnishing and incorporating materials and equipment into the construction, all as required by the CONTRACT DOCUMENTS.

WORKING DAY - A working day is defined as any day, except as follows:

(A) Saturdays, Sundays, and Legal Holidays.

(B) Days on which CONTRACTOR is prevented by inclement weather or conditions resulting immediately therefrom, adverse to the current controlling operation or operations as determined by the ENGINEER, from proceeding with at least 75 percent of the normal labor and equipment force engaged on such operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations.

The CONTRACT TIME shall be considered as of the essence to the CONTRACT.

WORK DIRECTIVE CHANGE - A written directive to CONTRACTOR, issued on or after the EFFECTIVE DATE OF THE AGREEMENT and signed by the DIRECTOR ordering an addition, deletion or revision in the WORK, or responding to differing or unforeseen physical conditions under which the WORK is to be performed, or to emergencies. A WORK DIRECTIVE CHANGE may not change the CONTRACT PRICE or the CONTRACT TIME, but may lead to a subsequently issued CONTRACT CHANGE ORDER following negotiations by the parties as to its effect, if any, on the CONTRACT PRICE or CONTRACT TIME.

SECTION 2 - PROPOSAL REQUIREMENTS AND CONDITIONS

2-1 APPROXIMATE ESTIMATE

The quantities given in the Notice to Contractors, PROPOSAL, and CONTRACT are approximate only, being given as a basis for the comparison of BIDS. The COUNTY does not, expressly or by implication, agree that the actual amount of WORK will correspond therewith. The COUNTY also reserves the right to increase or decrease the amount of any class or portion of the WORK, or to delete any portion of the WORK, as may be deemed necessary or advisable by the ENGINEER.

2-2 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK

The BIDDER shall examine carefully the site of the WORK contemplated, as well as the PROPOSAL, PLANS, SPECIFICATIONS, and CONTRACT DOCUMENTS therefor.

The submission of a BID shall be conclusive evidence that the BIDDER has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of WORK to be performed, the quantities of materials to be furnished, and as to the requirements of the PROPOSAL, PLANS, SPECIFICATIONS, and CONTRACT.

Where the DEPARTMENT has made investigations of site conditions including subsurface conditions in areas where WORK is to be performed under the CONTRACT, or in other areas, some of which may constitute possible local material sources, such investigations are made only for the purpose of study and design. Where such investigations have been made, BIDDERS or CONTRACTORS may, upon written request, inspect the records of the DEPARTMENT as to such investigations subject to and upon the conditions hereinafter set forth. Such inspection of records may be made at the office of the DEPARTMENT.

The records of such investigations are not a part of the CONTRACT and are shown solely for the convenience of the BIDDER or CONTRACTOR. It is expressly understood and agreed that the COUNTY assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the investigations thus made, the records thereof, or of the interpretations set forth therein or made by the DEPARTMENT in its use thereof, and there is no warranty or guaranty either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such areas, or any part thereof, or that unlooked-for developments may not occur, or that materials other than, or in proportions different from those indicated, may not be encountered.

When a log of test borings or other record of geotechnical data obtained by the DEPARTMENT'S investigation of subsurface conditions is included with the PLANS, it is expressly understood and

agreed that said record does not constitute a part of the CONTRACT, represents only the opinion of the DEPARTMENT as to the character of the materials or the conditions encountered by it in its investigations, is included in the PLANS only for the convenience of BIDDERS and its use is subject to all of the conditions and limitations set forth in this Section 2-2.

When contour maps are used in the design of the project, the BIDDERS may inspect such maps, and if available, they may obtain copies for their use.

The availability or use of information described in this Section 2-2 is not to be construed in any way as a waiver of the provisions of the first paragraph in this Section 2-2, and a BIDDER or CONTRACTOR is cautioned to make such independent investigation and examination as he deems necessary to satisfy himself as to conditions to be encountered in the performance of the WORK and with respect to possible local material sources, the quality and quantity of material available from such property, and the type and extent of processing that may be required in order to produce material conforming to the requirements of the SPECIFICATIONS.

No information derived from such inspection of records of investigations or compilation thereof made by the DEPARTMENT, or from the ENGINEER, or his assistants, will in any way relieve the BIDDER or CONTRACTOR from any risk or from properly fulfilling the terms of the CONTRACT.

2-3 BIDDER'S PROPOSAL

All PROPOSALS shall be made upon blank forms obtained from the DEPARTMENT as set forth in the Notice to Contractors. The BIDDER shall submit a PROPOSAL on these forms. PROPOSALS submitted on forms other than the one issued to the BIDDER will be disregarded. The PROPOSAL shall set forth for each item of WORK, in clear legible figures, the item price and total for each item. The BIDDER shall fill out all blanks in the PROPOSAL FORM as therein required.

The PROPOSAL FORM, BONDS, and AGREEMENT are bound separately from the Notice to Contractors, GENERAL PROVISIONS, SPECIAL PROVISIONS, TECHNICAL PROVISIONS, and PLANS. No part of the PROPOSAL FORM, BONDS, and AGREEMENT booklet shall be detached therefrom. The page numbers of each bound document are numbered sequentially, and by submitting its PROPOSAL, the BIDDER certifies that he or she has received and reviewed all pages.

The PROPOSAL must be signed with the full name of the BIDDER; if a partnership, by a member of the firm; if a limited partnership, by a general partner; if a corporation, by the appropriate officer thereof in the corporate name with the seal attached. When PROPOSALS are signed by an agent other than the officer or officers of a corporation authorized to sign contracts on its behalf, or a member of a partnership, a "Power of Attorney" must be on file with the COUNTY prior to opening bids, or shall be submitted with the PROPOSAL. All PROPOSALS otherwise submitted may be rejected as irregular and unauthorized.

The PROPOSAL shall consist of:

1. BIDDER'S Statement of Financial Responsibility, Technical Ability and Experience.
2. BIDDER'S Debarment and Suspension
3. BIDDER'S List of Subcontractors
4. BIDDER'S Noncollusion Declaration
5. BIDDER'S Iran Contracting Act Certification
6. BIDDER'S Public Works Contractor Registration Certification
7. BIDDER'S Proposal Guarantee
8. PROPOSAL.

Failure to furnish any of the above may result in rejection of the PROPOSAL.

All PROPOSALS shall be submitted as directed in the Notice to Contractors under sealed cover conspicuously marked as a PROPOSAL, and identifying the project to which the PROPOSAL relates and the date of the bid opening therefor. PROPOSALS which are not properly marked or sealed may be disregarded.

2-4 REJECTION OF PROPOSALS

The COUNTY reserves the right to reject any or all PROPOSALS. PROPOSALS may be rejected if they show any alteration of form, additions not called for, conditional bids, incomplete bids, erasures or irregularities of any kind.

2-5 PROPOSAL GUARANTY

All PROPOSALS shall be accompanied by cash, cashier's check, certified check or bidder's bond, made payable to the County of Yolo. The amount of said requirement shall be not less than ten (10%) percent of the amount of the attached BID. The bidder's bond shall be executed by a corporation, as surety, authorized to issue surety bonds in the State of California. This requirement is a guaranty that, if awarded the CONTRACT, the BIDDER will sign the CONTRACT to do the WORK. In the event of the BIDDER'S failure to sign the CONTRACT, after such award for the WORK, the cash, check or bidder's bond shall be forfeited to the COUNTY.

2-6 WITHDRAWAL OF PROPOSALS

Any PROPOSAL may be withdrawn at any time prior to the hour fixed in the Notice to Contractors for the opening of PROPOSALS. A written request for the withdrawal of the PROPOSAL shall be filed with the County Clerk, and shall be executed by the BIDDER or his duly

authorized representative. The withdrawal of a PROPOSAL shall not prejudice the right of a BIDDER to file a new PROPOSAL.

Whether or not the PROPOSALS are opened exactly at the time fixed in the Notice to Contractors, a PROPOSAL will not be received after that time, nor may any PROPOSAL be withdrawn after the PROPOSAL opening time.

2-7 PUBLIC OPENING OF PROPOSALS

PROPOSALS will be opened and read publicly at the time and place indicated in the Notice to Contractors. BIDDERS are invited to be present.

2-8 BIDDER'S STATEMENT OF FINANCIAL RESPONSIBILITY, TECHNICAL ABILITY, AND EXPERIENCE

A record of the BIDDER'S experience in construction of a type similar to that contemplated under this CONTRACT shall be set forth in the PROPOSAL. It is the intent of the COUNTY to award the CONTRACT to the BIDDER who furnishes satisfactory evidence of having the requisite experience and ability to enable him to prosecute the WORK successfully and properly, as well as to complete it within the time named in the CONTRACT.

To determine the degree of responsibility to be credited to the BIDDER the COUNTY will weigh evidence that the BIDDER has satisfactorily performed other contracts of like nature, magnitude, and comparable difficulty and rates of progress.

Additional Satisfactory Evidence shall be defined in Section 11-4, “Submissions of Bids and Award of Contract”.

For bids in excess of Seven Hundred Fifty Thousand Dollars ($750,000), the CONTRACTOR must provide proof to show compliance with Section 8-1.5.

2-9 BIDDER'S STATEMENT OF SUBCONTRACTORS

Each BIDDER making a PROPOSAL to perform WORK described in these SPECIFICATIONS shall comply with the requirements of the Subletting and Subcontracting Fair Practices Act (Public Contract Code section 4100 et seq.), which forbids bid shopping and bid peddling and requires accurate listing of certain SUBCONTRACTORS.

The PROPOSAL shall set forth the name and location of the place of business, California contractor license number, and Department of Industrial Relations registration number of each SUBCONTRACTOR who will perform work or labor, or render service to the CONTRACTOR, in or about the construction of the work or improvement, or a SUBCONTRACTOR licensed by the State of California who, under subcontract to the CONTRACTOR, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the PLANS

and SPECIFICATIONS, and the portion of the WORK which will be done by each SUBCONTRACTOR. This listing is required for SUBCONTRACTORS who will perform work or labor, or render service of a value of more than one-half (1/2%) percent of the BIDDER's total bid amount, or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 (1%) percent of the BIDDER's total bid or ten thousand dollars ($10,000), whichever is greater.

Should CONTRACTOR violate any of the provisions of the Subletting and Subcontracting Fair Practices Act, such violation shall be deemed a breach of the CONTRACT. The COUNTY shall have all remedies provided by California law, including but not limited to those provided in Public Contract Code section 4110, allowing termination of the CONTRACT or a penalty assessment of ten (10%) percent of the subcontract.

2-10 ADDENDA

The COUNTY may, when it deems necessary, issue ADDENDA to the PLANS and SPECIFICATIONS to amend, clarify, or correct matter contained therein. Such ADDENDA shall constitute a part of said PLANS and SPECIFICATIONS and shall be equally binding with them. ADDENDA shall be forwarded to all prospective BIDDERS.

2-11 PROTESTS

The COUNTY encourages CONTRACTORS to resolve issues regarding requirements or the procurement process through written correspondence and discussions. The COUNTY is committed to fostering relationships with its CONTRACTORS to encourage an ongoing pursuit to fulfill requirements.

2-11.1 PROTEST PROCEDURES:

All protests shall be written under the BIDDER's letterhead and submitted in accordance with the provisions stated herein. Protests may be submitted by mail or email. Protests submitted by facsimile will not be accepted. All protests must be addressed and submitted to the Manager of Procurement. All protests shall include at minimum the following information:

a) The name, address, and telephone number of the BIDDER;
b) The signature of the BIDDER or BIDDER's representative;
c) The solicitation title and PROPOSAL due date;
d) Name of COUNTY employee designated as the RFP/IFB Coordinator;
e) Identification of the COUNTY determination or recommendation being protested or statute or procedure that is alleged to have been violated;
f) A detailed statement identifying the legal and/or factual grounds of the protest and all documentation supporting the BIDDER's position;
g) The form of relief requested.

The contact information for the Manager of Procurement is as follows:

Manager of Procurement
Yolo County Department of Financial Services
625 Court St., Ste. 103
Woodland, CA 95695-3490

BIDDER's failure to comply with these procedures and time limits in this Section shall constitute a failure to exhaust administrative remedies and a waiver of any right to further protest, including filing a Government Code Claim or legal proceedings.

The Manager of Procurement will review the materials in connection with the protest, assess the merits of the protest, and provide a written decision on the protest. The Manager of Procurement's decision is final.

2-11.2 PROTEST OF CONTRACT DOCUMENTS:

BIDDERS who are concerned regarding irregularities or lack of clarity in the CONTRACT DOCUMENTS should bring such concerns to the attention of the COUNTY. Notice shall be provided prior to the closing date and time of the designated question and answer period in the Notice to Contractors.

Notice must be clearly marked "**Notice of Protest of Contract Documents**". No protest shall be considered after the deadline stated above.

BIDDERS who fail to do so forfeit all rights to protest a solicitation or any subsequent award based on the CONTRACT DOCUMENTS of this solicitation. In the event the protest is denied and the BIDDER wishes to continue in the solicitation process, they must still submit a PROPOSAL prior to the close of the solicitation

2-11.3 PROTEST OF BID:

Protests related to another BIDDER must be received by e-mail or hard copy no later than 4:00 PM Pacific time five (5) business days after the proposal opening date. Notice must be clearly marked "**Notice of Proposal Protest**". A review may be granted if the protest is received within the specified time and the protest is from a BIDDER.

Throughout the review process, the COUNTY has no obligation to delay or otherwise postpone an award of a contract based on a protest.

SECTION 3 - AWARD AND EXECUTION OF CONTRACT

3-1 AWARD OF CONTRACT

The COUNTY reserves the right to reject any and all PROPOSALS.

The award of the CONTRACT, if it be awarded, will be to the lowest responsible BIDDER whose PROPOSAL complies with all the requirements prescribed. Such award, if made, will be made within sixty (60) days after the opening of PROPOSALS. If the lowest responsible BIDDER refuses or fails to execute the CONTRACT, the BOARD OF SUPERVISORS may award the CONTRACT to the second lowest responsible BIDDER. Such award, if made, will be made within ninety (90) days after the opening of the PROPOSALS. If the second lowest responsible BIDDER refuses or fails to execute the CONTRACT, the BOARD OF SUPERVISORS may award the CONTRACT to the third lowest responsible BIDDER. Such award, if made, will be made within one-hundred twenty (120) days after the opening of the PROPOSALS. The periods of time specified above within which award of CONTRACT may be made shall be subject to extension for such further period as may be agreed upon in writing between the COUNTY and the BIDDER concerned.

All PROPOSALS will be compared on the basis of the ENGINEER's ESTIMATE of the quantities of WORK to be done.

3-2 EXECUTION OF CONTRACT

The CONTRACT shall be signed in duplicate by the successful BIDDER and returned, together with the required insurance certificates, within ten (10) days, not including Sundays and legal holidays, after the BIDDER has received notice that the CONTRACT has been awarded.

3-3 CONTRACT BONDS

Within (10) ten days of the award of the CONTRACT by the BOARD OF SUPERVISORS, CONTRACTOR shall file with the COUNTY a performance bond and a payment bond. The BONDS shall be executed by a surety, authorized to do business in the State of California, and shall be acceptable to the COUNTY. The performance bond shall be equal to one-hundred (100%) percent of the CONTRACT price. The payment bond shall be equal to one-hundred (100%) percent of the CONTRACT price. All BONDS shall be in United States dollars. All BONDS shall be furnished on forms provided by the COUNTY as included in the CONTRACT and bid documents.

No change or alteration of the WORK or modification of the CONTRACT DOCUMENTS between the COUNTY and CONTRACTOR shall release or exonerate any surety or sureties upon said BONDS. For the purpose of protecting the COUNTY against any failure of CONTRACTOR to

perform the CONTRACT and make full payment thereunder for all WORK done and materials furnished, the principal and sureties on said BONDS, in consideration of the approval thereof by the COUNTY, shall expressly recite and covenant therein that if, in the opinion of the COUNTY, any change of the conditions surrounding said WORK, any increase in the total amount of cost thereof, or any diminution of the security furnished by said BONDS renders the same insufficient, such additional security as may be required by the COUNTY shall be furnished by the principal on said BONDS within ten (10) days after notice of such requirement, and that default in the furnishing of such additional security shall be deemed a breach of the CONTRACT on the part of CONTRACTOR, and that no change in the CONTRACT DOCUMENTS and no agreement for reduced, added, or extra WORK in accordance with the provisions therefore, whether with or without notice to, or consent by, the sureties, shall relieve any of the parties to said BONDS.

3-4 FAILURE TO EXECUTE CONTRACT

Failure of the lowest responsible BIDDER, the second lowest responsible BIDDER, or the third lowest responsible BIDDER to execute the CONTRACT, provide acceptable BONDS, and file insurance as provided herein within ten (10) days, not including Sundays and legal holidays, after such BIDDER has received notice that the CONTRACT has been awarded to them shall be just cause for the forfeiture of the PROPOSAL GUARANTY. The successful BIDDER may file with the DIRECTOR a written notice, signed by the BIDDER or their authorized representative, specifying that the BIDDER will refuse to execute the CONTRACT if presented to them. The filing of such notice shall have the same force and effect as the failure of the BIDDER to execute the CONTRACT and furnish acceptable BONDS and insurance certification within the time herein before prescribed.

3-5 RETURN OF PROPOSAL GUARANTIES

Within ten (10) days after the award of the CONTRACT to the lowest responsible BIDDER, the COUNTY will return the PROPOSAL GUARANTY to each BIDDER that is not to be further considered in making the award, but will continue to retain the PROPOSAL GUARANTY submitted by the first, second, and third lowest BIDDERS. Each PROPOSAL GUARANTY will be held until the CONTRACT has been executed, after which each PROPOSAL GUARANTY, except any PROPOSAL GUARANTY which has been forfeited, will be returned to the respective BIDDERS whose PROPOSALS they accompany.

3-6 CONTRACTOR'S GUARANTY

Unless otherwise specified in the CONTRACT DOCUMENTS, CONTRACTOR shall unconditionally guaranty all materials, workmanship and equipment against defect for a period of one (1) calendar year, commencing on the date of recordation of the Notice of Completion.

During this unconditional guaranty period, the CONTRACTOR shall, upon the receipt of notice in writing from the COUNTY, promptly make all repairs caused by defective materials, workmanship or equipment.

By executing the CONTRACT, CONTRACTOR agrees that the COUNTY is authorized to provide for such repairs if, ten (10) days after receipt of written notice from the COUNTY, the CONTRACTOR has failed to make or undertake, with due diligence, the repairs. In the case of an emergency where, in the opinion of the ENGINEER, delay could cause serious loss or damage, repairs may be made by the COUNTY without notice being sent to CONTRACTOR, and all expense associated therewith shall be charged to CONTRACTOR.

The contract bonds furnished in accordance with Section 3-3, "Contract Bonds," of these SPECIFICATIONS must remain in full force and effect during the guarantee period and the obligations of the surety shall continue as long as any obligation of CONTRACTOR remains.

In the case of conflict between this guarantee provision and any warranty provision included in the CONTRACT, the most advantageous provisions to the COUNTY will apply.

Nothing in this Section shall be construed to be a waiver of any additional rights or remedies available to the COUNTY through local, State, and Federal ordinances and codes.

3-7 PRE-CONSTRUCTION CONFERENCE

Prior to start of construction, a conference will be called for the purpose of reviewing the construction program with CONTRACTOR. At this conference the sequence of WORK, methods of access to the construction site, and temporary facilities shall be agreed upon by CONTRACTOR and ENGINEER. Coordination of utilities within the project limits, including relocations and maintenance of existing facilities and additions thereto, shall be confirmed in writing by utility representatives and CONTRACTOR at this conference or within five (5) WORKING DAYS thereafter.

SECTION 4 - SCOPE OF WORK AND CHANGES

4-1 INTENT OF PLANS AND SPECIFICATIONS

The intent of the PLANS and SPECIFICATIONS is to prescribe the details for the construction and completion of the WORK, which the CONTRACTOR agrees to perform in accordance with the terms of the CONTRACT. Where the PLANS and SPECIFICATIONS describe portions of the WORK in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, CONTRACTOR shall furnish all labor, materials, tools, equipment, and incidentals, and do all the Work involved in executing the CONTRACT in a satisfactory and expert manner. The WORK performed under the CONTRACT shall result in a complete operating system in satisfactory working condition with respect to the functional purposes of the installation, and no extra compensation will be allowed for anything omitted but fairly implied.

4-2 CONFORMANCE WITH CODES AND STANDARDS

All WORK and materials shall be in full accordance with the latest adopted standards and regulations of the State Fire Marshal; the California Building Code; Title 24 of the California Administrative Code; the California Electrical Code; the California Plumbing Code; and other applicable codes, laws, or regulations. Nothing in these PLANS or SPECIFICATIONS is to be construed to permit WORK not conforming to these requirements. When the WORK detailed in the PLANS and SPECIFICATIONS differs from governing codes, CONTRACTOR shall furnish and install the higher standard called for.

4-3 CHANGES AND EXTRA WORK

The COUNTY reserves the right to make alterations, deviations, additions to, or deletions from the PLANS and SPECIFICATIONS. This includes the right to increase or decrease the quantity of any item or portion of the WORK or to delete any item or portion of the WORK, as determined by the ENGINEER to be necessary or advisable. The ENGINEER may also require EXTRA WORK as deemed necessary for the proper completion or construction of the whole WORK contemplated.

Any such changes will be set forth in a CONTRACT CHANGE ORDER. It will specify, in addition to the WORK to be done in connection with the change made, adjustment of CONTRACT TIME, if any, and the basis of compensation for such work. A CONTRACT CHANGE ORDER will not become effective until approved by the DIRECTOR or BOARD OF SUPERVISORS, as applicable. Whenever any change is made as provided for herein, such change shall be considered and

treated as though originally included in the CONTRACT, and shall be subject to all terms, conditions, and provisions of the original CONTRACT.

Upon receipt of an approved CONTRACT CHANGE ORDER, CONTRACTOR shall proceed with the ordered WORK. If ordered in writing by the ENGINEER, CONTRACTOR shall proceed with the WORK, so ordered, prior to actual receipt of an approved CONTRACT CHANGE ORDER therefor.

Any alterations, extensions of time, EXTRA WORK, or any other changes may be made without securing consent of the CONTRACTOR's surety or sureties.

When the compensation for an item of WORK is subject to adjustment under the provisions of this Section, the CONTRACTOR shall, upon request, furnish the ENGINEER with adequate detailed cost data for such item of WORK. If the CONTRACTOR requests an adjustment in compensation for an item of WORK as provided in Sections 4-3.3.1 or 4-3.3.2, such cost data shall be submitted with his request.

4-3.1 PROCEDURE AND PROTEST

The COUNTY may direct changes in the WORK be delivering a WORK DIRECTIVE CHANGE. To the extent the WORK DIRECTIVE CHANGE results in a change to compensation or time, CONTRACTOR must timely request a CONTRACT CHANGE ORDER and comply with all change order procedures in accordance with this Section. Notwithstanding issuance of a WORK DIRECTIVE CHANGE, CONTRACTOR's failure to timely request a CONTRACT CHANGE ORDER shall constitute a waiver by CONTRACTOR of any adjustment to compensation or time extension for WORK performed under the directive. The COUNTY shall not be liable to CONTRACTOR for WORK performed or omitted by CONTRACTOR in reliance on verbal orders.

If CONTRACTOR intends to initiate a CONTRACT CHANGE ORDER, then CONTRACTOR shall provide the COUNTY with written notice of the underlying facts and circumstances that give rise to the proposed change. CONTRACTOR shall submit the notice of change/delay prior to performance of the work and no later than five (5) days after CONTRACTOR discovers the circumstances causing the need for the CONTRACT CHANGE ORDER. To be considered valid and complete, the notice of change/delay shall include a general statement of the circumstances giving rise to the notice of change/delay and a reasonable order of magnitude estimate of the additional costs and/or time. If the circumstances give rise to both a cost adjustment and time extension, CONTRACTOR shall submit the notice of change and notice of delay concurrently.

CONTRACTOR shall submit a formal written request for a CONTRACT CHANGE ORDER for any adjustment to CONTRACTOR's compensation and/or any extension of time. The CONTRACT CHANGE ORDER request shall be made prior to incurring any expense and within fourteen (14) days from either CONTRACTOR'S notice of change/delay or the COUNTY's WORK DIRECTIVE CHANGE ordering the change.

a. The change order request shall include all of the following information (unless inapplicable to the change):

i. A detailed description of the circumstances giving rise to the request;

ii. A complete itemized cost proposal;

iii. Supporting documentation for all costs;

iv. A time impact analysis showing the impact of the delay to the critical path to completion;

v. If any added costs or information cannot be determined at the time of the change order request, the reason the costs or information cannot be determined at the time; and

vi. Certification to the accuracy of the change order request under penalty of perjury.

If the COUNTY denies the change order request or disagrees with the proposal submitted by CONTRACTOR, the COUNTY will notify the CONTRACTOR, and the COUNTY will provide its opinion of the appropriate price and/or time extension. If no agreement can be reached, the COUNTY shall have the right to order the work performed on a time-and-material basis by CONTRACT CHANGE ORDER or to issue a unilateral CONTRACT CHANGE ORDER setting forth the COUNTY'S determination of the reasonable additions or savings in costs and time attributable to the extra or deleted work. The COUNTY's determination shall become final and binding if the CONTRACTOR fails to submit a claim in writing to the COUNTY within fourteen (14) days of the issuance of the unilateral CONTRACT CHANGE ORDER, disputing the terms of the unilateral CONTRACT CHANGE ORDER and providing such supporting documentation for its position as the COUNTY may reasonably require.

CONTRACTOR'S FAILURE TO PROVIDE A COMPLETE AND TIMELY NOTICE OF CHANGE/DELAY AND/OR CHANGE ORDER REQUEST, OR TO COMPLY WITH ANY OTHER REQUIREMENT OF THIS SECTION, SHALL CONSTITUTE A WAIVER BY CONTRACTOR OF THE RIGHT TO A CONTRACT ADJUSTMENT ON ACCOUNT OF SUCH CIRCUMSTANCES AND A WAIVER OF ANY RIGHT TO FURTHER RECOURSE OR RECOVERY BY REASON OF OR RELATED TO SUCH CHANGE BY MEANS OF THE CLAIMS DISPUTE RESOLUTION PROCESS OR BY ANY OTHER LEGAL PROCESS OTHERWISE PROVIDED FOR UNDER APPLICABLE LAWS.

CONTRACTOR recognizes and acknowledges that timely submission of a formal written notice of change/delay and change order request, whether or not the circumstances of the change may be known to the COUNTY or available to the COUNTY through other means, is not a mere formality but is of crucial importance to the ability of the COUNTY to promptly identify, prioritize, evaluate and mitigate the potential effects of changes. Any form of informal notice, whether verbal or written (including, without limitation, statements in requests for information, statements at regular job meetings or entries on monthly reports, daily logs or job

meeting minutes), that does not strictly comply with the formal requirements of this Section, shall accordingly be insufficient.

A CONTRACT CHANGE ORDER signed by the CONTRACTOR indicates the CONTRACTOR's agreement therewith, including any adjustment in compensation or extension of time, and the full and final settlement of all costs (direct, indirect and overhead) related to the work authorized by the CONTRACT CHANGE ORDER.

The COUNTY may designate the forms to be used for notices, requests, and CONTRACT CHANGE ORDER. If so designated, CONTRACTOR may only use such forms. CONTRACTOR shall not reserve a right to assert impact costs, extended job site costs, extended overhead, constructive acceleration and/or actual acceleration beyond what is stated in the CONTRACT CHANGE ORDER. No claims shall be allowed for impact, extended overhead costs, constructive acceleration and/or actual acceleration due to a multiplicity of changes and/or clarifications. The CONTRACTOR may not change or modify the COUNTY'S CONTRACT CHANGE ORDER form in an attempt to reserve additional rights.

4-3.2 DETERMINING ADJUSTMENTS TO COMPENSATION

CONTRACTOR shall not be entitled to any compensation for work subject to a CONTRACT CHANGE ORDER except as expressly set forth in this Section. The mark-up added in instances of EXTRA WORK shall constitute the entire amount of profit, any mark-ups, any field or home office overhead costs, including personnel, equipment or office space, any materials, or any costs of equipment idle time for such EXTRA WORK.

Adjustments, if any, in the amount to be paid CONTRACTOR by reason of any modifications of the WORK as set forth in the CONTRACT CHANGE ORDER, shall be determined by one or more of the following methods as elected by the ENGINEER:

A. Lump Sum Price - By an acceptable lump sum proposal from CONTRACTOR.

B. Unit Prices - By unit prices fixed by agreement between the COUNTY and CONTRACTOR.

C. Force Account - By ordering CONTRACTOR to proceed with the EXTRA WORK and to keep and present in such form as the ENGINEER may direct, a correct account of the cost of the change, together with all vouchers therefor.

Estimates for Lump Sum Price and Unit Prices, and accounting for Force Account shall be limited to direct expenditures necessitated specifically by the change and shall be segregated as set forth in Section 4-4 Force Account Payment.

4-3.3 INCREASED OR DECREASED QUANTITIES

If the total pay quantity of any item of WORK required under the CONTRACT varies from the ENGINEER's ESTIMATE by 25 percent or less, payment will be made at the CONTRACT unit price.

This calculation may result in either an additive or deductive CONTRACT CHANGE ORDER. Because CONTRACT unit price includes overhead and profit as determined by CONTRACTOR at the time of its proposal submission, no mark up or deduction for overhead and profit will be allowed.

If the total pay quantity of any item of WORK required under the CONTRACT varies from the ENGINEER's ESTIMATE by more than 25 percent, in the absence of an executed CONTRACT CHANGE ORDER specifying the compensation to be paid, the compensation payable to the CONTRACTOR will be determined in accordance with Sections 4-3.3.1, 4-3.3.2, or 4-3.3.3, as applicable.

4-3.3.1 INCREASES OF MORE THAN 25 PERCENT

Should the total pay quantity of any item of WORK required under the CONTRACT exceed the ENGINEER's ESTIMATE by more than 25 percent, the WORK in excess of 125 percent of such estimate and not covered by an executed CONTRACT CHANGE ORDER specifying the compensation to be paid therefor, will be paid for by adjusting the CONTRACT unit price, as hereinafter provided, or at the option of the ENGINEER, payment for the WORK involved in such excess will be made on the basis of force account as provided in Section 4-4.

Such adjustment of the CONTRACT unit price will be the difference between the CONTRACT unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item. If the costs applicable to such item of WORK include fixed costs, such fixed costs will be deemed to have been recovered by CONTRACTOR by the payments made for 125 percent of the ENGINEER's ESTIMATE of the quantity of such item, and in computing the actual unit cost, such fixed costs will be excluded. Subject to the above provisions, such actual unit cost will be determined by the ENGINEER in the same manner as if the WORK were to be paid for on a force account basis as provided in Section 4-4, or such adjustment will be as agreed to by CONTRACTOR and the ENGINEER.

When the compensation payable for the number of units of an item of WORK performed in excess of 125 percent of the ENGINEER's ESTIMATE is less than $5,000 at the applicable CONTRACT unit price, the ENGINEER reserves the right to make no adjustment in said price, except that an adjustment will be made if requested in writing by CONTRACTOR.

4-3.3.2 DECREASES OF MORE THAN 25 PERCENT

Should the total pay quantity of any item of WORK required under the CONTRACT be less than 75 percent of the ENGINEER's ESTIMATE, an adjustment in compensation pursuant to this Section will not be made unless CONTRACTOR so requests in writing. If CONTRACTOR so requests, the quantity of said item performed, unless covered by an executed CONTRACT CHANGE ORDER specifying the compensation payable therefor, will be paid for by adjusting the CONTRACT unit price as hereinafter provided. At the option of the ENGINEER, payment for the quantity of WORK of such item performed will be made on a force account basis as provided in

Section 4-4, provided however, that in no case shall the payment for such WORK be less than that which would be made at the CONTRACT unit price.

Such adjustment of the CONTRACT unit price will be the difference between the CONTRACT unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item, including fixed costs. Such actual unit cost will be determined by the ENGINEER in the same manner as if the WORK were to be paid for on a force account basis as provided in Section 4-4; or such adjustment will be as agreed to by CONTRACTOR and the ENGINEER.

The payment for the actual pay quantity of any such item of WORK will in no case exceed the payment which would be made for the performance of 75 percent of the ENGINEER's ESTIMATE of the quantity for such item at the original CONTRACT unit price.

4-3.3.3 ELIMINATED ITEMS

Should any CONTRACT item of the WORK be eliminated in its entirety, in the absence of an executed CONTRACT CHANGE ORDER covering such elimination, payment will be made to CONTRACTOR for actual costs incurred in connection with such eliminated CONTRACT item, if incurred prior to the date of notification in writing by the ENGINEER of such elimination.

If materials conforming to the PLANS and SPECIFICATIONS are ordered by CONTRACTOR for the eliminated item prior to the date of notification of such elimination by the ENGINEER, and if orders for such material cannot be cancelled, it will be paid for at the actual cost to the CONTRACTOR. In such case, the material paid for shall become the property of the COUNTY and the actual cost of any further handling will be paid for. If the material is returnable to the vendor and if the ENGINEER so directs, the material shall be returned and CONTRACTOR will be paid for the actual cost of charges made by the vendor for returning the material. Payment will be made for the actual cost of handling returned material.

Payment for the actual costs or charges as provided in this Section 4-3.3.3 will be computed in the same manner as if the WORK were to be paid for on a force account basis as provided in Section 4-4.

4-3.4 EFFECT OF EXTENSION OF TIME

The granting of an extension of CONTRACT TIME for the completion of the WORK on account of delays which in the judgment of the ENGINEER are unavoidable delays or granted in a CONTRACT CHANGE ORDER, shall in no way operate as a waiver on the part of the COUNTY of any of its rights under this CONTRACT.

4-4 FORCE ACCOUNT PAYMENT

When a CONTRACT CHANGE ORDER is to be paid for on a force account basis, the labor, materials, and equipment used in the performance of such WORK shall be subject to the approval of the ENGINEER, and compensation being determined as follows:

4-4.1 WORK PERFORMED BY CONTRACTOR

CONTRACTOR will be paid the direct costs for labor, materials and equipment used in performing the work determined as hereinafter provided in this Section.

To the total of the direct costs computed for labor, materials and equipment, there will be added a markup of fifteen percent (15%) to the cost of labor, fifteen percent (15%) to the cost of materials, and fifteen percent (15%) to the equipment rental.

The above markups shall constitute full compensation for all overhead costs and profits, which shall be deemed to include all items of expense not specifically designated as cost or equipment rental in Sections 4-4.1.1, "Labor," 4-4.1.2, "Materials," and 4-4.1.3, "Equipment Rental." The total payment made as provided above shall be deemed to be the actual cost of such work to be borne by the COUNTY and shall constitute full compensation therefor.

When EXTRA WORK to be paid for on a force account basis is performed by a subcontractor by a CONTRACT CHANGE ORDER, an additional markup of five percent (5%) may be added to the total cost of that EXTRA WORK including all markups specified in this Section 4-4.1. The additional five percent (5%) markup shall reimburse the CONTRACTOR for additional administrative costs, and no other additional payment will be made by reason of performance of the EXTRA WORK by a Subcontractor.

4-4.1.1 LABOR

CONTRACTOR will be paid the cost of labor for the workers including foremen when authorized by the ENGINEER, used in the actual and direct performance of the EXTRA WORK. The cost of labor, whether the employer is CONTRACTOR, SUBCONTRACTOR, or other forces, will be the sum of the following:

A. Actual Wages

The actual wages paid shall include any employer payments to or on behalf of the workers for health and welfare, pension, vacation, and similar purposes. These wages for employees not employed full time on the WORK, shall be apportioned on the basis of their time spent on the WORK.

B. Labor Surcharge

To the actual wages, as defined in Section 4-4.1.1A, will be added a labor surcharge set forth in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the EXTRA WORK is

accomplished. The labor surcharge shall constitute full compensation for all payments imposed by State and Federal laws and for all other payments made to, or on behalf of, the workers, other than actual.

4-4.1.2 MATERIALS

The COUNTY reserves the right to furnish such materials as it deems advisable, and CONTRACTOR shall have no claims for costs and markup on such materials.

Only materials furnished by CONTRACTOR and necessarily used in the performance of the WORK will be paid for. The cost of such materials will be the cost to the purchaser, whether CONTRACTOR, SUBCONTRACTOR, or other forces, from the Supplier thereof, except as the following are applicable:

A. If a cash or trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the COUNTY notwithstanding the fact that such discount may not have been taken.

B. If materials are procured by the purchaser by any method which is not a direct purchase from, and a direct billing, by the actual supplier to such purchaser, the cost of such materials shall be deemed to be the price paid to the actual supplier as determined by the ENGINEER, plus the actual costs, if any, incurred in the handling of such materials.

C. If the materials are obtained from the supply or source owned wholly or in part by the purchaser, the cost of such materials shall not exceed the price paid by the purchaser for similar materials furnished from said source on CONTRACT items, or the current wholesale price for such materials delivered to the job site, whichever price is lower.

D. If the cost of such materials is, in the opinion of the ENGINEER, excessive, then the cost of such material shall be deemed to be the lowest current wholesale price at which such materials are available in the quantities concerned, delivered to the job site, less any discounts as provided in the above subsection A.

E. If CONTRACTOR does not furnish satisfactory evidence of the cost of such materials from the actual supplier thereof, the cost shall then be determined in accordance with the above subsection D.

4-4.1.3 EQUIPMENT RENTAL

CONTRACTOR will be paid for the use of equipment at the rental rates listed for such equipment in the edition of the Department of Transportation publication, "Labor Surcharge and Equipment Rental Rates," which is in effect on the date upon which the EXTRA WORK is accomplished, regardless of ownership and any rental or other agreement, if such may exist, for the use of such equipment entered into by CONTRACTOR. If it is deemed necessary by the ENGINEER to use equipment not listed in said publication, a suitable rental rate for such

equipment will be established by the ENGINEER. CONTRACTOR may furnish any cost data which might assist the ENGINEER in the establishment of such rental rate.

The rental rate paid as above provided shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

Operators of rented equipment will be paid for as provided in Section 4-4.1.1, "Labor."

All equipment shall, in the opinion of the ENGINEER, be in good working condition and suitable for the purpose for which the equipment is to be used.

Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer. Individual pieces of equipment or tools not listed in said publication and having a replacement value of $150 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.

The rental time to be paid for equipment on the EXTRA WORK shall be the time the equipment is in operation on the EXTRA WORK being performed.

The following shall be used in computing the rental time of equipment on EXTRA WORK:

1. When hourly rates are listed, less than 30 minutes of operation shall be considered to be 1/2 hour of operation;

2. When daily rates are listed, less than four (4) hours of operation shall be considered to be 1/2 day of operation; and,

3. Rental time will not be allowed while equipment is inoperative due to breakdowns.

For the use of equipment moved in on the EXTRA WORK and used exclusively for EXTRA WORK paid for on a force account basis, CONTRACTOR will be paid for the cost of transporting the equipment to the location of the EXTRA WORK and its return to its original location, all in accordance with the following provisions:

1. The original location of the equipment to be hauled to the location of the EXTRA WORK shall be agreed to by the ENGINEER in advance;

2. The COUNTY will pay the costs of loading and unloading such equipment;

3. The cost of transporting equipment in low bed trailers shall not exceed the hourly rates charged by established haulers;

4. The cost of transporting equipment shall not exceed the applicable minimum established rates of the Public Utilities Commission;

5. Should the CONTRACTOR desire the return of the equipment to a location other than its original location, the COUNTY will pay the cost of transportation in accordance with the above provisions, provided such payment shall not exceed the cost of moving the equipment to the EXTRA WORK; and,

6. Payment for transporting and loading and unloading equipment, as above provided, will not be made if the equipment is used on the WORK in any other way than upon EXTRA WORK paid for on a force account basis.

4-4.2 RECORDS

CONTRACTOR shall maintain project records in such a manner as to provide a clear distinction between the direct costs of a CONTRACT CHANGE ORDER and the costs of other operations.

From the above records, CONTRACTOR shall furnish the ENGINEER completed daily CONTRACT CHANGE ORDER WORK reports, for each day to be paid for on a force account basis. The daily CONTRACT CHANGE ORDER reports shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the CONTRACTOR, SUBCONTRACTOR, or other forces. The daily CONTRACT CHANGE ORDER reports shall provide names or identifications and classifications of workers, the hourly rate of pay and hours worked, the size, type, and identification number of equipment, and hours operated.

Material changes shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily CONTRACT CHANGE ORDER reports, or if not available, they shall be submitted with subsequent daily CONTRACT CHANGE ORDER reports. Should said vendor's invoices not be submitted within sixty (60) DAYS after the date of delivery of the material or within fifteen (15) DAYS after completion of the CONTRACT, whichever occurs first, the COUNTY reserves the right to establish the cost of such materials at the lowest current wholesale prices at which said materials are available, in the quantities concerned, delivered to the location of WORK, less any discounts provided in Section 4-4.1.2.A.

Said daily CONTRACT CHANGE ORDER reports shall be signed by CONTRACTOR or an authorized representative.

The ENGINEER will compare the COUNTY's records with the completed daily CONTRACT CHANGE ORDER reports furnished by the CONTRACTOR and make any necessary adjustments. When these daily CONTRACT CHANGE ORDER reports are agreed upon and signed by both parties said reports shall become the basis of payment for the EXTRA WORK performed, but shall not preclude subsequent adjustment based on a later audit by COUNTY.

CONTRACTOR's cost records, pertaining to EXTRA WORK paid for on a force account basis, shall be open to inspection or audit by representatives of the COUNTY, during the life of the CONTRACT, and for a period of not less than three (3) years after the date of acceptance thereof, and CONTRACTOR shall retain such records for that period. Where payment, for

materials or labor, is based on the cost thereof to forces other than CONTRACTOR, CONTRACTOR shall make ever reasonable effort to insure that the cost records of such other forces will be open to inspection and audit, by representatives of the COUNTY, on the same terms and conditions as the cost records of CONTRACTOR. If an audit is to be commenced more than sixty (60) DAYS after the acceptance date of the Contract, CONTRACTOR will be given a reasonable notice of the time when such audit is to be given.

4-5 PROCEDURE FOR RESOLVING CLAIMS

CONTRACTOR shall timely comply with any and all requirement of the CONTRACT DOCUMENTS pertaining to notices and requests for changes to the CONTRACT TIME or CONTRACT PRICE as a prerequisite to filing any claim governed by this Section. The failure to timely submit a notice of delay or notice of change, or to timely request a change to the time for completion or CONTRACTOR's compensation, or to timely provide any other notice or request required herein shall constitute a waiver of the right to further pursue the claim under the CONTRACT or at law.

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

B. **Claims.** For purposes of this Section, "Claim" means a separate demand by the CONTRACTOR for:
    a. An adjustment to the time for completion including, without limitation, for relief from damages or penalties for delay assessed by the COUNTY;
    b. Payment by the COUNTY of money or damages arising from WORK done by or on behalf of the CONTRACTOR pursuant to the CONTRACT, payment for which is not otherwise expressly provided or to which the CONTRACTOR is not otherwise entitled; or
    c. An amount the payment of which is disputed by the COUNTY.

    A "Claim" does not include any demand for payment for which the CONTRACTOR has failed to provide notice, request a CONTRACT CHANGE ORDER, or otherwise failed to follow any procedures contained in the CONTRACT DOCUMENTS.

C. **Filing Claims**. Claims governed by this Section may not be filed unless and until the CONTRACTOR completes any and all requirements of the CONTRACT DOCUMENTS pertaining to notices and requests for changes to the CONTRACT PRICE OR CONTRACT TIME, and CONTRACTOR'S request for a change has been denied in whole or in part. Claims governed by this Section must be filed no later than fourteen (14) days after a request for change has been denied in whole or in part or after any other event giving rise to the Claim. The Claim shall be submitted in writing to the COUNTY and shall include on its first page the following words in 16 point capital font: "THIS IS A CLAIM." The Claim shall include the all information and documents necessary to substantiate the Claim, including but not limited to those identified below. Nothing in this Section is intended to extend the time limit or supersede notice requirements otherwise provided by CONTRACT DOCUMENTS. Failure to follow such contractual requirements shall bar any Claims or subsequent proceedings for compensation or payment thereon.

D. **Documentation.** The CONTRACTOR shall submit all Claims in the following format:
   a. Summary description of Claim including basis of entitlement, merit and amount of time or money requested, with specific reference to the CONTRACT DOCUMENT provisions pursuant to which the Claim is made
   b. List of documents relating to Claim:
      i. Specifications
      ii. Drawings
      iii. Clarifications (Requests for Information)
      iv. Schedules
      v. Other
   c. Chronology of events and correspondence
   d. Narrative analysis of Claim merit
   e. Analysis of Claim cost, including calculations and supporting documents
   f. Time impact analysis in the form required by the CONTRACT DOCUMENTS or, if the CONTRACT DOCUMENTS do not require a particular format, CPM format, if an adjustment of the CONTRACT TIME is requested

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

   a. If the COUNTY needs approval from its governing body to provide the CONTRACTOR a written statement identifying the disputed portion and the undisputed portion of the Claim, and the COUNTY'S governing body does not

meet within the forty-five (45) DAYS or within the mutually agreed to extension of time following receipt of a Claim sent by registered mail or certified mail, return receipt requested, the COUNTY shall have up to three (3) DAYS following the next duly publicly noticed meeting of the COUNTY'S governing body after the forty-five (45) DAY period, or extension, expires to provide the CONTRACTOR a written statement identifying the disputed portion and the undisputed portion.

b. Within thirty (30) DAYS of receipt of a Claim, the COUNTY may request in writing additional documentation supporting the Claim or relating to defenses or Claims the COUNTY may have against the CONTRACTOR. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the COUNTY and the CONTRACTOR. The COUNTY'S written response to the Claim, as further documented, shall be submitted to the CONTRACTOR within thirty (30) DAYS (if the Claim is less than $50,000, within fifteen (15) DAYS after receipt of the further documentation, or within a period of time no greater than that taken by the CONTRACTOR in producing the additional information or requested documentation, whichever is greater.

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

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

a. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and

costs charged by its respective mediator in connection with the selection of the neutral mediator.

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

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

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

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

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

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

b. If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1114.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any

proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration. In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, (A) arbitrators shall, when possible, be experienced in construction law, and (B) any party appealing an arbitration award who does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, also pay the attorney's fees on appeal of the other party.

J. Government Code Claim Procedures.

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

b. In addition to any and all requirements of the CONTRACT DOCUMENTS pertaining to notices of and requests for adjustment to the CONTRACT TIME, CONTRACT PRICE, or compensation or payment for extra work, disputed WORK, construction claims and/or changed conditions, the CONTRACTOR must comply with the claim procedures set forth in Government Code Section 900, et seq. prior to filing any lawsuit against the COUNTY.

c. Such Government Code claims and any subsequent lawsuit based upon the Government Code claims shall be limited to those matters that remain unresolved after all procedures pertaining to adjustment of the CONTRACT TIME OR CONTRACT WORK for extra work, disputed work, construction claims, and/or changed conditions have been followed by CONTRACTOR. If CONTRACTOR does not comply with the Government Code claim procedure or the prerequisite contractual requirements, CONTRACTOR may not file any action against the COUNTY.

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

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

SECTION 5 - RESPONSIBILITIES OF THE CONTRACTOR

5-1 SUPERVISION AND SUPERINTENDENCE

1. CONTRACTOR shall supervise and direct the WORK competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the WORK in accordance with the CONTRACT DOCUMENTS. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence, or procedure of construction which is indicated in, and required by, the CONTRACT DOCUMENTS. CONTRACTOR shall be responsible to see that the finished WORK complies accurately with the CONTRACT DOCUMENTS.

2. CONTRACTOR shall keep on the site, at all times during its progress, a competent resident superintendent, who shall not be replaced without written notice to COUNTY and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

3. The right of general supervision shall not make the CONTRACTOR an agent of the COUNTY; and the liability of the CONTRACTOR for all damages to persons or to public or private property, arising from the execution of the WORK, shall not be lessened because of such general supervision.

5-2 LABOR, MATERIALS AND EQUIPMENT

1. CONTRACTOR shall provide competent, suitable qualified personnel to survey and lay out the WORK and perform construction as required by the CONTRACT DOCUMENTS. CONTRACTOR shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons, the WORK, or property at the site or adjacent thereto, and except as otherwise indicated in the CONTRACT DOCUMENTS.

2. Unless otherwise specified in the CONTRACT DOCUMENTS, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up, and completion of WORK.

3. All materials and equipment shall be good quality and new, except as otherwise provided in the CONTRACT DOCUMENTS. If required by ENGINEER,

CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable supplier except as otherwise provided in the CONTRACT DOCUMENTS.

5-3 DISMISSAL OF UNSATISFACTORY EMPLOYEES

If any person employed by CONTRACTOR or any SUBCONTRACTOR shall fail or refuse to carry out the directions of the ENGINEER, or is, in the opinion of the ENGINEER, incompetent, unfaithful, intemperate, or disorderly, or uses threatening or abusive language to any person representing the COUNTY on the WORK, or if otherwise unsatisfactory, he shall be removed from the WORK immediately, and shall not again be employed on the WORK except with the consent of the ENGINEER.

5-4 SUBCONTRACTING AND ASSIGNMENT

The performance of the CONTRACT may not be subcontracted or assigned except upon written consent of the COUNTY, and no such subcontracting or assignment shall be permitted which would relieve the CONTRACTOR or its surety of their responsibilities under the CONTRACT.

The CONTRACTOR shall not, without the written consent of the COUNTY: (a) substitute any SUBCONTRACTOR in place of the SUBCONTRACTOR designated in the original PROPOSAL, or (b) permit any such subcontract to be assigned or transferred, or allow it to be performed by anyone other than the SUBCONTRACTOR listed on the PROPOSAL. Consent to such substitution or subletting shall only be given pursuant to California Public Contract Code section 4107.

In the event of such substitution, the COUNTY shall give at least five (5) WORKING DAYS' notice, in writing, to the listed SUBCONTRACTOR, unless the said SUBCONTRACTOR involved has itself advised the COUNTY, in writing, that it has knowledge of the CONTRACTOR's request for the substitution.

CONTRACTOR may assign monies due or to become due him under the CONTRACT, and such assignment will be recognized by the COUNTY, if given proper notice thereof, to the extent permitted by law, but any assignment of monies shall be subject to all deductions provided for in the CONTRACT, and all money withheld shall be subject to being used by the COUNTY for the completion of the WORK, in the event that CONTRACTOR should be in default therein.

When any portion of the WORK which has been subcontracted by the CONTRACTOR is not being prosecuted in a satisfactory manner, the SUBCONTRACT for such WORK shall be terminated immediately by the CONTRACTOR upon written notice from the ENGINEER, and the SUBCONTRACTOR shall not again be employed on the type of WORK in which its performance was unsatisfactory.

No SUBCONTRACTOR will be recognized as such, and all persons engaged in the WORK under this CONTRACT will be considered as employees of CONTRACTOR, and their WORK shall be subject to all the provisions of the CONTRACT. The COUNTY and its representatives will deal only with CONTRACTOR who shall be responsible for the proper execution of the entire WORK.

5-5 THIRD PARTY CLAIMS

CONTRACTOR shall be responsible for all third party claims and for costs or injuries incurred by a third party which result from the operations of CONTRACTOR.

5-6 ASSIGNMENT OF ANTITRUST ACTIONS

Pursuant to Section 4551 of the Government Code of the State of California, the following provisions shall be a part of this CONTRACT:

> In entering into a Public Works Contract or a subcontract to supply goods, services, or materials pursuant to a Public Works Contract, CONTRACTOR or SUBCONTRACTOR offers and agrees to assign to the awarding body all right, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 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 Public Works Contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to CONTRACTOR without further acknowledgement by the parties.

5-7 CONTRACTOR'S SUBMITTALS

CONTRACTOR shall furnish all drawings, specifications, descriptive data, certificates, samples, tests, methods, schedules, and manufacturer's instructions as specifically required in the SPECIFICATIONS, and all other information as may reasonably be required to demonstrate fully that the materials and equipment to be furnished and the methods of WORK comply with the provisions and intent of the CONTRACT DOCUMENTS. Submittals shall be furnished by email with an accurate description in the subject line. Each submittal shall have a cover page with a submittal number and accurate description. Normally the submittal will be returned to CONTRACTOR within thirty (30) DAYS exclusive of any time as awaiting clarification or further information; however, the time for return will necessarily vary and may exceed thirty (30) DAYS depending upon the complexity of the submittal, the number of submittals, and the express needs of CONTRACTOR.

Electrical, instrumentation, control, and communication system drawings shall include elementary and loop diagram drawings, functional single line system layout drawings, connection drawings, interconnection drawings, panel/cabinet fabrication drawings, and

detailed circuit board and component drawings. Detailed circuit schematics and circuit board layout drawings shall be provided which clearly show, locate, and identify all components and wiring. Each circuit board component shall be identified by the component's original manufacturer name and part number. Industry standard part numbers shall be used. Component values, voltage\current levels, setpoints, and timing values shall be defined.

Complete annotated software/firmware source code listings and program documentation shall be provided for all electronic/electrical systems, subsystems, assemblies, parts, components, and equipment which incorporate programmable devices. All instructions and hardware necessary to load, store, modify, and activate software/firmware source codes and programs shall be provided.

All of the information required herein shall be provided even though it may be considered to be proprietary. If any of the information required herein is considered to be proprietary, the COUNTY's standard Proprietary Agreement shall be executed between the COUNTY and CONTRACTOR, stipulating that all such information will be supplied by CONTRACTOR and kept confidential by the COUNTY. All proprietary data shall be identified as a part of CONTRACTOR's PROPOSAL and the COUNTY's Standard Proprietary Agreement shall be executed before award of CONTRACT.

Not more than 70 percent of all electronic/electrical WORK shall be paid for until all proprietary information has been submitted and approved. All submitted proprietary information shall be that which describes the final as-built WORK. No part of the WORK covered by the Proprietary Agreement shall be modified after proprietary submittal acceptance until after updated proprietary information has been submitted by CONTRACTOR and accepted by the ENGINEER. Updated proprietary information shall fully document all modifications to be implemented. All proprietary data shall be marked "PROPRIETARY" by CONTRACTOR.

If the information furnished shows any deviation from the CONTRACT DOCUMENTS, CONTRACTOR shall, by a statement in writing accompanying the information, advise the ENGINEER of the deviation and state the reason therefor. It shall be CONTRACTOR's responsibility to ensure there is no conflict with other submittals and to notify the ENGINEER in any case where its submittal may concern work by another contractor of the COUNTY. CONTRACTOR shall also ensure coordination of submittals among all related crafts.

The approval of CONTRACTOR's drawings or other descriptive material shall not relieve CONTRACTOR of responsibility for any error or of any obligation for accuracy of dimensions and details, for agreement and conformity with the CONTRACT DOCUMENTS, or responsibility to fulfill the CONTRACT as prescribed. Nor shall such approval be considered as approval of any deviation or conflict unless the ENGINEER has been expressly advised of the same as set forth immediately above, and the ENGINEER has expressly approved such deviation or conflict.

No changes shall be made by CONTRACTOR in any drawing after it has been approved, and the equipment or materials shall not deviate in any way therefrom except with written approval by

the ENGINEER. Fabrication or other WORK performed in advance of approval shall be done entirely at CONTRACTOR's risk.

Where any item of WORK is required to be installed in accordance with the manufacturer's recommendations, CONTRACTOR shall furnish three (3) complete sets of these manufacturer's installation recommendations to the ENGINEER prior to starting this phase of the WORK.

For use in subsequent maintenance and operations, CONTRACTOR shall furnish, unless otherwise provided for in the CONTRACT DOCUMENTS, three (3) bound and indexed copies of maintenance and operation information supplied by the manufacturer covering all equipment and systems included in the CONTRACT. The submittal shall include, but not be limited to:

Drawings

Illustrations

Parts Lists

Wiring Diagrams of systems

Internal Wiring Diagrams and Circuit Board Schematics and Layout Drawings

Manufacturer's recommended spare parts lists

Name, address and telephone number of nearest parts and service agency

Systems Balance Data

Maintenance and Service Instructions

Software including Annotated Source Lists and Programs

This submittal is required for all mechanical, electrical, instrumentation, control, communications, sound, control or special equipment and systems. CONTRACTOR shall submit the required data for review at least thirty (30) days prior to the final inspection date. Corrections, additions, and/or resubmittal of data shall be made as directed by the ENGINEER.

The ENGINEER, and other persons as he may designate, shall receive complete maintenance and operating instructions for all items included above prior to final inspection of the project.

5-8 SURVEYS, LINES, AND GRADES

Unless specified otherwise in the CONTRACT DOCUMENTS, CONTRACTOR is to provide all surveys, CONTRACTOR shall be responsible to do all necessary survey to layout and control the WORK to the elevations, lines and, dimensions shown on the PLANS. Any deviations must receive prior approval of the ENGINEER. All surveys shall be performed by or under the direction and supervision of a Registered Civil Engineer or Licensed Land Surveyor, licensed by the State of California.

Unless authorized by the ENGINEER, any WORK done without line and grade will be done at CONTRACTOR's risk. CONTRACTOR shall be responsible for the accuracy of his own layout work, and shall be liable for the preservation of all established lines and grades.

The CONTRACTOR shall be responsible for survey work for the layout of work features, grade control and performance of the WORK. CONTRACTOR may, at his expense, verify COUNTY survey of vegetative cover thickness.

The CONTRACTOR shall be responsible for (1) any lines, grades, or measurements which do not comply with specified or proper tolerances, or which are otherwise defective and (2) any resultant defects in the WORK.

When the SPECIFICATIONS require bid schedule items of WORK to be measured by surveying methods, the COUNTY shall be responsible for performing the surveys before and after the WORK. The ENGINEER shall calculate final quantities for payment purposes. The CONTRACTOR shall be responsible for notifying the ENGINEER in advance of surveys for bid items.

The COUNTY will perform construction record as-built topographic surveys of the construction area immediately prior to the start of the WORK and at the completion of the WORK. The construction record as-built surveys shall be performed at a maximum 50-foot on-centers and at grade breaks. The CONTRACTOR shall not place other components of the construction until directed by the ENGINEER.

The CONTRACTOR reserves the right to perform any desired checking of COUNTY'S surveys and request correction if necessary, but this shall not relieve the CONTRACTOR of the responsibility for adequate performance of the WORK.

The CONTRACTOR shall include in its schedule sufficient time to allow completion of the surveying and give 24 hours' notice before survey will be necessary. No claims for extra costs or delays shall be made for standard surveying conducted to determine compliance with the SPECIFICATIONS.

The tolerances generally applicable in setting survey stakes shall be as set forth below. Such tolerances shall not supersede stricter tolerances required by the PLANS or SPECIFICATIONS, and shall not otherwise relieve the CONTRACTOR of responsibility for measurements in compliance therewith. The CONTRACTOR shall provide local construction control points prior to any excavation and earthwork. These points shall be field-verified by the ENGINEER.

TABLE 5-8

Survey Tolerances

Type of Line or Mark	Horizontal Position	Elevation

Permanent reference points	1 in 10,000	± .01 foot

5-9 RECORD DOCUMENTS

It shall be the responsibility of the CONTRACTOR to document all as-built conditions (with the exception of earthwork surveys performed by the COUNTY'S Third Party Surveyor), including any construction record surveys. CONTRACTOR shall maintain in good order, up-to-date and in a safe place at the site, one record copy of PROJECT DRAWINGS, SPECIFICATIONS, ADDENDA, CONTRACT CHANGE ORDERS, WORK DIRECTIVE CHANGES, FIELD ORDERS, approved samples, approved Shop Drawings, and written interpretations and clarifications. On these, CONTRACTOR shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the information represented in the CONTRACT DOCUMENTS, including buried or concealed construction and utility features which are revealed during construction ("Record Documents"). Red ink shall be used for alterations and notes.

These Record Documents will be available to ENGINEER for reference and review at any time. Failure on the CONTRACTOR's part to keep Record Documents current could result in withholding partial payment. Upon completion of the WORK, these Record Documents will be delivered to the ENGINEER for review and approval. Record Documents shall be submitted in both hard copy and electronic form.

The information submitted by CONTRACTOR will be assumed to be correct, and the CONTRACTOR shall be responsible for, and liable to COUNTY, for the accuracy of such information, and for any errors or omissions which may or may not appear on the Record Documents.

5-10 WEEKLY JOB MEETINGS

CONTRACTOR's representative shall be required to attend the Weekly Job Meetings as established by ENGINEER. At each meeting CONTRACTOR shall present:

a) Updated construction schedule (3 copies) and a written Weekly Progress Report including the statement regarding proposed measures to be taken to maintain the schedule, if such Weekly Progress Report is required by ENGINEER.

b) A set of up-to-date Record Documents.

Minutes of the meeting shall be prepared and distributed by the ENGINEER, and shall indicate action responsibility and target date.

During the period when the WORK is suspended pending delivery of materials and equipment, Weekly Job Meetings may be suspended by ENGINEER.

5-11 USE OF PREMISES

The COUNTY shall provide the lands, rights-of-way, and easements upon which the WORK under this CONTRACT is to be done, and such other lands as may be designated on the PROJECT DRAWINGS for the use of CONTRACTOR, and CONTRACTOR shall confine his operations to within these limits.

The COUNTY's existing facilities shall not be available to the CONTRACTOR. CONTRACTOR shall provide and maintain office space, sanitary and any other facilities necessary. Facilities supplied by the CONTRACTOR shall be in compliance with all applicable regulations and laws.

The COUNTY shall make available an area of land near the project site for the CONTRACTOR to park equipment, store materials, and locate a site office, if the CONTRACTOR desires. The exact location shall be determined by the ENGINEER. Access, security measures, and utilities shall be the responsibility of the CONTRACTOR. CONTRACTOR shall clean the area so used and return it to its original condition, or better, upon completion of the WORK.

CONTRACTOR shall provide, at his own expense, any additional land and access thereto that may be required for temporary construction facilities or storage of materials.

CONTRACTOR shall use the construction gate on west perimeter fence for access by large or heavy equipment. CONTRACTOR is responsible for providing his own lock that is acceptable to the COUNTY and identified by a unique mark and registered with the ENGINEER. CONTRACTOR is responsible for keeping the gate locked at all times when not in use. Failure to lock the gate when gate is not being controlled by CONTRACTOR’s personnel or after its use will result in a deduction of $500 per occurrence form the CONTRACTOR’S progress pay estimate.

CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers, to the PROJECT site and land and areas identified in and permitted by the CONTRACT DOCUMENTS and other land and areas permitted by laws and regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any land or areas contiguous thereto, resulting from the performance of the WORK. Should any claim be made against the COUNTY or the ENGINEER by any such owner or occupant because of the performance of the WORK, CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law.

During the progress of the WORK, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish, and other debris resulting from the WORK. If Contractor’s activities expose waste or litter, CONTRACTOR shall pick up and dispose within 24 hours. At the completion of the WORK, CONTRACTOR shall remove all waste materials, rubbish and, debris from and about the premises as well as all tools, appliances, construction

equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by the COUNTY. At the end of each day, from October 1 thru April 30, the CONTRACTOR shall verify that the entire work area was left in a state that promotes surface drainage off and away from the area and from finished WORK. CONTRACTOR shall restore to original condition all property not designated for alteration by the CONTRACT DOCUMENTS.

CONTRACTOR shall not load, nor permit any part of any structure to be loaded, in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the WORK or adjacent property to stresses or pressures that will endanger it.

5-12 WATER

CONTRACTOR shall develop a water supply as required for the WORK. The COUNTY shall permit CONTRACTOR to use water obtained from a water source designated on the PLANS and in Section 11-11. The CONTRACTOR shall be responsible for all pumps, piping, and equipment necessary to obtain the water and use it for construction purposes.

No direct extractions from, or additions to, the groundwater shall be made unless approved by the ENGINEER.

5-13 DUST CONTROL

The CONTRACTOR shall be responsible for providing adequate dust control measures in the entire Work area during the term of the CONTRACT. Dust palliatives shall not be used without written authorization of the ENGINEER.

CONTRACTOR shall provide for dust control by spraying with water or other approved dust control product as necessary to the satisfaction of the ENGINEER during all WORK activities.

Dust control shall consist of furnishing water, required equipment, additives, accessories, and incidentals, and carrying out proper and efficient measures wherever and as often as necessary to reduce dust nuisance, and to prevent dust originating from construction operations during the completion of the CONTRACT, as required by the COUNTY/ENGINEER

No separate payment shall be made for any work performed or material used to control dust resulting from the CONTRACTOR's performance of the WORK, either inside or outside the right of way. Full compensation for such dust control shall be considered as included in the prices paid for the various items of WORK involved.

5-14 TRAFFIC CONTROL

Attention is directed to Sections 8-6, "Public Convenience," and 8-7, "Public Safety," of the GENERAL PROVISIONS. Nothing in this section shall be construed as relieving the CONTRACTOR from his responsibility as provided in said Section 8-7.

No WORK that requires a lane closure shall be performed without the approval of the ENGINEER.

The CONTRACTOR shall submit to the COUNTY, for approval, a traffic plan. At a minimum, the traffic plan shall include the following:

1. Traffic flow pattern, including CONTRACTOR's equipment and landfill traffic flow patterns;
2. Alternate routes for CONTRACTOR's equipment and/or landfill traffic;
3. Times of day and schedule for traffic operations;
4. Locations of signs and traffic control devices and their types (if required); and
5. Number and location of flag persons (if required).

5-15 DIFFERING SITE CONDITIONS

If the WORK involves excavating trenches or other excavations that extend deeper than four (4) feet below the surface, the CONTRACTOR shall promptly, and before the following conditions are disturbed, notify the COUNTY in writing, of any:

a) 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.

b) Subsurface or latent physical conditions at the site differing materially from those indicated by information about the site made available to BIDDERS prior to the deadline for submitting bids.

c) Unknown physical conditions at the site of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the CONTRACT DOCUMENTS.

The COUNTY shall promptly investigate said conditions, and if the COUNTY finds that said conditions do materially differ from conditions indicated in the CONTRACT DOCUMENTS, the COUNTY shall issue a CONTRACT CHANGE ORDER, increasing or decreasing CONTRACT TIME or CONTRACT PRICE or both, as appropriate, as provided for in these GENERAL PROVISIONS. If the CONTRACTOR is unable to perform or subcontract the work due, the COUNTY shall perform the WORK under separate contract.

In the event of a dispute, the CONTRACTOR shall not be excused from the CONTRACT TIME, but shall proceed with all WORK to be performed under the CONTRACT. The CONTRACTOR shall retain any and all rights provided either by CONTRACT or by law which pertains to the resolution of disputes and protests between the contracting parties.

5-16 QUALITY CONTROL

The CONTRACTOR is responsible for the quality of WORK performed under this CONTRACT. The ENGINEER shall provide additional testing and inspection for quality control as required by the TECHNICAL PROVISIONS and the CONSTRUCTION QUALITY ASSURANCE (CQA) PLAN. The CONTRACTOR must meet the requirements of the TECHNICAL PROVISIONS and the CQA PLAN to the satisfaction of the ENGINEER. The CONTRACTOR must meet all requirements of all manufacturer's warranties so as to maintain validity of the warranties. Neither the making nor the failure to inspect and test by the ENGINEER or the expressed or implied approval by the ENGINEER of any part of the WORK shall relieve the CONTRACTOR of the responsibility to complete and guarantee the WORK as specified.

References herein to materials testing apply to tests performed by an independent consultant, materials testing laboratory, or the COUNTY, at the COUNTY's expense.

5-17 STORM WATER POLLUTION PREVENTION

Storm, surface, ground, nuisance, or other waters may be encountered at various times during construction of the WORK. Therefore, the CONTRACTOR hereby acknowledges that it has investigated the risk arising from such waters, has prepared its PROPOSAL accordingly, and assumes any and all risks and liabilities arising therefrom.

No separate payment shall be allowed for the diversion and control of water. All costs to maintaining dry working areas shall be included in the unit prices paid for other items of WORK in the PROPOSAL.

CONTRACTOR shall keep itself and SUBCONTRACTORS, staff, and employees fully informed of and in compliance with all local, state and federal laws, rules and regulations that may impact, or be implicated by the performance of the WORK including, without limitation, all applicable provisions regulating discharges of storm water; the Federal Water Pollution Control Act (33 U.S.C. § 13000 et seq.); the California Porter-Cologne Water Quality Control Act (Cal Water Code §§ 13000-14950); and any and all regulations, policies, or permits issued pursuant to any such authority.

CONTRACTOR shall comply with all conditions of the State Water Resources Control Board (“State Water Board”) National Pollutant Discharge Elimination System General Permit for Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity (“Construction General Permit”) for all construction activity which results in the disturbance of in excess of one acre of total land area or which is part of a larger common area of development or sale. CONTRACTOR shall comply with the lawful requirements of the COUNTY, and any other applicable municipality, drainage district, or other local agency with jurisdiction over the location where the WORK is to be conducted, regarding discharges of

storm water to separate storm drain systems or other watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs.

The CONTRACTOR shall comply with all requirements of the Storm Water Pollution Prevention Program (SWPPP) for the site, and implement a drainage and erosion control plan for the duration of the PROJECT. The CONTRACTOR shall determine necessary interim drainage measures required for the WORK area. The CONTRACTOR assumes all responsibility for protection of his WORK from damages due to storm water erosion, etc. for the duration of the PROJECT. All costs relative to compliance with the SWPPP as well as drainage and erosion control shall be included in the cost of the various items of WORK and no additional compensation shall be made therefore. Copies of the SWPPP for the site are available through the Yolo County Central Landfill.

Failure to comply with the Construction General Permit, laws, regulations, and ordinances listed in this Section is a violation of federal and state law. Notwithstanding any other indemnity contained in the CONTRACT DOCUMENTS, CONTRACTOR agrees to indemnify and hold harmless the COUNTY its officials, officers, agents, employees and authorized volunteers from and against any and all claims, demands, fees, costs, expenses, or losses or liabilities of any kind or nature which the COUNTY, its officials, officers, agents, employees and authorized volunteers may sustain or incur for noncompliance with the Permit, laws, regulations, and ordinances listed above, arising out of or in connection with the WORK, except for liability resulting from the sole established negligence, willful misconduct or active negligence of the COUNTY, its officials, officers, agents, employees or authorized volunteers.

All fines imposed by regulating agencies related to compliance with the SWPPP are the responsibility of the CONTRACTOR. The COUNTY reserves the right to defend any enforcement action or civil action brought against the COUNTY for CONTRACTOR's failure to comply with any applicable water quality law, regulation, or policy. CONTRACTOR hereby agrees to be bound by, and to reimburse the COUNTY for the costs associated with, any settlement reached between the COUNTY and any relevant enforcement entity.

5-18 AIR POLLUTION CONTROL

CONTRACTOR shall comply with all air pollution control rules, regulations, ordinances and statutes. All containers of paint, thinner, curing compound, solvent or liquid asphalt shall be labeled to indicate that the contents fully comply with the applicable material requirements.

Without limiting the foregoing, CONTRACTOR must fully comply with all applicable laws, rules and regulations in furnishing or using equipment and/or providing services, including, but not limited to, emissions limits and permitting requirements imposed by the Air Quality Management District with jurisdiction over the PROJECT and/or California Air Resources Board (CARB). CONTRACTOR shall specifically be aware of the application of these limits and

requirements to "portable equipment", which definition is considered includes any item of equipment with a fuel-powered engine.

5-19 OTHER OBLIGATIONS AND RESPONSIBILITIES

Other CONTRACTOR's obligations and responsibilities shall be as set forth elsewhere in this GENERAL PROVISIONS, or elsewhere in the CONTRACT DOCUMENTS.

SECTION 6 - CONTROL OF WORK, INSPECTIONS AND ACCEPTANCE OF WORK

6-1 AUTHORITY OF THE ENGINEER

The ENGINEER shall decide all questions as to the quality or acceptability of materials furnished and WORK performed, as to the manner of performance and rate of progress of the WORK, as to the interpretation of the PLANS and SPECIFICATIONS, as to the acceptable fulfillment of the CONTRACT on the part of the CONTRACTOR, and as to compensation. The ENGINEER's decision shall be final and shall include the authority to enforce and make effective such decisions and orders which the CONTRACTOR fails to carry out promptly.

6-1.1 FIELD ORDERS

At any time and from time to time during the course of the WORK, the ENGINEER may, with respect to any part or parts of the WORK, issue, in writing to CONTRACTOR, a FIELD ORDER. CONTRACTOR shall comply with the requirements of such FIELD ORDER forthwith or within such time as may be specified therein.

FIELD ORDERS will be used to order or delete WORK, reject WORK or note deficiencies, clarify CONTRACT requirements or documents, or any other matters.

6-2 PLANS AND SHOP DRAWINGS

The CONTRACT PLANS furnished consist of general drawings and show such details as are necessary to give a comprehensive idea of the construction contemplated. All authorized alterations affecting the requirements and information given on the CONTRACT PLANS shall be in writing.

The PLANS shall be supplemented by such Shop Drawings prepared by the CONTRACTOR as are necessary to adequately control the WORK, as specified in Section 5-8, herein. No change shall be made by CONTRACTOR in any Shop Drawing after they have been approved by the ENGINEER.

Full compensation for furnishing all Shop Drawings shall be considered as included in the prices paid for the CONTRACT items of WORK to which such drawings relate, and no additional compensation will be allowed therefor.

6-3 CONFORMITY WITH CONTRACT DOCUMENTS AND ALLOWABLE DEVIATIONS

WORK and materials shall conform to the lines, grades, cross sections, dimensions and material requirements, including tolerances, shown on the PLANS or indicated in the SPECIFICATIONS.

Although measurement, sampling, and testing may be considered evidence of conformity, the ENGINEER shall be the sole judge of whether the WORK or materials deviate from the PLANS and SPECIFICATIONS. The ENGINEER's decision shall be final as to any allowable deviations therefrom.

6-4 COORDINATION AND INTERPRETATION OF PLANS, STANDARD SPECIFICATIONS, AND TECHNICAL PROVISIONS

These CONTRACT DOCUMENTS including the STANDARD SPECIFICATIONS (GENERAL PROVISIONS, SPECIAL PROVISIONS, STANDARD CONSTRUCTION SPECIFICATIONS), the STANDARD DRAWINGS, PROJECT DRAWINGS, TECHNICAL PROVISIONS, CONTRACT CHANGE ORDERS, ADDENDA, and all supplementary documents are essential parts of the CONTRACT, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary, and to describe and provide for a complete WORK.

Where conflicts exist between the CONTRACT DOCUMENTS, such conflicts shall be clarified according to the following order, the first ranked taking precedence over the lower ranked:

CONTRACT CHANGE ORDERS
ADDENDA
SPECIAL PROVISIONS
TECHNICAL PROVISIONS
PROJECT DRAWINGS
CONTRACT
STANDARD DRAWINGS
GENERAL PROVISIONS
STANDARD CONSTRUCTION SPECIFICATIONS
Notice to Contractors
PROPOSAL
Reference Specifications
Approved Shop Drawings

Should it appear that the WORK to be done, or any of the matters relative thereto, are not sufficiently detailed or explained in the CONTRACT DOCUMENTS, CONTRACTOR shall apply to the ENGINEER for such further explanations as may be necessary. CONTRACTOR shall conform to any such further explanations as part of the CONTRACT. In the event of any doubt or question arising respecting the true meaning of the CONTRACT DOCUMENTS, reference shall be made to the ENGINEER whose decision thereon shall be final.

With reference to PROJECT DRAWINGS or STANDARD DRAWINGS, the order of precedence shall always be as follows:

Figures govern over scaled dimensions; and

Detail drawings govern over general drawings

Notwithstanding the orders of precedence established above, in the event of conflicts, the higher standard, higher quality and most expensive shall always apply.

6-5 ORDER OF WORK

When required by the SPECIAL PROVISIONS or PLANS, the CONTRACTOR shall follow the sequence of operations as set forth therein.

Full compensation for conforming to such requirements will be considered as included in the prices paid for the various CONTRACT items of WORK, and no additional compensation will be allowed therefor.

6-6 INSPECTION

The ENGINEER shall at all times have access to the WORK during its construction, and shall be furnished with every reasonable facility for ascertaining that the materials and the workmanship are in accordance with the requirements and intentions of the CONTRACT DOCUMENTS. All WORK done and all materials furnished shall be subject to the ENGINEER's inspection.

The inspection of the WORK or materials shall not relieve CONTRACTOR of any obligations to fulfill the CONTRACT as prescribed. WORK and materials not meeting such requirements shall be made good. Unsuitable WORK or materials may be rejected, notwithstanding that such WORK or materials have been previously included in a progress estimate.

The PROJECT shall be subject to inspection at all times by the State, Federal, or other appropriate agency.

CONTRACTOR shall give twenty-four (24) hours' notice when an inspection is required. This notice shall be given at the office of the ENGINEER. Any WORK constructed without inspection as provided above, except with the specific consent or approval of the ENGINEER, or constructed contrary to the instructions or orders of the ENGINEER or his authorized representative, must, if requested by the ENGINEER, be uncovered for examination and properly restored at the CONTRACTOR's expense.

Properly authorized INSPECTORS shall be considered to be representatives of the ENGINEER. It will be their duty to inspect those portions of the WORK to which they are assigned. An INSPECTOR shall have the authority to order the WORK entrusted to their supervision stopped,

if in their opinion such action becomes necessary, until the ENGINEER is notified and has determined and ordered that the WORK may proceed in due fulfillment of all CONTRACT requirements.

Re-examination of any WORK may be ordered by the ENGINEER, and such WORK must be uncovered by the CONTRACTOR. The CONTRACTOR shall pay the entire cost of such uncovering, re-examination, and replacement if the WORK does not conform to the CONTRACT DOCUMENTS.

6-7 SUGGESTIONS TO CONTRACTOR ADOPTED AT OWN RISK

Any plan or method of work suggested by the ENGINEER to CONTRACTOR, but not specified or required, if adopted or followed by CONTRACTOR in whole or in part, shall be used at the risk and responsibility of CONTRACTOR, and the ENGINEER and the COUNTY shall assume no responsibility therefor.

6-8 REMOVAL OF REJECTED AND UNAUTHORIZED WORK

All WORK which has been rejected shall be remedied, or removed, and replaced by CONTRACTOR in an acceptable manner without compensation for such removal, replacement, or remedial WORK.

Any work done beyond the lines and grades shown on the PLANS, or as established by the ENGINEER, or any EXTRA WORK done without written authority, will be considered as unauthorized work and no payment will be made therefor.

Upon order of the ENGINEER, unauthorized work shall be remedied, removed, or replaced at CONTRACTOR's expense.

Upon failure of CONTRACTOR to comply promptly with any order of the ENGINEER made under this Section, the COUNTY may cause rejected or unauthorized work to be remedied, removed, or replaced, and to deduct the costs from any money due or to become due CONTRACTOR.

6-9 FINAL INSPECTION, FIELD ACCEPTANCE, AND ACCEPTANCE BY THE BOARD

The ENGINEER will not make the final inspection until the WORK provided and contemplated by the CONTRACT has been completed, including the satisfactory performance of all functional and operation testing, and the final cleaning up performed. CONTRACTOR shall notify the ENGINEER, in writing, of the completion of the WORK, and the ENGINEER shall promptly inspect the WORK. CONTRACTOR or his representative may be present at the inspection. Upon his

inspection of the WORK the ENGINEER shall notify CONTRACTOR, in writing, of any deficiencies to be remedied prior to final acceptance, by preparing a PUNCH LIST.

CONTRACTOR shall remedy all items shown on the PUNCH LIST prior to final acceptance by the ENGINEER.

The ENGINEER is not authorized to amend the CONTRACT by use of the PUNCH LIST. It is provided solely for the benefit of CONTRACTOR to enable determination of what items must be corrected before FIELD ACCEPTANCE LETTER can be issued by the ENGINEER.

CONTRACTOR will be notified in writing of any defects or deficiencies to be remedied. Within ten (10) calendar days of receiving the PUNCH LIST, CONTRACTOR shall proceed to correct such defects or deficiencies. When notified that WORK has been completed, the ENGINEER will again inspect the WORK to satisfy himself that all WORK has been done in accordance with the CONTRACT DOCUMENTS, and will issue a FIELD ACCEPTANCE LETTER and will recommend to the BOARD OF SUPERVISORS that they formally accept the CONTRACT.

The COUNTY reserves the right to require compliance with the CONTRACT DOCUMENTS, notwithstanding the issuance of a PUNCH LIST, or the completion by 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, but accepted by the COUNTY, without the issuance of further PUNCH LISTS.

Field acceptance by the ENGINEER shall not bind the BOARD OF SUPERVISORS to formal acceptance, nor relieve CONTRACTOR from the responsibility of completing or correcting any WORK. Within ten (10) days of acceptance by the BOARD OF SUPERVISORS, a Notice of Completion will be filed with the County Recorder of Yolo County.

SECTION 7 - CONTROL OF MATERIALS

7-1 SOURCE OF SUPPLY AND QUALITY OF MATERIALS

CONTRACTOR shall furnish all materials required to complete the WORK, except materials that are designated in the CONTRACT DOCUMENTS to be furnished by the COUNTY.

Only materials conforming to the requirements of the CONTRACT DOCUMENTS shall be incorporated in the WORK.

The materials furnished and used shall be new except as may be provided elsewhere in the CONTRACT DOCUMENTS. The materials shall be manufactured, handled, and used in an expert manner to ensure completed WORK in accordance with the PLANS and SPECIFICATIONS.

Materials to be used in the WORK will be subject to inspection and tests by the ENGINEER or designated representative. CONTRACTOR shall furnish, without charge, such samples as may be required. CONTRACTOR shall furnish the ENGINEER a list of his sources of materials and the locations at which such materials will be available for inspection. The ENGINEER may inspect, sample, or test materials at the source of supply or other locations. But such inspection, sampling, or testing will not be undertaken until the ENGINEER is assured by CONTRACTOR of the cooperation and assistance of both CONTRACTOR and the supplier of the material. CONTRACTOR shall assure that the ENGINEER or authorized representative has free access at all times to the material to be inspected, sampled, or tested. It is understood that such inspections and tests if made at any point other that the point of incorporation in the WORK, in no way shall be considered as a guaranty of acceptance of such material, nor of continued acceptance of material presumed to be similar to that upon which inspections and tests have been made. Inspection and testing so performed shall not relieve CONTRACTOR or suppliers of responsibility for quality control.

Manufacturer’s warranties, guaranties, instruction sheets, and parts lists which are furnished with certain articles or materials incorporated in the WORK, shall be delivered to the ENGINEER before acceptance of the CONTRACT.

Reports and records of inspections made, and tests performed, when available at the site of the WORK, may be examined by CONTRACTOR.

7-2 COUNTY FURNISHED MATERIALS

Upon request of CONTRACTOR, materials furnished by the COUNTY will be made available to him within a reasonable time at the points designated in the SPECIAL CONDITIONS. They shall be loaded and hauled to the site of the WORK by CONTRACTOR, at CONTRACTOR's expense. The cost of handling and placing all materials shall be considered as included in the CONTRACT prices for the items in connection with which they are used.

CONTRACTOR will be held responsible for all received material, and deductions will be made from any money due CONTRACTOR to make good any shortages and deficiencies, from any cause whatsoever, which may occur after materials were received by CONTRACTOR.

7-3 STORAGE OF MATERIALS

Articles or materials to be incorporated in the WORK shall be stored in such a manner as to ensure the preservation of their quality and fitness for the WORK, and to facilitate inspection.

7-4 DEFECTIVE MATERIALS

All materials which the ENGINEER has determined do not conform to the requirements of the CONTRACT DOCUMENTS will be rejected whether in place or not. They shall be removed immediately from the site of the WORK, unless otherwise permitted by the ENGINEER. No rejected materials, the defects of which have been subsequently corrected, shall be used in the WORK unless approval, in writing, has been given by the ENGINEER. Upon failure of CONTRACTOR to comply promptly with any order of the ENGINEER made under the provisions in this Section 7-4, the ENGINEER shall have authority to cause the removal and replacement of rejected material and to deduct the cost thereof from any money due or to become due CONTRACTOR.

7-5 TRADE NAMES AND ALTERNATIVES

For convenience in designation on the PLANS or SPECIFICATIONS, certain articles or materials to be incorporated in the WORK are designated under a trade name or the name of a manufacturer and his catalogue information. The use of an alternative article or material which is of equal quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:

The burden of proof as to the quality and suitability of alternatives shall be upon CONTRACTOR who shall furnish all information necessary as required by the ENGINEER. The ENGINEER shall be the sole judge as to the quality and suitability of alternative articles or materials and shall make all final decisions. Whenever the SPECIFICATIONS permit the substitution of a similar or equivalent material or article, no tests or action relating to the approval of such substitute material will be made until the request for substitution is made in writing by the CONTRACTOR. Such written request shall be accompanied by complete data as to the equality of the material or article proposed. Such request shall be made no later than thirty-five (35) DAYS after award of CONTRACT and in ample time to permit approval without delaying the WORK. Provisions regarding submission of substitution requests shall not in any way authorize an extension of time for the performance of this CONTRACT. If a substitution request is rejected by the COUNTY, the CONTRACTOR shall provide the articles or materials specified herein. The

COUNTY shall not be responsible for any costs incurred by the CONTRACTOR associated with substitution requests.

7-6 PLANT INSPECTION

The ENGINEER may inspect the production of material, or the manufacture of products at the source of supply. Plant inspection, however, will not be undertaken until the ENGINEER is assured of the cooperation and assistance of both the CONTRACTOR and the supplier. The ENGINEER or an authorized representative shall have free entry at all times to such parts of the plant as concern the manufacture or production of the materials. Adequate facilities shall be furnished free of charge to make the necessary inspection. The COUNTY assumes no obligation to inspect materials at the source of supply.

7-7 CERTIFICATES OF COMPLIANCE

A Certificate of Compliance shall be furnished prior to the use of any materials for which the CONTRACT DOCUMENTS require that such a certificate be furnished. In addition, when so authorized in the CONTRACT DOCUMENTS, the ENGINEER may permit the use of certain materials or assemblies prior to sampling and testing if accompanied by a Certificate of Compliance. The certificate shall be signed by the manufacturer of the material or the manufacturer of assembled materials and shall state that the materials involved comply in all respects with the requirements of the SPECIFICATIONS. A Certificate of Compliance shall be furnished with each lot of material delivered to the WORK and the lot so certified shall be clearly identified in the certificate.

All materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that material is used on the basis of a Certificate of Compliance shall not relieve CONTRACTOR of responsibility for incorporating material in the WORK which conforms to the requirement of the CONTRACT DOCUMENTS, and any such material not conforming to such requirements will be subject to rejection whether in place or not. The COUNTY reserves the right to refuse to permit the use of material on the basis of a Certificate of Compliance.

The form of the Certificate of Compliance and its disposition shall be as directed by the ENGINEER.

7-8 TESTING

Unless otherwise specified, all tests shall be performed in accordance with the methods used by the California Department of Transportation (CALTRANS) and shall be made by the ENGINEER or a designated representative.

CALTRANS has developed methods for testing the quality of materials and work. These methods are identified by number and are referred to in the SPECIFICATIONS as California Test.

Copies of individual California Tests are available at the CALTRANS Transportation Laboratory, Sacramento, California.

Whenever a reference is made in the SPECIFICATIONS to a California Test by number, it shall mean the California Test in effect on the day the Notice to Contractors for the WORK is dated.

Whenever the SPECIFICATIONS provide an option between two or more tests, the ENGINEER will determine the test to be used.

Whenever a reference is made in the SPECIFICATIONS to a specification, manual, or test designation either of the American Society for Testing and Materials, the American Association of State Highway and Transportation Officials, Federal Specifications, or any other recognized national organization, and the number or other identification representing the year of adoption or latest revision is omitted, it shall mean the specification, manual, or test designation in effect on the day the Notice of Contractors for the WORK is dated. Whenever said specification, manual or test designation provides for test reports (such as certified mill test reports) from the manufacturer, copies of such reports, identified as to the lot of material, shall be furnished to the ENGINEER or CONTRACTOR. The manufacturer's test reports shall supplement the inspection, sampling, and testing provisions in this Section 7, "Control of Materials," and shall not constitute a waiver of the COUNTY's right to inspect. When material which cannot be identified with specific test reports in proposed for use, the ENGINEER may select random samples from the lot for testing. Test specimens from the random samples, including those required for retest, shall be prepared in accordance with the referenced specification and furnished and paid for by CONTRACTOR. The number of such samples and test specimens shall be entirely at the discretion of the ENGINEER.

When requested by the ENGINEER, CONTRACTOR shall furnish, without charge, samples of all materials entering into the WORK, and no material shall be used prior to approval by the ENGINEER, except as provided in Section 7-7, "Certificates of Compliance."

The COUNTY will pay for all initial testing unless specified otherwise in the CONTRACT DOCUMENTS. In the event of failing tests, CONTRACTOR shall make arrangements for and pay the cost of subsequent retesting. Retests shall be made by the same company that performed initial testing. Type, location, and number of tests to be taken shall be determined by the ENGINEER.

SECTION 8 - LEGAL RELATIONS AND RESPONSIBILITY

8-1 LAWS TO BE OBSERVED

CONTRACTOR shall keep itself fully informed of all existing and future State and Federal laws, and COUNTY and municipal ordinances and regulations which in any manner affect those engaged or employed in the WORK, or the materials used in the WORK, or which in any way affect the conduct of the WORK, and with all such orders and decrees of bodies or tribunals having any jurisdiction or authority over same.

CONTRACTOR shall at all times observe and comply with all existing laws, ordinances, regulations, orders, and decrees of bodies or tribunals having any jurisdictional authority over the WORK; and shall cause all agents and employees of the CONTRACTOR to do the same. CONTRACTOR shall indemnify and hold harmless the COUNTY, its officers, agents, and employees from any and all claims or liabilities, including, but not limited to, fines and penalties arising from, or based on the violation of any such law, ordinance, regulation, order, or decree, whether by CONTRACTOR or CONTRACTOR's agents and employees. If any discrepancy or inconsistency is discovered in the CONTRACT DOCUMENTS for the WORK in relation to any such law, ordinance, regulation, order or decree, CONTRACTOR shall forthwith report the same to the ENGINEER in writing.

8-1.1 HOURS OF LABOR

Eight (8) hours labor constitutes a legal day's work. CONTRACTOR shall forfeit, as a penalty to the COUNTY, Twenty-Five Dollars ($25) for each worker employed in the execution of the CONTRACT, by the CONTRACTOR or any SUBCONTRACTOR, for each calendar day during which such worker is required, or permitted, to work more than eight (8) hours in any one calendar day, or more than forty (40) hours in any one calendar week, in violation of the provisions of the Labor Code of the State of California, and in particular, Section 1810 to Section 1814, thereof, inclusive. Notwithstanding the provisions of Section 1810 to Section 1814, WORK performed by employees of the CONTRACTOR in excess of eight (8) hours per day, and forty (40) hours during any one week, shall be permitted upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay, as provided in Section 1815.

8-1.2 PREVAILING WAGE

CONTRACTOR is aware of the requirements of Labor Code sections 1720 et seq. and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq. (“Prevailing Wage Laws”), which require the payment of prevailing wage rates and the performance of other requirements on certain “public works” and “maintenance” projects. Since this project involves an applicable “public works” or “maintenance” project, as defined by the Prevailing Wage Laws, and since the total compensation is One Thousand Dollars $1,000 or more, CONTRACTOR

agrees to fully comply with such Prevailing Wage Laws. CONTRACTOR shall obtain a copy of the prevailing rates of per diem wages at the commencement of this CONTRACT from the website of the Division of Labor Statistics and Research of the Department of Industrial Relations located at www.dir.ca.gov. In the alternative, CONTRACTOR may view a copy of the prevailing rate of per diem wages which are on file at the DEPARTMENT and shall be made available to interested parties upon request. CONTRACTOR shall make copies of the prevailing rates of per diem wages for each craft, classification, or type of worker needed to perform work on the project available to interested parties upon request, and shall post copies at the CONTRACTOR'S principal place of business and at the project site, including a schedule showing all determined general prevailing wage rates and all authorized deductions, if any, from unpaid wages actually earned. CONTRACTOR shall defend, indemnify and hold the COUNTY, its officials, officers, employees and authorized volunteers free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or allege failure to comply with the Prevailing Wage Laws.

CONTRACTOR shall comply with Labor Code sections 1774 and 1775. In accordance with section 1775, CONTRACTOR shall forfeit as penalty to the COUNTY, Two Hundred Dollars ($200.00) for each calendar day or portion thereof, for each worker paid less than the prevailing rates. In addition to said penalty and pursuant to said Section 1775, the difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by CONTRACTOR.

The COUNTY will not recognize any claim for additional compensation because of the payment by CONTRACTOR of any wage rate in excess of the prevailing wage rate set forth at the time of executing the CONTRACT. The possibility of wage increases is one of the elements to be considered by CONTRACTOR in determining a bid, and will not under any circumstances be considered as the basis of a claim against the COUNTY on the CONTRACT.

8-1.3 PAYROLL RECORDS

Pursuant to Labor Code section 1776, CONTRACTOR and SUBCONTRACTORS shall maintain weekly certified payroll records, showing the names, addresses, Social Security numbers, work classifications, 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 them in connection with the WORK under this CONTRACT. CONTRACTOR shall certify under penalty of perjury that records maintained and submitted by CONTRACTOR are true and accurate. CONTRACTOR shall also require SUBCONTRACTORS to certify weekly payroll records under penalty of perjury.

In accordance with Labor Code section 1771.4, CONTRACTOR AND SUBCONTRACTOR shall furnish the certified payroll records directly to the Department of Industrial Relations on the specified interval and format prescribed by the Department of Industrial Relations, which may

include electronic submission. CONTRACTOR shall comply with all requirements and regulations from the Department of Industrial Relations relating to labor compliance monitoring and enforcement. The requirement to submit certified payroll records directly to the Labor Commissioner under Labor Code section 1771.4 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Section 1771.4.

The payroll records described herein shall be certified and submitted by the CONTRACTOR at a time designated by the COUNTY. CONTRACTOR shall also provide the following:

B. A certified copy of the employee's payroll records shall be made available for inspection or furnished to such employee or his or her authorized representative on request.

C. A certified copy of all payroll records described herein shall be made available for inspection or furnished upon request of the Department of Industrial Relations.

Unless submitted electronically, the certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement ("DLSE") of the Department of Industrial Relations or shall contain the same information as the forms provided by the DLSE.

Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency, COUNTY, the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address and social security number. The name and address of the CONTRACTOR awarded the CONTRACT or performing the CONTRACT shall not be marked or obliterated.

In the event of noncompliance with the requirements of this Section, CONTRACTOR shall have ten (10) DAYS in which to comply subsequent to receipt of written notice specifying in what respects the CONTRACTOR must comply with this Section. Should noncompliance still be evident after such 10-day period, CONTRACTOR shall pay a penalty of One Hundred Dollars ($100.00) to COUNTY for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, such penalties shall be withheld from progress payment then due.

CONTRACTOR and each SUBCONTRACTOR shall preserve their payroll records for a period of three (3) years from the date of completion of the CONTRACT.

The responsibility for compliance with this Section shall rest upon the CONTRACTOR.

8-1.4 LABOR NONDISCRIMINATION

Attention is directed to Section 1735 of the Labor Code of the State of California, which reads as follows:

> "No discrimination shall be made in the employment of persons upon public works because of race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, or sex of such persons, except as provided in Section 12940 of the Government Code, and every Contractor for public works violating this Section is subject to all the penalties imposed for a violation of this Chapter."

CONTRACTOR's attention is also directed to the requirements of the California Fair Employment and Housing Act (Government Code Sections 12900 et. seq.), to the regulations promulgated by the Fair Employment and Housing Commission to implement said Act, and to the nondiscrimination, affirmative action, and equal employment opportunity requirements in the CONTRACT DOCUMENTS.

Pursuant to the above and other applicable provisions of law, CONTRACTOR and SUBCONTRACTOR shall not discriminate against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation, or any other classifications protected by law on this project. CONTRACTOR will take affirmative action to insure that employees are treated during employment or training without regard to their race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation, or any other classifications protected by law.

8-1.5 APPRENTICES

CONTRACTOR and SUBCONTRACTORS shall comply with Sections 1777.5, 1777.6 and 1777.7 of the California Labor Code and Title 8, California Administrative Code Section 200 et. seq. To ensure compliance and complete understanding of the law regarding apprentices, and specifically the required ratio thereunder, CONTRACTOR and/or SUBCONTRACTORS shall, where some question exists, contact the Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, California, or one of its branch offices prior to commencement of WORK on the CONTRACTOR. Responsibility for compliance with this Section lies with the CONTRACTOR.

It is State policy to encourage the employment and training of apprentices on Public Works Contracts as may be permitted under local apprenticeship standards.

In addition, the COUNTY requires that all bidders on public work projects in excess of Seven Hundred Fifty Thousand Dollars ($750,000.00) to participate in a State of California Division of Apprenticeship Standards approved joint labor and management apprenticeship program.

Proof of compliance with this requirement must be provided at the time the PROPOSAL is submitted.

8-1.6 WORKER'S COMPENSATION

Pursuant to the requirements of Section 1860 of the California Labor Code, CONTRACTOR shall secure the payment of Workers' Compensation to its employees in accordance with the provisions of Section 3700 of the Labor Code. Prior to the commencement of WORK, CONTRACTOR shall sign and file with the ENGINEER a certification in the following form:

> "I am aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of said Code and I will comply with such provisions before commencing the performance of the WORK of this CONTRACT."

Said certification is included in the CONTRACT, and signature and return of the CONTRACT as provided in Section 3-2, "Execution of Contract," shall constitute signing and filing of the said certificate.

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 workers' compensation insurance carrier or that the employer is self-insured, and who is responsible for claims adjustment. The notice shall also include advice as to the injured employee's right to receive medical care, to select or change the treating physician pursuant to the provisions of Labor Code Section 4600, and the right to receive temporary disability indemnity, permanent disability indemnity, vocational rehabilitation services, and death benefits, as appropriate.

CONTRACTOR and SUBCONTRACTORS shall also give every new employee, either at the time the employee is hired or by the end of the first pay period, written notice of the information contained in Labor Code Section 3550.

8-1.7 PUBLIC WORKS CONTRACTOR REGISTRATION

Pursuant to Labor Code sections 1725.5 and 1771.1, the CONTRACTOR and its SUBCONTRACTORS must be registered with the Department of Industrial Relations prior to the execution of a contract to perform public works project. By entering into this CONTRACT, CONTRACTOR represents that it is aware of the registration requirement and is currently registered with the DIR. CONTRACTOR shall maintain a current registration for the duration of the PROJECT. CONTRACTOR shall further include the requirements of Labor Code sections 1725.5 and 1771.1 in any subcontract and ensure that all SUBCONTRACTORS are registered at the time this CONTRACT is entered into and maintain registration for the duration of the PROJECT. Notwithstanding the foregoing, the contractor registration requirements mandated by Labor Code Sections 1725.5 and 1771.1 shall not apply to work performed on a public works

project that is exempt pursuant to the small project exemption specified in Labor Code Sections 1725.5 and 1771.1.

8-1.8 CONTRACTOR'S LICENSING LAWS

Attention is directed to the provisions of Chapter 9 of Division 3, of the Business and Professions Code concerning the licensing of contractors. All BIDDERS and CONTRACTORS shall be licensed in accordance with the laws of the State of California and any BIDDER or CONTRACTOR not so licensed is subject to the penalties imposed by such laws.

The Contractors' State License Board has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four (4) years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within ten (10) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 26000, Sacramento, California 95826.

8-2 PAYMENT OF TAXES

The CONTRACT prices paid for the WORK shall include full compensation for all taxes which the CONTRACTOR is required to pay, whether imposed by Federal, State, or local government, including, without being limited to, State Sales Tax and Federal Excise Tax.

In accordance with Revenue and Taxation Code section 107.6, the CONTRACT DOCUMENTS may create a possessory interest subject to personal property taxation for which CONTRACTOR will be responsible.

8-3 PERMITS AND LICENSES

CONTRACTOR shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the WORK.

The Environmental Quality Act of 1970 (Chap. 1433, Stats. 1970, as amended by Chapter 1154, Stats. 1972), may be applicable to permits, licenses, and other authorizations which the CONTRACTOR must obtain from the COUNTY in connection with performing the WORK of the CONTRACT. The CONTRACTOR shall comply with the provisions of said statutes in obtaining such permits, licenses, and other authorizations and they shall be obtained in sufficient time to prevent delays to the WORK.

In the event that the COUNTY has obtained permits, licenses, or other authorizations, applicable to the WORK, in conformance with the requirements in said Environmental Quality Act of 1970, the CONTRACTOR shall comply with the provisions of said permits, licenses, and other authorizations.

8-4 PATENTS

CONTRACTOR shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on, or incorporated in, the WORK, and agrees to indemnify and save harmless the COUNTY, the BOARD OF SUPERVISORS, the ENGINEER and their duly authorized representatives, from all suits at law or actions of every nature for, or on account of, the use of any patented materials, equipment, devices, or processes.

8-5 SAFETY AND HEALTH PROVISIONS

CONTRACTOR shall conform to all applicable occupational safety and health standards, rules, regulations, and orders established by the State of California. Local emergency phone numbers (police, fire, ambulance, hospital) shall be posted on the job site in a conspicuous location.

8-5.1 TRENCH SAFETY

CONTRACTOR shall comply with all applicable laws, ordinances, and regulations relating to Trench Safety. CONTRACTOR shall at all times maintain suitable barricades, warning devices, trench shoring, bracing, and covers, and other protective measures as deemed appropriate by the ENGINEER, which measures shall provide only the highest suitable level of protection to all workers, inspectors, and the general public. Attention is directed to the provisions of Section 8-6, "Public Convenience," Section 8-7, "Public Safety," and Section 8-9, "Preservation of Property."

CONTRACTOR shall submit to the ENGINEER at the preconstruction meeting, a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from hazards of caving ground during the excavation of any trench or trenches five feet or more in depth. If such plan varies from shoring system standards established by the Construction Safety Orders of the California Code of Regulations, Department of Industrial Relations, the plan shall be prepared by a California registered civil or structural engineer. The plan shall not be less effective than the shoring, bracing, sloping, or other provisions of the Construction Safety Orders, as defined in the California Code of Regulations. CONTRACTOR shall designate in writing the “competent person” as defined in Title 8, California Code of Regulations, who shall be present at the work site each day that trenching/excavation is in progress. The “competent person” shall prepare and provide daily trenching/excavation inspection reports to the ENGINEER. CONTRACTOR shall also submit a copy of its annual California Occupational Safety and Health Administration (Cal/OSHA) trench/excavation permit.

8-5.2 SOUND CONTROL REQUIREMENTS

CONTRACTOR shall comply with all local sound control and noise level rules, regulations, and ordinances which apply to any WORK performed pursuant to the CONTRACT.

Each internal combustion engine used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

8-5.3 WEIGHT LIMITATIONS

Unless expressly permitted in the CONTRACT DOCUMENTS, CONTRACTOR shall not operate construction equipment or vehicles of any kind which, laden or unladen, exceed the maximum weight limits set forth in Division 15 of the Vehicle Code, over completed or existing treated base, surfacing, pavement, or structures in any area within the limits of the PROJECT.

8-6 PUBLIC CONVENIENCE

This Section defines the CONTRACTOR's responsibility with regard to convenience of the public and public traffic in connection with construction operations.

CONTRACTOR's attention is directed to Section 8-7, "Public Safety" for provisions relating to the CONTRACTOR's responsibility for the safety of the public. The requirements in said Section 8-7 are in addition to the requirements of this Section 8-6, and CONTRACTOR will not be relieved of any responsibilities as set forth in said Section 8-7 by reason of conformance with any of the provisions in this Section 8-6.

In the event of a suspension of the WORK, attention is directed to Section 9-3, "Temporary Suspension of Work."

CONTRACTOR shall conduct operations so as to offer the least possible obstruction and inconvenience to the public. CONTRACTOR shall have under construction no greater length or amount of WORK than can be prosecuted properly with due regard to the rights of the public.

Unless otherwise provided in the CONTRACT DOCUMENTS, all public and landfill traffic shall be permitted to pass through the WORK with as little inconvenience and delay as possible. Where possible, such traffic shall be routed on new or existing paved surfaces.

Spillage resulting from hauling operations along or across any public traveled way shall be removed immediately by CONTRACTOR at CONTRACTOR's expense.

Existing traffic signal and street lighting systems shall be kept in operation for the benefit of the traveling public during progress of the WORK. Other forces will continue routine maintenance of existing systems.

Construction operations shall be conducted in such a manner so as to cause as little inconvenience as possible to abutting property owners.

Convenient access to driveways, houses, and buildings along the line of WORK shall be maintained. When the abutting property owner's access across the right-of-way line is to be

eliminated, or to be replaced under the CONTRACT by other access facilities, the existing access shall not be closed until the replacement access facilities are usable.

Water and dust palliative shall be applied if ordered by the ENGINEER for the alleviation or prevention of dust nuisance. No separate payment will be made for any WORK performed, or material used, to control dust resulting from CONTRACTOR's performance of the WORK, or caused by public traffic, either inside or outside the right-of-way. Full compensation for such dust control will be considered as included in the prices paid for the various items of WORK involved.

In order to expedite the passage of public traffic through or around the WORK, and where ordered by the ENGINEER, CONTRACTOR shall install and maintain in good condition, signs, lights, flares, temporary railing (Type K), barricades, and other facilities for the sole convenience and direction of public traffic. Also, where directed by the ENGINEER, CONTRACTOR shall furnish competent flaggers whose sole duties shall consist of directing the movement of public traffic through or around the WORK.

Should CONTRACTOR fail to install or maintain traffic control devices required by the ENGINEER or the CONTRACT DOCUMENTS, the ENGINEER may cause such installation or maintenance by other forces and shall deduct the cost thereof from money due, or to become due, CONTRACTOR under the CONTRACT.

Whenever a section of surfacing or pavement has been completed, CONTRACTOR shall open it to use by public traffic if the ENGINEER so orders, or may open it to use by public traffic if the ENGINEER so consents. In either case, CONTRACTOR will not be allowed any compensation due to any delay, hindrance, or inconvenience to operations caused by such public traffic, but will thereupon be relieved of responsibility for damage to the WORK caused by public traffic within the limits of such use. CONTRACTOR will not be relieved of cleanup and finishing operations, or of any other responsibility under the CONTRACT.

Except as otherwise provided in this Section 8-6 or in the CONTRACT DOCUMENTS, full compensation for conforming to the requirements in this Section 8-6 and in the CONTRACT DOCUMENTS shall be considered as included in the prices paid for the various CONTRACT items of WORK, and no additional compensation will be allowed therefor.

8-7 PUBLIC SAFETY

It is CONTRACTOR's responsibility to provide for the safety of traffic and the public during construction.

CONTRACTOR's attention is directed to Section 8-10, "Responsibility for Damage." Attention is also directed to Section 8-6, "Public Convenience," for provisions relating to the CONTRACTOR's responsibility for providing for the convenience of the public in connection with operations required to complete WORK under the CONTRACT.

When CONTRACTOR's operations create a condition hazardous to traffic or to the public, CONTRACTOR shall furnish, erect, and maintain such fences, temporary railing (Type K), barricades, lights, signs, and other devices, and take such other protective measures as are necessary to prevent accidents or damage or injury to the public. CONTRACTOR shall also furnish such flaggers as are necessary to give adequate warning to traffic or to the public of any dangerous conditions to be encountered. All such measures shall be performed at CONTRACTOR's sole expense and without cost to the COUNTY.

Signs, lights, flags, and other warning and safety devices and their use shall conform to the requirements set forth in the current "MANUAL OF TRAFFIC CONTROLS - Warning Signs, Lights and Devices for Use in Performance of Work Upon Highways," published by the Department of Transportation, State of California.

No material or equipment shall be stored where it will interfere with the free and safe passage of public traffic. At the end of each day's WORK and at other times when construction operations are suspended for any reason, CONTRACTOR shall remove all equipment and other obstructions from that portion of the roadway for use by public traffic

Should CONTRACTOR appear to be neglectful or negligent in furnishing warning devices and taking protective measures as above provided, the ENGINEER may direct attention to the existence of a hazard, and the necessary warning devices shall by furnished and installed, and protective measures taken by CONTRACTOR at CONTRACTOR's expense. Should the ENGINEER point out the inadequacy of warning devices and protective measures, such action on the part of the ENGINEER shall not relieve CONTRACTOR from responsibility for public safety or abrogate obligation to furnish and pay for these devices and measures.

Except as otherwise provided in the CONTRACT DOCUMENTS, full compensation for conforming to all of the provisions in this Section 8-7, and in the CONTRACT DOCUMENTS, shall be considered as included in the prices paid for the various CONTRACT items of WORK, and no additional compensation will be allowed therefor.

8-8 USE OF EXPLOSIVES

The use of explosives is not allowed unless otherwise provided in the CONTRACT DOCUMENTS.

8-9 PRESERVATION OF PROPERTY

CONTRACTOR's attention is directed to Section 8-10, "Responsibility for Damage." Due care shall be exercised to avoid injury to existing highway improvements or facilities, utility facilities, adjacent property, and roadside trees, shrubs, and other plants that are not to be removed.

Trees, shrubs, and other plants that are not to be removed, pole lines, fences, signs, markers and monuments, buildings and structures, conduits, pipelines under or above ground, sewer and water lines, all street facilities, and any other improvements or facilities within or adjacent

to the WORK, shall be protected from injury or damage. If ordered by the ENGINEER, CONTRACTOR shall provide and install suitable safeguards, approved by the ENGINEER, to protect such objects from injury or damage. If such objects are injured or damaged by reason of CONTRACTOR's operations, they shall be replaced or restored at CONTRACTOR's expense. The facilities shall be replaced or restored to a condition as good as when CONTRACTOR entered upon the WORK, or as good as required by the SPECIFICATIONS accompanying the CONTRACT, if any such objects are a part of the WORK being performed under the CONTRACT. The ENGINEER may make or cause to be made such temporary repairs as are necessary to restore to service any damaged highway facility. The cost of such repairs shall be borne by CONTRACTOR and may be deducted from any money due or, to become due, CONTRACTOR under the CONTRACT.

The CONTRACTOR's attention is also directed to the site plan which indicates the locations of existing observation wells, extraction wells, survey monuments, paved roads, groundwater monitoring wells on the project site, LCRS clean-outs, and leachate pipes, which are to be protected from damage. Existing roads used as haul roads shall be returned to their original condition, as approved by the ENGINEER.

The CONTRACTOR shall be responsible for the repair or replacement of any existing facilities and equipment damaged by the CONTRACTOR's personnel, equipment, sub-contractors, or material suppliers.

The CONTRACTOR is advised that the construction of this project may entail working adjacent to buried wastes and landfill leachate from the adjacent modules. As buried organic materials decompose anaerobically, they generate landfill gas (LFG). This LFG (or biogas) normally consists of about 45 percent carbon dioxide (CO_2), 55 percent methane (CH_4), and other gases dependent on the composition of the buried materials. Occasionally hydrogen sulfide (H_2S) or other toxic gases have been encountered at some landfills, even though the sites were not classified as hazardous waste disposal sites.

The landfill is permitted by the state and operated as a Class III landfill which allows for the disposal of "nonhazardous solid waste" as defined in Title 23 of the California Administrative Code. The leachate holding ponds are permitted by the state and operated as Class II surface impoundments which allows for the disposal of "liquid designated waste" as defined in Title 27 of the California Administrative Code.

Notwithstanding the above, the COUNTY cannot guarantee that toxic or hazardous materials or vapors shall not be encountered by the CONTRACTOR during the performance of this project.

CONTRACTOR's attention is also directed to the possible existence of underground main or trunk line facilities not indicated on the PLANS or in the TECHNICAL PROVISIONS, and to the possibility that underground main or trunk lines may be in a location different from that which is indicated on the PLANS or in the TECHNICAL PROVISIONS. CONTRACTOR shall ascertain the exact location of underground main or trunk lines whose presence is indicated on the PLANS or

in the TECHNICAL PROVISIONS, and the location of their service laterals or other appurtenances, and of existing service laterals or appurtenances of any other underground facilities which can be inferred from the presence of visible facilities such as buildings, meters, and junction boxes. This determination shall be made prior to doing WORK that may damage any of such facilities or interfere with their service. The locating of utilities shall be in conformance with Government Code Section 4216 except for the COUNTY's utilities located on the COUNTY's property and not on public right-of-way.

CONTRACTOR shall immediately notify the ENGINEER of any delays to operations which are a direct result of underground main or trunk line facilities which were not indicated on the Plans or in the TECHNICAL PROVISIONS, or were located in a position substantially different from that indicated on the PLANS or in the TECHNICAL PROVISIONS. Such delays will be considered right-of-way delays within the meaning of Section 9-7, "Right-of-Way Delays," and compensation for such delay will be determined in accordance with said Section 9-7. CONTRACTOR shall be entitled to no other compensation for any such delay.

Except as provided above, full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the WORK involved in protecting or repairing property as specified in this Section 8-9, shall be considered as included in the prices paid for the various CONTRACT items of WORK and no additional compensation will be allowed therefor.

8-10 RESPONSIBILITY FOR DAMAGE

CONTRACTOR shall defend, indemnify, and save harmless the COUNTY and all its officers, agents, and employees from any and all claims, demands, damages, costs, expenses or liability occasioned by the performance or attempted performance of the provisions hereof, or in any way arising out of the CONTRACT, including, but not limited to, inverse condemnation, equitable relief, any wrongful act, or any negligent act or omission to act on the part of CONTRACTOR or any of its agents, employees, independent contractors or SUBCONTRACTORS; provided, further, that the foregoing shall apply to any wrongful acts, or any actively or passively negligent acts or omissions to act, committed jointly or concurrently by CONTRACTOR, CONTRACTOR's agents, employees, or independent contractors or SUBCONTRACTORS, and the COUNTY, its agents, employees, or independent contractors.

Such indemnity obligation expressly extends to, and includes, any and all claims, demands, damages, costs, expenses, or liability occasioned as a result of damages to adjacent property caused by the conduct of the WORK.

Such indemnity obligation expressly extends to and includes any and all claims, demands, damages, costs, expenses, or liability occasioned as a result of the violation by the CONTRACTOR, the CONTRACTOR's agents, employees, or independent contractors or

SUBCONTRACTORS, of any provisions of Federal or State law, including, but not limited to fines or penalties.

Such indemnity obligation also expressly extends to and incudes any claims, demands, damages, costs, expenses, or liability occasioned by injury to or death of any person, or any property damage to property owned by any person while on or about the premises of the WORK, or as a result of the WORK, whether such persons are 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 the foregoing indemnity provisions shall be construed to require the CONTRACTOR to indemnify the COUNTY in contravention of Section 2782 of the Civil Code.

In providing any defense under this Section, CONTRACTOR shall use counsel reasonably acceptable to the COUNTY.

8-11 INSURANCE REQUIREMENTS

CONTRACTOR shall obtain at CONTRACTOR's sole cost and expense, all insurance required by CONTRACT AGREEMENT. Certificates of insurance and copies of the insurance policies shall be delivered to the COUNTY prior to execution of the CONTRACT and before any WORK is commenced. No payment will be made to the CONTRACTOR unless current insurance certificates are on file with the COUNTY at the time of the payment.

CONTRACTOR shall include all SUBCONTRACTORS as insured under its policies or shall furnish separate certificates and endorsements for each SUBCONTRACTOR. All coverages for SUBCONTRACTORS shall be subject to all the requirements stated herein.

8-12 LEGAL ACTIONS AGAINST THE COUNTY

In the event litigation is brought against the COUNTY concerning the compliance of the COUNTY with State or Federal laws, rules or regulations, or other applicable rules, regulations, or ordinances, the provisions of this Section shall apply.

A. If, pursuant to court order, the COUNTY prohibits CONTRACTOR from performing all or any portion of the WORK, the delay will be considered a delay within the meaning of Section 9-7, "Right-of-Way Delays," unless the CONTRACT is terminated as hereinafter provided.

B. If, pursuant to court order (other than an order to show cause) the COUNTY is prohibited from requiring CONTRACTOR to perform all or any portion of the WORK, the COUNTY may, if it so elects, eliminate the enjoined WORK pursuant to Section 4-3, "Changes," or terminate the CONTRACT.

C. If the final judgment in the action prohibits the COUNTY from requiring CONTRACTOR to perform all or any portion of the WORK, the COUNTY will either eliminate the enjoined WORK pursuant to Section 4-3, "Changes," or terminate the CONTRACT.

D. If the CONTRACT is to be terminated, the termination and the determination of the total compensation payable to the CONTRACTOR, shall be governed by the provisions of Section 9-8, "Termination of Contract."

8-13 DISPOSAL OF MATERIAL

CONTRACTOR may, at his option, dispose of any waste materials generated from this project, that are regularly accepted at the landfill, except hazardous materials, on site at a location directed by ENGINEER. All disposed materials shall be weighed before disposal at the YCCL scale house. CONTRACTOR must transport the materials in a vehicle approved by ENGINEER. The normal fee charged for disposal of said materials shall be waived by the COUNTY.

Full compensation for all costs involved in disposing of materials as specified in this Section 8-13, including all costs of hauling, shall be considered as included in the price paid for the CONTRACT item of WORK involving such materials and no additional compensation will be allowed therefor.

8-14 COOPERATION

Should construction be under way by other forces or by other contractors within or adjacent to the limits of the WORK specified, or should work of any other nature be under way by other forces within or adjacent to said limits, CONTRACTOR shall cooperate with all such other contractors or other forces to the end that any delay or hindrance to their work will be avoided. The right is reserved to perform other or additional work at or near the site (including material sources) at any time, by the use of other forces.

CONTRACTOR is advised that the COUNTY has ongoing landfilling and material recycling operations. The CONTRACTOR is fully responsible for coordinating construction activities with other on-site operations. No provisions for schedule or cost adjustments shall be provided due to alleged delays or other alleged impacts arising from on-site operations activities.

The authorized representatives of the following agencies shall also have the right of access to inspect the WORK covered by these CONTRACT DOCUMENTS during the performance of this CONTRACT:

1. Regional Water Quality Control Board, Central Valley Region
2. Yolo/Solano County Air Pollution Control District
3. California Department of Resources, Recycling and Recovery
4. Yolo County Environmental Health Department
5. Other local, state, and federal agencies

These inspections shall be performed in the presence of the COUNTY. Reasonable facilities for the proper handling and inspection of the materials and WORK shall be furnished by the CONTRACTOR.

8-15 RELIEF FROM MAINTENANCE AND RESPONSIBILITY

Upon the request of CONTRACTOR, the ENGINEER may relieve CONTRACTOR of the duty of maintaining and protecting certain portions of the WORK which have been completed in all respects, in accordance with the requirements of the CONTRACT, and to the satisfaction of the ENGINEER, and thereafter, except with consent, CONTRACTOR will not be required to do further WORK thereon. In addition, such action by the ENGINEER will relieve CONTRACTOR of responsibility for injury or damage to said completed portions of the WORK resulting from use by public traffic, or from the action of the elements, or from any other cause but not from injury or damage resulting from CONTRACTOR's own operations or negligence. However, nothing in this Section 8-15 providing for relief from maintenance and responsibility, will be construed as relieving CONTRACTOR of full responsibility for making good defective WORK or materials found at any time before the formal written acceptance of the entire CONTRACT by the COUNTY or applicable warranty period pursuant to the CONTRACT or California law.

8-16 CONTRACTOR'S RESPONSIBILITY FOR THE WORK AND MATERIALS

Until the acceptance of the CONTRACT by the BOARD OF SUPERVISORS, CONTRACTOR shall have the charge and care of the WORK and of the materials to be used therein (including materials for which partial payment has been made, or materials which have been furnished by the COUNTY), and shall bear the risk of injury, loss, or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the WORK, except as provided in Section 8-6, "Public Convenience," and Section 8-15, "Relief from Maintenance and Responsibility."

CONTRACTOR shall rebuild, repair, restore, and make good all injuries, losses, or damages to any portion of the WORK or the materials occasioned by any cause before its completion and acceptance, and shall bear the expense thereof. Where necessary to protect the WORK or materials from damage, the CONTRACTOR shall provide suitable drainage of any roadway and erect such temporary structures as are necessary to protect the WORK or materials from damage at no expense to the COUNTY. The suspension of the WORK from any cause whatever shall not relieve CONTRACTOR of responsibility for the WORK and materials as herein specified.

8-17 PROPERTY RIGHTS IN MATERIALS

Nothing in the CONTRACT shall be construed as vesting in CONTRACTOR any right of property in the materials used after they have been attached or affixed to the WORK or soil. All such material shall become the property of the COUNTY.

8-18 PERSONAL LIABILITY

Neither the BOARD OF SUPERVISORS, DIRECTOR, ENGINEER, nor any other officer or authorized employee of the COUNTY, shall be personally responsible for any liability arising under, or by virtue of, the CONTRACT.

SECTION 9 - PROSECUTION AND PROGRESS

9-1 BEGINNING OF WORK

After the CONTRACT has been executed, the COUNTY will issue to CONTRACTOR a written NOTICE TO PROCEED stating the first WORKING DAY of the CONTRACT. CONTRACTOR shall diligently prosecute the CONTRACT to completion within the specified time limit.

Should CONTRACTOR begin WORK in advance of receiving notice that the CONTRACT has been approved as above provided, any WORK performed in advance of the said date of approval shall be considered as having been done at CONTRACTOR's own risk and as a volunteer unless said CONTRACT is so approved.

The delivery of the CONTRACT, BONDS, and approved insurance to the COUNTY, for execution and approval, properly executed on behalf of the CONTRACTOR and surety shall constitute CONTRACTOR's authority to enter upon the site of the WORK and to begin operations, subject to assuming the risk of the disapproval of the CONTRACT, as above provided, and subject also to the following:

A. Notice in writing of CONTRACTOR's intention to start WORK prior to approval, specifying the intended start date, shall be given to the COUNTY at least twenty-four (24) hours in advance; and

B. CONTRACTOR shall, on commencing operations, take all precautions required for public safety and shall observe all provisions of the CONTRACT; and

C. All WORK performed according to the CONTRACT prior to its approval under the authorization hereof, will, when the CONTRACT is approved, be considered authorized WORK and will be paid for as provided in the CONTRACT.

The CONTRACTOR shall be required to commence WORK as directed by in Section 11-5 “Prosecution and Progress”.

9-2 PROGRESS SCHEDULE

CONTRACTOR shall submit to the ENGINEER a practicable critical path method progress schedule within ten (10) WORKING DAYS of the NOTICE TO PROCEED. Additionally, an updated schedule shall be provided by the CONTRACTOR at each weekly progress meeting and within ten (10) WORKING DAYS of the ENGINEER's written request at any other time.

The schedule shall show the order in which the CONTRACTOR proposes to carry out the WORK, the dates on which all salient features of the WORK will be started (including procurement of materials, plant, and equipment), and the contemplated dates for completing the said salient features, and indicating the approximate percentage of WORK scheduled for completion at any

time. The form, degree of detail, and frequency of updating the schedule shall be as instructed by the ENGINEER.

The progress schedule submitted shall be consistent in all respects with the time and order of WORK requirements of the CONTRACT. The order of the WORK shall be in a logical sequence submitted for approval by the ENGINEER prior to the start of WORK.

Project schedules will include at a minimum, the following:

1. Contract approval date
2. Procurement of special order items, i.e. control panels, pumps, etc…
3. Planned and actual start and completion date of each work activity
4. Each bid item will be considered a work activity
5. Subtasks associated with each work activity, i.e. Survey, watering, track walking, etc.
6. Final cleanup

Project schedules that are accepted by the ENGINEER, will be paid for in the progress pay estimate after the scheduled week, at the CONTRACT unit price per the bid schedule. When no bid item is provided for a progress schedule, payment for progress schedule costs shall be deemed to be included in the other bid items.

Subsequent to the time that submittal of a progress schedule is required in accordance with these SPECIFICATIONS, no progress payments will be made for any WORK until a satisfactory schedule has been submitted to the ENGINEER.

Despite the filing of a progress schedule, CONTRACTOR shall be governed by the direction of the ENGINEER in respect to specific programming when, in the judgment of the ENGINEER, it becomes necessary to accelerate the WORK or any part thereof, or cease WORK at any particular point and concentrate his forces at such other point or points, to the intent that all avoidable delays may be obviated.

9-3 TEMPORARY SUSPENSION OF WORK

The ENGINEER shall have the authority to suspend the WORK wholly or in part, for such period as deemed necessary, due to unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the WORK, or for such time as deemed necessary due to the failure on the part of the CONTRACTOR to carry out orders given, or to perform any provision of the CONTRACT. CONTRACTOR shall immediately comply with the written order of the ENGINEER to suspend the WORK wholly or in part. The suspended WORK shall be resumed when conditions are favorable and methods are corrected, as ordered or approved in writing by the ENGINEER.

In the event that a suspension of WORK is ordered as provided above, and should such suspension be ordered because CONTRACTOR failed to carry out orders or to perform any provision of the CONTRACT; or because weather conditions are unsuitable for performing any item or items of WORK which the ENGINEER judges could have been performed prior to such unsuitable weather had CONTRACTOR diligently prosecuted the WORK when weather was suitable; CONTRACTOR, at CONTRACTOR's expense, shall do all the WORK necessary to provide a safe, smooth, and unobstructed passageway through the construction area for use by public traffic, landfill customers, and COUNTY employees and contractors during the period of such suspension, as provided in Sections 8-6, "Public Convenience," and 8-7, "Public Safety," and as specified in the TECHNICAL PROVISIONS for the WORK. In the event that CONTRACTOR fails to perform the WORK above specified, the COUNTY will perform such WORK and the cost thereof will be deducted from money due or to become due CONTRACTOR.

In the event of a suspension of WORK under any of the conditions set forth in this Section 9-3, such suspension of WORK shall not relieve the CONTRACTOR of responsibilities specified in Section 8, "Legal Relations and Responsibility."

9-4 TIME OF COMPLETION

The CONTRACTOR shall diligently prosecute the WORK required under the CONTRACT DOCUMENTS to completion within the number of WORKING DAYS set forth in Section 11-5, “Prosecution and Progress” after the commencement of the WORK.

If any portion of a day is a legal holiday, the entire day will be considered as a non-WORKING DAY within the meaning of this Section 9-4.

Should CONTRACTOR prepare to begin WORK at the regular starting time of any day on which inclement weather, or the conditions resulting from the weather, or the condition of the WORK, prevents the WORK from beginning at the usual starting time, and the crew is dismissed as a result thereof, and CONTRACTOR does not proceed with at least Seventy-Five Percent (75%) of the normal labor and equipment force engaged in the current controlling operation, or operations, for at least Sixty Percent (60%) of the total daily time being currently spent on the controlling operation or operations, the CONTRACTOR will not be charged for a WORKING DAY whether or not conditions should change thereafter during said day, and the major portion of the day could be considered to be suitable for such construction operations.

The current controlling operation or operations are to be construed to include any feature of the WORK considered at the time by the ENGINEER and the CONTRACTOR, which, if delayed, will delay the time of completion of the CONTRACT.

Determination that a day is a non-WORKING DAY by reason of inclement weather or conditions resulting immediately therefrom shall be made and agreed upon during such day by conference between the ENGINEER and CONTRACTOR. In the event of failure to agree, CONTRACTOR will be allowed fifteen (15) DAYS from the issuance of the weekly statement of WORKING DAYS in

which to file a written protest setting forth in what respects CONTRACTOR differs from the ENGINEER; otherwise, the decision of the ENGINEER shall be deemed to have been accepted by CONTRACTOR as correct. The ENGINEER will furnish CONTRACTOR a weekly statement showing the number of WORKING DAYS charged to the CONTRACT for the preceding week, the number of WORKING DAYS of time extensions being considered or approved, the number of WORKING DAYS originally specified for the completion of the CONTRACT, and the number of WORKING DAYS remaining to complete the CONTRACT and the extended date for completion thereof, except when WORKING DAYS are not being charged in accordance with the provisions in Section 9-3, "Temporary Suspension of Work."

The COUNTY is under no obligation to consider early completion of the PROJECT and CONTRACTOR shall not, under any circumstances, receive additional compensation from the COUNTY (including but not limited to indirect, general, administrative or other forms of overhead costs) for the period between the time of earlier completion proposed by the CONTRACTOR and the CONTRACT completion date.

9-5 LIQUIDATED DAMAGES

If the WORK required under the CONTRACT DOCUMENTS is not finished or completed within the CONTRACT TIME, the CONTRACTOR shall pay to the COUNTY, as fixed and liquidated damages and not as penalty, the sum set forth in Section 11-5, “Prosecution and Progress” per day for each and every DAY of delay in finishing the WORK in excess of the numbers of days prescribed. In addition to the above described liquidated damages, CONTRACTOR agrees to reimburse COUNTY for any fines or penalties issued by regulatory agencies should the CONTRACTOR fail to complete the WORK within the CONTRACT TIME.

If the WORK required under this CONTRACT is not finished or completed within the CONTRACT TIME, CONTRACTOR acknowledges and admits that damage will be sustained by the COUNTY. It is also agreed that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the COUNTY will sustain in the event of and by reason of such delay. It is therefore agreed by the parties of this CONTRACT, that CONTRACTOR will pay to the COUNTY, as fixed and liquidated damages and not as penalty, the sum set forth in Section 11-5, “Prosecution and Progress” per day for each and every DAY of delay in finishing the WORK in excess of the CONTRACT TIME. CONTRACTOR further agrees that the COUNTY may deduct the amount thereof from any money due or that may become due CONTRACTOR under the CONTRACT. Both the CONTRACTOR and the CONTRACTOR's surety shall be liable for the total amount of liquidated damages.

It is further agreed that if the WORK called for under the CONTRACT is not finished and completed in all parts and requirements within the CONTRACT TIME, the ENGINEER shall have the right to increase the number of working days or not, as they may deem best to serve the interest of the COUNTY.

CONTRACTOR's entitlement to an extension of the CONTRACT TIME is limited to a COUNTY-caused extension of the critical path, reduced by the CONTRACTOR's concurrent delays, and established by a proper time impact analysis. CONTRACTOR shall not be charged liquidated damages because of any delays in completion of the WORK due to unforeseeable causes beyond the control and without the fault or negligence of CONTRACTOR (or its SUBCONTRACTORS or suppliers). COUNTY shall ascertain the facts and extent of delay and grant extension of time for completing the WORK when, in its judgment, the facts justify such an extension. No time extension shall be allowed unless, and then only to the extent that, COUNTY-caused delay extends the critical path beyond the previously approved CONTRACT TIME.

CONTRACTOR will be granted an extension of the CONTRACT TIME for the completion of WORK caused by: acts of God or of the public enemy, fire, floods, tidal waves, earthquakes, epidemics, quarantine restrictions, strikes, labor disputes, shortage of materials, freight embargoes or other causes not the fault of and beyond the control of the COUNTY and CONTRACTOR when the WORK stopped is on the critical path; provided, that CONTRACTOR shall notify the ENGINEER in writing of the causes of delay within fifteen (15) DAYS from the beginning of any such delay. The ENGINEER shall ascertain the facts and the extent of the delay, and his findings thereon shall be final and conclusive. Such a non-compensable adjustment shall be CONTRACTOR's sole and exclusive remedy for such delays.

No extension of the CONTRACT TIME will be granted for a delay caused by a shortage of materials unless CONTRACTOR furnishes to the ENGINEER documentary proof that every effort has been made to obtain such materials, from all known sources within reasonable reach of the WORK, in a diligent and timely manner, and further proof in the form of supplementary progress schedules, as required in Section 9-2, "Progress Schedule," that the inability to obtain such materials when originally planned, did in fact cause a delay in final completion of the entire WORK, which delay could not be compensated for by revising the sequence of the CONTRACTOR's operations. The term "shortage of materials," as used in this Section, shall apply only to materials, articles, parts, or equipment which are standard items and are to be incorporated in the WORK. The term "shortage of materials," shall not apply to materials, parts, articles, or equipment which are processed, made, constructed, fabricated, or manufactured to meet the specific requirements of the CONTRACT. Only the physical shortage of material will be considered under these provisions as a cause for extension of the CONTRACT TIME. Delays in obtaining materials due to priority in filling orders will not constitute a shortage of materials. The ENGINEER shall have exclusive authority to determine if the shortage of materials constitutes a delay.

Except for the additional compensation provided for in Section 9-7, "Right-of-Way Delays," and except as provided in Public Contract Code Section 7102, CONTRACTOR shall have no claim for damage or compensation for any delay or hindrance. In no case shall the COUNTY be liable for

any costs which are borne by the CONTRACTOR in the regular course of business, including, but not limited to, home office overhead and other ongoing costs.

It is the intent of the above provisions that CONTRACTOR shall not be relieved of liability for liquidated damages for any period of delay in completion of the WORK in excess of that expressly provided for in this Section 9-5.

Payment by the COUNTY of any progress payments, after the specified date of completion, shall not constitute a waiver by the COUNTY of its right to claim liquidated damages in accordance with this Section.

CONTRACTOR shall not be entitled to any extension of time unless CONTRACTOR properly notices the delay and adjustment to compensation and requests a CONTRACT CHANGE ORDER in accordance with these SPECIFICATIONS. CONTRACTOR's failure to timely and fully comply with the change order procedures shall constitute a waiver of CONTRACTOR's right to a time extension.

9-6 TERMINATION OF CONTROL

The CONTRACT may be cancelled by the COUNTY without liability for damage, when in the opinion of the COUNTY, CONTRACTOR is not complying in good faith, has become insolvent, or has assigned or subcontracted any part of the WORK without the COUNTY's consent. In the event of such cancellation, CONTRACTOR will be paid the actual amount due based on unit prices or lump sums bid for the quantity of WORK completed at the time of cancellation, less damages caused to the COUNTY by acts of CONTRACTOR causing the cancellation. CONTRACTOR, in having tendered a bid, shall be deemed to have waived any and all claims for damages because of cancellation of the CONTRACT for any such reason. If the COUNTY declares the CONTRACT cancelled for any of the above reasons, written notice to that effect shall be served upon the Surety. The Surety shall, within five (5) days, assume control and perform the WORK as successor to CONTRACTOR.

If CONTRACTOR fails to begin delivery of material and equipment, to commence WORK within the time specified, to maintain an acceptable rate of delivery of material, to execute the WORK in the manner and at such locations as specified, or fails to maintain a work program which will insure the COUNTY's interest, or, if CONTRACTOR is not carrying out the intent of the CONTRACT, the ENGINEER's written notice may be served upon CONTRACTOR and the Surety on its Faithful Performance Bond, demanding satisfactory compliance with the CONTRACT.

If CONTRACTOR or its Surety does not comply with such notice within five (5) days after receiving it, or after starting to comply, fails to continue, the COUNTY may exclude it from the premises and take possession of all material and equipment, and complete the WORK by COUNTY forces or by letting the unfinished WORK to another CONTRACTOR, or by a combination of such methods. In any event, the cost of completing the WORK shall be charged against CONTRACTOR and its Surety, and may be deducted from any money due or becoming

due from the COUNTY. If the sums under the CONTRACT are insufficient for completion, CONTRACTOR or Surety shall pay to the COUNTY within five (5) days after completion, all costs in excess of the CONTRACT PRICE.

If the Surety assumes any part of the WORK, it shall take CONTRACTOR's place in all respects for that part, and shall be paid by the COUNTY for all WORK performed by it in accordance with the CONTRACT. If the Surety assumes the entire CONTRACT, all money due to the CONTRACTOR at the time of its default shall be payable to the Surety as the WORK progresses, subject to the terms of the CONTRACT.

The provisions of this Section shall be in addition to all other rights and remedies available to the COUNTY under law. The COUNTY has the full right to pursue all of its legal and equitable remedies in regard to breach of this CONTRACT.

9-7 RIGHT-OF-WAY DELAYS

If, through an act of commission or omission by the COUNTY, CONTRACTOR sustains loss which could not have been avoided by the judicious handling of forces, equipment, and plant, CONTRACTOR shall be entitled to reasonable compensation for such part of CONTRACTOR's actual loss, which in the opinion of the ENGINEER, was unavoidable.

Actual loss shall be understood to include no items of expense other than idle time of equipment and necessary payments for idle time of workers.

Compensation for idle time of equipment will be determined in the same manner as determinations are made for equipment used in the performance of EXTRA WORK paid for on a force account basis, as provided in Section 4-4.1.1, "Labor," and no markup will be added in either case for overhead and profit.

9-8 TERMINATION OF CONTRACT

The CONTRACT may be terminated by the ENGINEER when termination is authorized by Section 8-12, "Legal Actions Against the COUNTY," or by other provisions of the CONTRACT which authorize termination. The COUNTY also reserves the right to terminate the CONTRACT at any time upon a determination by the COUNTY that termination of the CONTRACT is in the best interest of the COUNTY.

If the ENGINEER elects to terminate the CONTRACT, the termination of the CONTRACT and the total compensation payable to the CONTRACT shall be governed by the following:

9-8.1 The ENGINEER will issue contractor a written notice signed by the ENGINEER, specifying that the CONTRACT is to be terminated. Upon receipt of said written notice, CONTRACTOR will be relieved of further responsibility for damage to the WORK (excluding materials) as specified in Section 8-16, "CONTRACTOR's

Responsibility for the Work and Materials," and, except as otherwise directed in writing by the ENGINEER, CONTRACTOR shall:

9-8.1.1 Stop all WORK under the CONTRACT except that specifically directed to be completed prior to acceptance.

9-8.1.2 Perform work the ENGINEER deems necessary to secure the PROJECT for termination.

9-8.1.3 Remove equipment and plant from the site of the WORK.

9-8.1.4 Take such action as is necessary to protect materials from damage.

9-8.1.5 Notify all subcontractors and suppliers that the CONTRACT is being terminated and that their contracts or orders are not to be further performed, unless otherwise authorized in writing by the ENGINEER.

9-8.1.6 Provide the ENGINEER with an inventory list of all materials previously produced, purchased, or ordered from suppliers for use in the WORK, and not yet used in the WORK, including its storage location, and such other information as the ENGINEER may request.

9-8.1.7 Dispose of materials not yet used in the WORK as directed by the ENGINEER. It shall be CONTRACTOR's responsibility to provide the COUNTY with good title to all materials purchased by the COUNTY hereunder, including materials for which partial payment has been made as provided in Section 10-7, "Partial Payments," and to provide bills of sale or other documents of title for such materials.

9-8.1.8 Subject to the prior written approval of the ENGINEER, settle all outstanding liabilities and all claims arising out of subcontracts or orders for materials terminated hereunder. To the extent directed by the ENGINEER, CONTRACTOR shall assign to the COUNTY all the right, title and interest of CONTRACTOR under SUBCONTRACTS or orders for materials terminated hereunder.

9-8.1.9 Furnish the ENGINEER with the documentation required to be furnished by CONTRACTOR under the provisions of the CONTRACT including all documentation required under the Federal or State requirements included in the CONTRACT, for projects for which Federal or State funds are involved.

9-8.1.10 Take such other actions as the ENGINEER may direct.

9-8.2 Acceptance of the CONTRACT as hereinafter specified shall not relieve CONTRACTOR of responsibility for damage to materials. CONTRACTOR shall continue to be responsible for damage to materials after issuance of the Notice of Termination, except as follows:

9-8.2.1 CONTRACTOR's responsibility for damage to materials for which partial payment has been made as provided in Section 10-7, "Partial Payments," and for unused

materials furnished by the COUNTY for use in the WORK, shall terminate when the ENGINEER certifies that such materials have been stored in the manner and at the desired locations as directed.

9-8.2.2 CONTRACTOR's responsibility for damage to materials purchased by the COUNTY, subsequent to the issuance of the notice that the CONTRACT is to be terminated, shall terminate when title and delivery of such materials has been taken by the COUNTY.

9-8.2.3 After determining that CONTRACTOR has completed the WORK under the CONTRACT, which WORK was directed to be completed prior to termination, and such other WORK as may have been so ordered to secure the project for termination, the ENGINEER will recommend that the COUNTY formally accept the CONTRACT. Immediately upon and after such acceptance by the COUNTY, CONTRACTOR will not be required to perform any further work thereon and shall be relieved of any contractual responsibilities for injury to persons or property which occurs after the formal acceptance of the project by the COUNTY.

9-8.3 Termination of the CONTRACT shall not relieve the Surety of its obligation for any just claims arising out of the WORK performed.

9-8.4 The total compensation to be paid to CONTRACTOR shall be determined by the ENGINEER on the basis of the following:

9-8.4.1 The reasonable cost to CONTRACTOR, without profit, for all WORK performed under the CONTRACT, including mobilization, demobilization, and WORK performed to secure the project for termination. In determining the reasonable cost, deductions will be made for the cost of materials to be retained by CONTRACTOR, amounts realized by the sale of materials, and for other appropriate credits against the cost of the WORK. Reasonable cost will include a reasonable allowance for project overhead and general administrative overhead not to exceed a total of seven (7) percent of direct costs of such WORK.

When, in the opinion of the ENGINEER, the cost of a CONTRACT item of WORK is excessively high due to costs incurred to remedy or replace defective or rejected WORK, the reasonable cost to be allowed will be the estimated reasonable cost of performing such WORK in compliance with the requirements of the PLANS and SPECIFICATIONS. The excessive actual cost shall be disallowed.

9-8.4.2 A reasonable allowance for profit on the cost of the WORK performed as determined under Subsection (1), provided CONTRACTOR establishes, to the satisfaction of the ENGINEER, that it is reasonably probable that CONTRACTOR would have made a profit, had the CONTRACT been completed. The profit allowed shall in no event exceed four (4) percent of cost.

9-8.4.3 The reasonable cost to CONTRACTOR of handling material returned to the vendor, which material was delivered to the COUNTY or otherwise disposed of, as directed by the ENGINEER.

9-8.4.4 A reasonable allowance for CONTRACTOR's administrative costs in determining the amount payable due to termination of the CONTRACT.

9-8.5 All records of CONTRACTOR and SUBCONTRACTORS, necessary to determine compensation in accordance with the provisions of this Section, shall be open to inspection or audit by representatives of the COUNTY, at all times after issuance of the notice that the CONTRACT is to be terminated. Such records shall be retained and kept open for inspection or audit for a period of three (3) years.

9-8.6 After acceptance of the WORK by the COUNTY, the ENGINEER may recommend payments on the basis of interim estimates, pending issuance of the Final Estimate, in accordance with Section 10-9.1, "Final Payment and Claims," provided that in the ENGINEER's opinion, the amount thus paid together with all amounts previously paid or allowed, will not result in total compensation in excess of that to which CONTRACTOR will be entitled. All payments, including payment upon the Final Estimate, shall be subject to deduction for prior payments and amounts, if any, to be kept or retained under the provisions of the CONTRACT.

9-8.7 The provisions of this Section 9-8 shall be included in all SUBCONTRACTS.

9-9 COUNTY'S RIGHT TO TAKE POSSESSION OF THE WORK IN WHOLE OR IN PART

It is agreed that the COUNTY has the right, at any time, to enter upon the premises of the WORK and perform work not covered by this CONTRACT, either by day labor or by direct contract with other contractors, or to occupy and use a portion of the premises prior to the date of the final acceptance of the WORK as a whole, without in any way relieving the CONTRACTOR of any obligations under this CONTRACT.

Such use or occupation of the premises shall not be construed as an acceptance of any portion of the WORK under this CONTRACT.

SECTION 10 - MEASUREMENT AND PAYMENT

10-1 MEASUREMENT OF QUANTITIES

Payment for all WORK bid at a price per unit of measurement will be based upon the actual quantities of work as measured upon completion. The COUNTY does not expressly or by implication agree that the actual amount of work or materials of any class will correspond to the estimated quantities given in the PROPOSAL. CONTRACTOR shall make no claim nor receive any compensation for anticipated profits, for loss of profit, for damages, or for any extra payment whatever because of any difference between the amount of WORK actually done or materials furnished and the estimated amount.

All work to be paid for at a CONTRACT price per unit of measurement will be measured by the ENGINEER in accordance with United States Standard Measures. A ton shall consist of 2,000 pounds avoirdupois.

CONTRACTOR shall bear the expense of and make all arrangements for the measurement of materials paid for by weight.

All weighing, measuring, and metering devices used to measure the quantity of materials used in the WORK shall be suitable for the purpose intended, and shall conform to the tolerances and specifications as outlined in Title 4, Chapter 8 of the California Administrative Code, and these SPECIFICATIONS.

Whenever pay quantities of material are determined by weighing, the scales shall be operated by a weighmaster licensed in accordance with the provisions of the California Business and Professions Code, Division 5, Chapter 7. Upon request by the ENGINEER, CONTRACTOR shall furnish a Public Weighmaster's Certificate, or a Private Weighmaster's Certificate, or certified daily summary weigh sheets. A representative of the COUNTY may, at the discretion of the ENGINEER, be present to witness the weighing and to check and compile the daily record of such scale weights.

The operator of each vehicle weighed shall obtain a weight or load slip from the weighmaster and deliver said slip to the ENGINEER at the point of delivery of the material.

Vehicles used to haul material being paid for by weight shall be weighed empty daily, and at such additional times as the ENGINEER may direct. Each vehicle shall bear a plainly legible identification mark.

Quantities of material wasted, or disposed of, in a manner not called for under the CONTRACT; or rejected loads of material, including material rejected after it has been placed by reason of failure of CONTRACTOR to conform to the provisions of the CONTRACT; or material not unloaded from the transporting vehicle; or material placed outside of the lines indicated on the PLANS or established by the ENGINEER; or material remaining on hand after completion of the

WORK; will not be paid for and such quantities will be deducted from the final total quantities. No compensation will be allowed for hauling and disposing of rejected material.

Full compensation for all expenses involved in conforming to the requirements specified in this Section shall be considered as included in the unit prices paid for the materials being measured or weighed, and no additional compensation will be allowed therefor.

10-2 SCOPE OF PAYMENT

Whenever it is specified that CONTRACTOR is to do work or furnish materials of any class for which no price is fixed in the proposal, it shall be understood that he is to do such work or furnish such materials without extra charge or allowance or direct payment of any kind. The cost of doing such work or furnishing such materials is to be included in the price bid for such other items of WORK as he may consider appropriate, unless it is expressly specified in the CONTRACT DOCUMENTS that such work or materials is to be paid for as EXTRA WORK.

CONTRACTOR shall accept the compensation provided in the CONTRACT as full payment for furnishing all labor, materials, tools, equipment, and incidentals necessary to the completed WORK and for performing all WORK contemplated and embraced under the CONTRACT; also for loss or damage arising from the nature of the WORK, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the WORK until acceptance by the COUNTY; and for all risks of every description connected with the prosecution of the WORK; and for all expenses incurred in consequence of the suspension or discontinuance of the WORK as provided in the CONTRACT; and for completing the WORK according to the PLANS and SPECIFICATIONS. Neither the payment of any estimate nor of any retained percentage shall relieve CONTRACTOR of any obligation to make good any defective WORK or material.

No compensation will be made in any case for loss of anticipated profits. No compensation will be made in any case for materials delivered to site but not installed.

10-3 RESERVED

10-4 RESERVED

10-5 RESERVED

10-6 STOP NOTICES

The COUNTY, by and through the ENGINEER or other appropriate COUNTY officer or officers, may at its option and at any time retain out of any amounts due CONTRACTOR, sums sufficient to cover claims filed pursuant to Section 9350 et seq. of the Civil Code.

10-7 PARTIAL PAYMENTS

The BOARD OF SUPERVISORS, once in each month, shall cause an estimate in writing to be made by the ENGINEER. The estimate shall include the total amount of WORK done to date and acceptable materials incorporated into the WORK.

The COUNTY shall retain a percentage of the estimated value of the WORK done and acceptable materials incorporated into the WORK as partial security for the fulfillment of the CONTRACT by CONTRACTOR set forth in Section 11-21 “Payment Retention”.

The ENGINEER shall show on the estimate the balance of the amount due CONTRACTOR, at the time of the estimate, less all previous payments and all sums to be kept or retained under the provisions of the CONTRACT.

CONTRACTOR shall, upon receipt of the estimate, submit to the ENGINEER for payment, an invoice reflecting the balance shown on the estimate. Upon receipt, the ENGINEER shall review the payment request to determine whether it is undisputed and suitable for payment. If the payment request is determined to be unsuitable for payment, it shall be returned to CONTRACTOR as soon as practicable but not later than seven (7) DAYS after receipt, accompanied by a document setting forth in writing the reasons why the payment request is not proper. The COUNTY shall make the progress payment within thirty (30) DAYS after the receipt of an undisputed and properly submitted payment request from CONTRACTOR, provided that a release of liens and claims has been received from the CONTRACTOR pursuant to Civil Code section 8132. The number of days available to the COUNTY to make a payment without incurring interest pursuant to this paragraph shall be reduced by the number of days by which the ENGINEER exceeds the seven (7) day requirement.

No such estimate or payment shall be required to be made when, in the judgment of the ENGINEER, the WORK is not proceeding in accordance with the provisions of the CONTRACT, or the total value of the WORK done since the last estimate amounts to less than $300.

The COUNTY may withhold a sufficient amount or amounts of any payment or payments otherwise due to CONTRACTOR, as in his judgment may be necessary to cover:

Payments which may be past due and payable for just claims against CONTRACTOR or any SUBCONTRACTORS for labor or materials furnished in and about the performance of work on the PROJECT under this CONTRACT.

Defective work not remedied.

Failure of CONTRACTOR to make proper payments to its SUBCONTRACTOR or for material or labor.

Completion of the CONTRACT if there is a reasonable doubt that the WORK can be completed for balance then unpaid.

Damage to another contractor or a third party.

Amounts which may be due the COUNTY for claims against CONTRACTOR.

Failure of CONTRACTOR to keep the record (“as-built”) documents up to date.

Failure to provide update on construction schedule as required herein.

Site cleanup.

Failure to comply with CONTRACT DOCUMENTS.

Liquidated damages.

Legally permitted penalties.

No such estimate or payment shall be construed to be an acceptance of any defective WORK or improper materials. Attention is directed to the express prohibition against payment to unlicensed contractors contained in Government Code Section 14311.5, the provisions of which are set forth in Section 8-1.8, "Contractor's Licensing Law."

10-8 SUBSTITUTION OF SECURITIES FOR WITHHELD MONEY

Pursuant to Public Contract Code Section 22300, at the request and expense of CONTRACTOR, securities equivalent to the amount withheld shall be deposited with the COUNTY, State Treasurer, or with a State or Federally chartered bank in California, as the escrow agent, who shall pay such monies to CONTRACTOR upon satisfactory completion of the CONTRACT.

Alternatively, CONTRACTOR may request pursuant to Public Contract Code Section 22300, and the COUNTY shall make payment of retentions earned directly to the escrow agent. CONTRACTOR shall receive the interest earned on the investments upon the same terms provided for in this Section for securities deposited by CONTRACTOR. Upon satisfactory completion of the CONTRACT, CONTRACTOR shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from the COUNTY.

Securities eligible for investment under this Section shall include those listed in Government Code Section 16430, or bank, savings and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by CONTRACTOR and the COUNTY.

CONTRACTOR shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.

Any escrow agreement entered into pursuant to this Section shall be substantially similar to the form provided by Public Contract Code Section 22300(f).

10-9 PAYMENT AFTER ACCEPTANCE

After the WORK has been accepted by the COUNTY as provided in Section 6-9, "Final Inspection, Field Acceptance and Acceptance by the Board," payments will be made to CONTRACTOR subject to the provisions in that Section.

10-9.1 FINAL PAYMENT AND CLAIMS

After acceptance by the BOARD OF SUPERVISORS, ENGINEER will prepare a proposed final estimate, in writing, of the total amount payable to CONTRACTOR. This final estimate will include an itemization of the final CONTRACT amount, segregated as to CONTRACT item quantities, change order work and any other basis for payment. It will show therein all deductions made or to be made, for prior payments, and amounts to be kept or retained under the provisions of the CONTRACT. All prior estimates and payments shall be subject to correction in the proposed final estimate.

The COUNTY shall file a Notice of Completion with the County Recorder's Office after acceptance of the CONTRACT.

Within five (5) DAYS after acceptance of the CONTRACT, CONTRACTOR shall submit to the ENGINEER written approval of said proposed final estimate or a written statement of all claims arising under or by virtue of the CONTRACT. No claim will be considered that was not included in said written statement of claims, nor will any claim be allowed for which a notice or protest is required by these SPECIFICATIONS unless CONTRACTOR has complied with the Notice of Protest requirements in said Section.

Upon CONTRACTOR's approval, or failure to file a claim within said period of five (5) DAYS, the proposed final estimate submitted to the CONTRACTOR shall become the final estimate, and within thirty (30) DAYS thereafter, the COUNTY will pay the entire sum so found to be due, provided that a release of liens and claims has been received from the CONTRACTOR pursuant to Civil Code section 8136. Such final estimate and payment thereon shall be conclusive and binding against both parties to the CONTRACT, on all questions relating to the amount of WORK done and the compensation payable therefor, except as otherwise provided in Sections 10-4-2, "Records," and 10-10, "Clerical Errors."

If CONTRACTOR within said period of five (5) DAYS files claims, the COUNTY shall make payment based on the proposed final estimate, pending final determination by the ENGINEER, regarding said claims as provided in this Section 10-9.

The claims filed by CONTRACTOR shall be in sufficient detail to enable the ENGINEER to ascertain the basis and amount of said claims. The ENGINEER will consider and determine CONTRACTOR's claims. CONTRACTOR must furnish within a reasonable time such further information and details as may be required, by the ENGINEER, to determine the facts or

contentions involved in the claims. Failure to submit such information and details will be sufficient cause for denying the claims.

The ENGINEER will make the final determination of any claims which remain in dispute after a completion of a claim's review. CONTRACTOR may meet with the ENGINEER to make a presentation in support of such claims.

Upon final determination of the claims, the ENGINEER shall then make and issue a final estimate in writing. Within thirty (30) DAYS thereafter the COUNTY will pay the entire sum, if any, found due thereon, provided that a release of liens and claims has been received from the CONTRACTOR pursuant to Civil Code section 8136. Such final estimate shall be conclusive and binding against both parties to the CONTRACT, on all questions relating to the amount of WORK done and the compensation payable therefor, except as otherwise provided in Sections 10-4.2, "Records," and 10-10, "Clerical Errors." No payments, however, final or otherwise, shall operate to release CONTRACTOR or its sureties from the BONDS, or from any other obligation under this CONTRACT.

10-10 CLERICAL ERRORS

Notwithstanding the provisions in Section 10-9, "Payment After Acceptance," for a period of three (3) years after acceptance of the WORK, all estimates and payments made pursuant to said Section 10-9, including the final estimate and payment, shall be subject to correction and adjustment for clerical errors in the calculations involved in the determination of quantities and payments. CONTRACTOR and the COUNTY agree to pay to the other any sum due under the provisions of this Section 10-10, provided, however, if the total sum to be paid is less than Two Hundred Dollars ($200.00), no such payment shall be made.

PART 2 - SPECIAL PROVISIONS

SECTION 11 - SPECIAL PROVISIONS

11-1 PROJECT

The WORK to be done under this CONTRACT consists of furnishing all labor, materials, equipment, transportation and services necessary for the Construction of Extraction Well Pipelines which includes the installation of two parallel pipelines; as well as connections to the existing groundwater extraction wells and air stripper facility.

11-2 PROJECT LOCATION AND ACCESS

The PROJECT is located at the YCCL, bounded by County Road 104 on the west and County Road 28H on the south, approximately three (3) miles northeast of the City of Davis. (See location map on cover sheet of Plans).

Yolo County Central Landfill

44090 County Road 28H

Woodland, CA 95776

Normal operating hours are Monday through Saturday 6:30 a.m. to 4:00 p.m., and Sunday 8:00 a.m. to 4:00 p.m.

As a COUNTY facility, any Work must follow Yolo County Code of Ordinances (see https://www.yolocounty.org/general-government/board-of-supervisors/county-code). The COUNTY is directing attention to the following COUNTY Ordinances while working within the Facility:

- Section 6-18.003 Prohibition of smoking in county buildings, on county property, and enclosed public places.

11-3 DEFINITIONS

[RESERVED]

11-4 SUBMISSION OF BIDS AND AWARD OF CONTRACT

[RESERVED]

11-5 PROSECUTION AND PROGRESS

Section 9-1 of the GENERAL PROVISIONS shall be amended to include the following:

The CONTRACTOR shall be required to commence WORK under this CONTRACT within SEVEN (7) DAYS after the date of receipt by the CONTRACTOR of NOTICE TO PROCEED.

Section 9-4 of the GENERAL PROVISIONS shall be amended to include the following:

The CONTRACTOR shall diligently prosecute the CONTRACT to completion FORTY (40) WORKING DAYS after the commencement of the WORK.

Section 9-5 of the GENERAL PROVISIONS shall be amended to include the following:

If the WORK required under this CONTRACT is not completed within the CONTRACT TIME, the CONTRACTOR shall pay to the COUNTY, as fixed and liquidated damages and not as penalty, the sum of One-thousand dollars ($1,000) for each and every DAY of delay in finishing the WORK in excess of the CONTRACT TIME.

11-6 MEASUREMENT AND PAYMENT

Section 10-1 of the GENERAL PROVISIONS shall be amended to include the following:

Measurement for all WORK bid as a lump sum will be based upon the ENGINEER'S estimated percentage of the work completed. ENGINEER may request and CONTRACTOR shall provide any information necessary, such as material invoices for materials delivered to the job site but not yet installed to determine the percentage of work complete. All determinations as to the percentage of work complete by the ENGINEER are final. In no instance shall the percent complete exceed one hundred percent.

Bid Item #1 Mobilization/Demobilization:

1. Basis of Measurement: Lump Sum (LS)

2. Basis for Payment: Contract unit price per lump sum. 50 percent payment for mobilization after 10 percent of the work is completed and 50 percent payment for demobilization at the completion of the project.

3. Includes mobilization and demobilization of equipment, materials, and labor as required to complete the work, prepare Contractor's staging area including all temporary control facilities and temporary controls, set-up and maintenance of a field office, payment and performance bonds, and any other administrative costs necessary to complete the work described herein. Fifty percent (50%) of the mobilization/demobilization will be paid after mobilization and completion of ten percent (10%) of the work. The balance of the payment will be made after submittal to and acceptance by Owner of the Record Drawings. The total amount quoted for mobilization/demobilization in the base bid schedule shall not exceed ten (10) percent of the total net base bid price.

Bid Item #2 Prepare and Implement Drainage and Erosion control Plan:

1. Basis of Measurement: Lump Sum (LS)

2. Basis for Payment: Payments for "Prepare and Implement Drainage and Erosion Control Plan" will be made as follows:

a. After the Drainage and Erosion Control Plan has been approved by the Engineer, 75 percent of the contract item price for "Prepare and Implement Drainage and Erosion Control Plan" will be included in the monthly progress estimate.

b. After acceptance of the contract in conformance with the provisions in Section 6-9, " Final Inspection, Field Acceptance and Acceptance by the Board," of the Standard Specifications, payment for the remaining percentage of the contract item price for "Prepare and Implement Drainage and Erosion Control Plan" will be made in conformance with the provisions in Section 10-9.1, "Final Payment and Claims."

3. Basis for Payment: The contract lump sum price paid for "Prepare and Implement Drainage and Erosion Control Plan" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing, obtaining approval of, implementing and amending the Drainage and Erosion Control Plan, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

Bid Item #3 Well connections and wellhead piping modifications:

1. Basis of Measurement: Each (EA)

2. Basis for Payment: Contract unit price per each well connection and well piping modification complete.

3. Includes all labor, materials, equipment and incidentals to complete each well connection and well piping modification in accordance with the Specifications and Construction Drawings.

Bid Items #4 – 5 are covered in the technical provisions and construction drawings.

11-7 LABOR SURCHARGE

Section 4-4.1.1B of the GENERAL PROVISIONS shall be amended to include the following:

The labor surcharge set forth in the Department of Transportation publication entitled Labor Surcharge and Equipment Rental Rates shall not be used, instead the labor surcharge for force account payments shall be fifteen (15) percent for regular time and fifteen (15) percent for overtime.

11-8 PROGRESS SCHEDULE

[RESERVED]

11-9 SURVEYS, LINES, AND GRADES

[RESERVED]

11-10 SITE FACILITIES

[RESERVED]

11-11 SITE UTILITIES

[RESERVED]

11-12 DUST CONTROL

[RESERVED]

11-13 TRAFFIC CONTROL

[RESERVED]

11-14 EXISTING IMPROVEMENTS

[RESERVED]

11-15 DIFFERING SITE CONDITIONS

[RESERVED]

11-16 RECORD DOCUMENTATION

[RESERVED]

11-17 QUALITY CONTROL

[RESERVED]

11-18 ACCESS TO WORK BY OTHER AGENCIES

[RESERVED]

11-19 DIVERSION AND CONTROL OF WATER

[RESERVED]

11-20 COORDINATION OF WORK

Section 8-14 of the GENERAL PROVISIONS shall be amended to include the following:

CONTRACTOR is advised that the construction of the Extraction Well Pipelines at the site could occur concurrently with the: Waste Management Unit 6H Base Liner System. The CONTRACTOR is fully responsible for coordinating activities with COUNTY, including but not limited to: construction staging and material storage areas, material delivery, site access, utilization of on-site water, traffic control. No provisions for schedule or cost adjustments shall be provided by the COUNTY due to alleged delays or other alleged impacts arising from nearby activities. The COUNTY may extend the CONTRACT TIME or award non-working days if delays are caused by concurrent projects.

11-21 PAYMENT RETENTION

The second paragraph of Section 10-7 of the GENERAL PROVISIONS shall be replaced by the following:

The COUNTY shall retain five (5) percent of the estimated value of WORK done and acceptable materials incorporated into the WORK as a partial security for the fulfillment of the CONTRACT by the CONTRACTOR.

11-22 PROJECT FUNDING

Funding for this PROJECT is provided below:

Funding Source	Percentage of Funding
Yolo County Sanitation Enterprise Fund	100%
California State Grant	0%
Federal Grant	0%

11-23 TERM AND TERMINATION

For COUNTY accounting purposes only, this CONTRACT shall terminate when a Notice of Completion is filed with the County Recorder of Yolo County and all payments have been made to

the CONTRACTOR, and in no event later than June 30th, 2023. Notwithstanding the foregoing, any and all representations, warranties, indemnifications, and guarantees made in, required by, or given in accordance with the CONTRACT DOCUMENTS, as well as all continuing obligations under the CONTRACT DOCUMENTS or law, shall survive final payment, completion, and acceptance of the WORK or termination or completion of the AGREEMENT.

11-24 SOLE SOURCE

[RESERVED]

11-25 STORM WATER POLLUTION PREVENTION

Section 5-17 of the GENERAL PROVISIONS shall be replaced by the following:

Storm, surface, ground, nuisance, or other waters may be encountered at various times during construction of the WORK. Therefore, the CONTRACTOR hereby acknowledges that it has investigated the risk arising from such waters, has prepared its PROPOSAL accordingly, and assumes any and all risks and liabilities arising therefrom.

No separate payment shall be allowed for the diversion and control of water. All costs to maintaining dry working areas shall be included in the unit prices paid for other items of WORK in the PROPOSAL.

CONTRACTOR shall keep itself and SUBCONTRACTORS, staff, and employees fully informed of and in compliance with all local, state and federal laws, rules and regulations that may impact, or be implicated by the performance of the WORK including, without limitation, all applicable provisions regulating discharges of storm water; the Federal Water Pollution Control Act (33 U.S.C. § 13000 et seq.); the California Porter-Cologne Water Quality Control Act (Cal Water Code §§ 13000-14950); and any and all regulations, policies, or permits issued pursuant to any such authority.

CONTRACTOR shall comply with all conditions of the State Water Resources Control Board ("State Water Board") National Pollutant Discharge Elimination System General Permit for Stormwater Discharges Associated with Industrial Activities, Order 2014-0057-DWQ (Industrial General Permit) for all activities which results in the disturbance of in excess of one acre of total land area or which is part of a larger common area of development or sale. CONTRACTOR shall comply with the lawful requirements of the COUNTY, and any other applicable municipality, drainage district, or other local agency with jurisdiction over the location where the WORK is to be conducted, regarding discharges of storm water to separate storm drain systems or other watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs.

The CONTRACTOR shall comply with all requirements of the Storm Water Pollution Prevention Program (SWPPP) for the Yolo County Central Landfill. The CONTRACTOR shall prepare and implement a drainage and erosion control plan for the duration of the PROJECT for review and approval by the ENGINEER. The CONTRACTOR shall determine necessary interim drainage measures required for the WORK area. The CONTRACTOR assumes all responsibility for protection of his WORK from damages due to storm water erosion, etc. for the duration of the PROJECT. All costs relative to compliance with the SWPPP as well as drainage and erosion control shall be included in the cost of the various items of WORK and no additional compensation shall be made therefore. Copies of the SWPPP for the site are available through the Yolo County Central Landfill.

Failure to comply with the General Industrial Permit, laws, regulations, and ordinances listed in this Section is a violation of federal and state law. Notwithstanding any other indemnity contained in the CONTRACT DOCUMENTS, CONTRACTOR agrees to indemnify and hold harmless the COUNTY its officials, officers, agents, employees and authorized volunteers from and against any and all claims, demands, fees, costs, expenses, or losses or liabilities of any kind or nature which the COUNTY, its officials, officers, agents, employees and authorized volunteers may sustain or incur for noncompliance with the Permit, laws, regulations, and ordinances listed above, arising out of or in connection with the WORK, except for liability resulting from the sole established negligence, willful misconduct or active negligence of the COUNTY, its officials, officers, agents, employees or authorized volunteers.

All fines imposed by regulating agencies related to compliance with the SWPPP are the responsibility of the CONTRACTOR. The COUNTY reserves the right to defend any enforcement action or civil action brought against the COUNTY for CONTRACTOR's failure to comply with any applicable water quality law, regulation, or policy. CONTRACTOR hereby agrees to be bound by, and to reimburse the COUNTY for the costs associated with, any settlement reached between the COUNTY and any relevant enforcement entity.

PART 3 - TECHNICAL PROVISIONS

Bound Separately

PART 4 - PROPOSAL AND CONTRACT

Bound Separately

PART 5 - PROJECT DRAWINGS

Bound Separately

PART 3 – TECHNICAL PROVISIONS

Technical Specifications
Parallel Groundwater Pipeline Installation
Yolo County Central Landfill
Davis, California

Prepared for

Yolo County Central Landfill
Davis, California

Prepared by

DBS&A
Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

6020 Academy NE, Suite 100
Albuquerque, New Mexico 87109
www.dbstephens.com
AU21.1117

October 15, 2021

Yolo County Central Landfill, Davis, CA
Parallel Groundwater Pipeline Installation
Technical Specifications

DIVISION 1 – GENERAL REQUIREMENTS

DIVISION 15 – MECHANICAL

California Greenbook Reference

SECTION 306 - Open Trench Conduit Construction

Yolo County

Yolo County Improvement Standards, Section 8

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.1 Section Includes

A. Work description.

B. Future work.

C. Specification conventions.

1.2 Related Sections

A. 01300 Submittal Procedures

B. 01720 Record Drawings

1.3 Work Description

A. The project will construct two parallel pipelines connecting multiple groundwater extraction wells to the existing groundwater extraction system at the Yolo County Central Landfill (YCCL) near Davis, CA.
   1. One pipeline will be for conveyance of groundwater that is contaminated with volatile organic compounds (VOCs) to an existing air stripper facility for treatment (approx. 4,120 linear feet).
   2. The other pipeline will be for groundwater with no observed contaminant exceedances (approx. 3,592 linear feet).
   3. The pipeline designated for uncontaminated groundwater will connect to an existing “clean” water pipeline adjacent to the air stripper facility.

B. All scope of work items are to be conducted according to the construction drawings and technical specifications included with these Contract Drawings and Bid Documents.

C. Perform Work of Contract under unit price contract with Owner in accordance with Conditions of Contract.

1.4 Specification Conventions

A. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 Section Includes

A. Transmittal of submittals

B. Submittal procedures

C. Definition of submittal types for construction

D. Submittals for contract closeout

E. Forms for transmittal and review

1.2 Related Sections

A. Section 01720 Record Drawings

1.3 Definitions

A. Action Submittals: Written and graphic information and physical samples that require the Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written or graphic information and physical samples that do not require the Engineer responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. Close-out Submittals: Written and graphic information and extra stock materials that require Engineer responsive action. Close-out submittals are those submittals indicated in individual Specification Sections as "close-out submittals."

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 Submittal Administrative Requirements

A. Transmittal of Submittals:
   1. Provide submittals as indicated in the specific specification sections.
   2. Use a GLA Submittal Transmittal Form or County (or Owner) approved form to transmit submittals at the times specified in the log.

a. Obtain electronic version of Submittal Transmittal Form at the preconstruction conference for use during construction.

3. Engineer Digital Data Files: Electronic digital files of the Construction Subcontract Drawings will be provided by Engineer for Construction Subcontractor's use in preparing submittals.
4. Engineer will furnish Construction Subcontractor one set of digital data drawing files of the Contract Drawings for use in preparing Submittals, Shop Drawings, Delegated Design Submittals, and Project record drawings.
   a. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD Civil 3D 2018.

B. Pre-Construction Submittals
1. At or before the pre-construction conference, the Contractor shall submit the following in accordance with the General Conditions of the Construction Contract:
   a. Construction schedule
      1) Gantt chart format, showing all major items of work and sequencing to achieve substantial completion within the contract time.
      2) The construction schedule shall be updated to show percent completion by task and the updated schedule shall be submitted with each pay request, or at a minimum monthly

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently. In general, submitting earlier than required is always allowed/preferable.
3. Submit action submittals, informational submittals and sustainable design submittals required by the same Specification Section as one submittal under the same transmittal.
4. Submit close-out submittals required by the same Specification Section as separate package under separate transmittal.
5. Submit delegated design submittals required by same Specification Section as one submittal under the same transmittal.
6. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
   a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including submittals.
1. Product data, samples, design data, test reports, qualification data and certifications: Allow 5 working days for review of each submittal. Allow

additional time if coordination with subsequent submittals is required. Engineer will advise Construction Subcontractor when a submittal being processed must be delayed for coordination.

2. Shop drawings, coordination drawings, sustainable design and delegated design submittals: Allow 10 working days for review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Construction Subcontractor when a submittal being processed must be delayed for coordination.
3. Close-out submittals: Allow 10 working days for review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Construction Subcontractor when a submittal being processed must be delayed for coordination.
4. Resubmittal Review: Allow 10 working days for review of each resubmittal.
5. The Construction Subcontractor shall allow a minimum of 5 working days after completion of the submittal review for return of submittals.

E. Submittal Review
1. After review of the submittal package the "Action Code" will be indicated on the submittal routing sheet and returned to the Construction Subcontractor. Review of submittals will be indicated on each Submittal Routing sheet by appropriate signature, stamp, and date.
2. Owner will document submittal review comments on the Submittal Review Record form. Retain submittal review comments with the submittal documents.
3. Submittal will be by Owner, who will use the following "Action Codes" to indicate the status of submittals resulting from the review, and the action required of the Construction Subcontractor:
    a. No exceptions taken
    b. Revise and resubmit
    c. Make corrections noted
    d. Rejected

F. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittals of a single Submittal Log item and Submittal Transmittal Form with links enabling navigation to each item.
2. Name file with sequential submittal number, including revision identifier (A, B, C, etc.).
3. Transmittal Form for Electronic Submittals: Use GLA Submittal Transmittal Form or County (or Owner) approved form. Form shall be converted to PDF and combined with submittal PDF into a single PDF file.

G. Options: Identify options requiring selection of Engineer.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.

3. Resubmit submittals until they are marked with approval notation from Engineers action code.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer action code.

PART 2 PRODUCTS

2.1 Submittal Procedures

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Post electronic submittals as PDF electronic files directly to website specifically established for Project.
   a. Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
   b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. Calculations: Prepare design calculations to document analytical determinations to reflect the basis for selection of systems and components. Room numbers, equipment nomenclature, fixture numbers, zone numbers, or any other designations must be consistent with those indicated on the drawings or specifications. Calculations must be checked, reviewed, sealed when required and dated by the designer and checker, and complete in all respects.

C. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
   a. Manufacturer’s catalog cuts.
   b. Manufacturer’s product specifications.
   c. Standard color charts.

d. Statement of compliance with specified referenced standards.
e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.
h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams showing factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:
   a. PDF electronic file.
   b. Five paper copies of Product Data unless otherwise indicated. Engineer will return one copy.

D. Qualification Data (QD): Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

E. Project Record Documents: Comply with requirements specified in Section 01720 Project Record Documents.

F. Samples/Colors: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

G. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Construction Subcontract Documents or standard printed data unless submittal based on Engineer's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Construction Subcontract Documents. Include the following information, as applicable:
   a. Identification of products.
   b. Schedules.
   c. Compliance with specified standards.
   d. Notation of coordination requirements.
   e. Notation of dimensions established by field measurement.
   f. Relationship and attachment to adjoining construction clearly indicated.
   g. Seal and signature of professional engineer if specified.

H. Spare Parts and Maintenance Materials: Submit spare parts, extra materials and maintenance materials in quantities, sizes, finishes and colors as identified in each specific specification. Parts and materials to be in manufacturer's original packaging with original labeling. Identify location where parts or materials are installed within facility.

1. Description of product.
2. Test procedures and results.

3. Limitations of use.

I. Warranty: Submit written and executed documentation of warranties as specified in applicable specification sections. Refer to Section 01730 Operation and Maintenance Data.

PART 3 EXECUTION

3.1 Construction Subcontractor's Review

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Construction Subcontract Documents. Note corrections and field dimensions

B. Construction Subcontractor Review: Certify that submittal has been reviewed, checked, and approved for compliance with the Construction Subcontract Documents on the Submittal Transmittal form. Provide any comments on the Submittal Transmittal form.

3.2 Engineer's Action

A. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will indicate action code on GLA Submittal Review form. Provide any comments on the GLA Submittal Review Record Form.

B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Construction Subcontract Documents may be returned by the Engineer without action.

END OF SECTION

SECTION 01720

RECORD DRAWINGS

PART 1 GENERAL

1.1 General

A. Record drawings refer to those documents maintained and annotated by the Contractor during construction and are defined as:
   1. A neatly and legibly marked set of contract drawings showing the final location of piping, equipment, electrical conduits, outlet boxes and cables.
   2. Additional documents such as schedules, lists, drawings, and electrical and instrumentation diagrams included in the specifications.
   3. Contractor layout and installation drawings.

B. Unless otherwise specified, record drawings shall be full size and maintained in a clean, dry, and legible condition. Record documents shall not be used for construction purposes and shall be available for review by the Construction Manager during normal working hours at the Contractor's field office. At the completion of the work, prior to final payment, all record drawings shall be submitted to the Construction Manager.

C. Marking of the drawings shall be kept current and shall be done at the time the material and equipment are installed. Annotations to the record documents shall be made with an erasable colored pencil conforming to the following color code:
   1. Additions - Red
   2. Deletions - Green
   3. Comments - Blue
   4. Dimensions - Graphite*

*Legibly mark to record actual depths, horizontal and vertical location of underground raceways, cables, and appurtenances referenced to permanent surface improvements.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 15063

HIGH-DENSITY POLYETHYLENE PIPE

PART 1 GENERAL

1.1 Section Includes

A. This section includes high-density polyethylene (HDPE) pipe for conveyance of untreated and treated groundwater. Construction may include surface preparation, trench excavation, shoring, dewatering, lay, align, and join pipe, installation of appurtenances, bedding and backfilling, surface restoration, and other related work.

1.2 Related Sections

A. California Greenbook Section 306

1.3 References

A. ASTM International (ASTM):
1. D-3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Material
2. D-2239-Polyethylene Plastic Pipe (SIDR-PR). (Iron Pipe Size; Inside Diameter)
3. D-2657-Guideline for Polyolefin Thermoplastic Butt Fusion Heat Welding
4. D-2737-Polyethylene Plastic Tubing (Copper Tube Size; Outside Diameter)
5. D-2837- Method for Obtaining Hydrostatic Design Basis for Thermal Plastic Pipe Materials
6. D-3035-Polyethylene (PE) Plastic (DR-PR) Based on Controlled Outside Diameter (1/2” to 24”)

B. AWWA
1. C901 Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm) for Water Service

C. Plastic Pipe Institute (PPI):
1. Handbook of Polyethylene Pipe.
2. TR-33, Generic Butt Fusion Joining Procedure for Field Joining of Polyethylene Pipe.

1.4 Definitions

A. Product pipe: Inside pipe or carrier pipe, or single-walled pipe

B. Containment pipe: Outer pipe

1.5 Warranty

A. Warranty period is one year after date of substantial completion of installation.

1.6 Submittals

A. Details of pipe, fittings, and specials, including dimensions of spacers.

B. Certified laboratory test certificates for all items required in this section.

C. Product data for each type of double containment specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.

D. Product certificates signed by manufacturer of double containment product stating compliance with stated requirements.

E. Welder certificates certifying that welders comply with the installation procedures as outlined by ASTM D 2657 Section 9 prior to construction.

F. Qualification of firm supplying double containment piping.

G. Warranty information.

1.7 Quality Assurance

A. All HDPE pipe and fittings shall be from a manufacturer with a minimum of 10 years of experience in the design, installation, and operation of a thermoplastic piping system.

B. All HDPE pipe to be installed may be inspected at the factory for compliance with these Specifications by an independent testing laboratory. The cost of these plant inspections of all pipe approved, plus the cost of inspection of a reasonable amount of disapproved pipe, will be borne by the Manufacturer.

C. Inspection of the pipe shall also be made by the Engineer or other representatives of the Owner after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall immediately be removed from the job.

1.8 Delivery, Storage, and Handling

A. Responsibility for material:
   1. Shipping: Material shall be shipped so to not cut, kink, or otherwise damage pipe during transport.
   2. Subcontractor shall be responsible for all materials intended for the Work that are delivered to the construction site and accepted by Subcontractor. Payment shall not be made for materials found to be defective or damaged in handling after delivery and acceptance. Defective or damaged materials shall be removed and replaced with acceptable materials at Subcontractor’s expense.
   3. Subcontractor shall be responsible for the safe and proper storage of such materials.

a. Limit stacking of pipe to a height that will not cause excessive deformation of bottom layers of pipes under anticipated temperature conditions.
b. Where necessary, because of ground conditions, store pipe on wooden sleepers, spaced suitably and of such widths as not to allow deformation of pipe at point of contact with sleeper or between supports.
c. Keep pipe shaded from direct sunlight prior to installation in the trench.

B. Pipe acceptance:
1. In addition to any deficiencies not covered by the applicable ASTM specifications, pipe that has any of the following visual defects will not be accepted.
a. Cracks, bubbles, pinholes, inclusions, or occlusions that, because of their nature, degree, or extent, detrimentally affect the strength and serviceability of the pipe.

C. Pipe handling:
1. Pipe and accessories shall be delivered to, unloaded, and distributed at the site by Subcontractor. Each pipe shall be unloaded adjacent to or near the intended laying location.
2. Pipe fittings, specials, valves, and appurtenances shall be unloaded and stored in a manner that precludes shock or damage. Such materials shall not be dropped.
3. Pipe shall be handled to prevent damage to the pipe ends or to any coating or lining. Pipe shall not be skidded or rolled against adjacent pipe. Damaged coatings or lining shall be repaired or replaced by Contractor, at Contractor's expense in accordance with the recommendations of the manufacturer and in a manner satisfactory to Engineer. Physical damage to the pipe or accessory shall be repaired or replaced by Contractor at Contractor's expense, and in a manner satisfactory to Engineer.

PART 2 PRODUCTS

2.1 Materials

A. The pipe used to fabricate the system supplied under this specification shall be high density, extra high molecular weight polyethylene pipe. The pipe and fittings shall conform to ASTM D-3350 with minimum cell classification values of 345464C. The pipe and fittings shall be made from the same polyethylene resin base which meets this specification.

B. Allowable ASTM specifications: All material, manufacturing operations, testing, inspection, and making of HDPE pipe shall conform to the requirements of the appropriate allowable ASTM standard specifications, latest revision thereof, listed in the References.

C. Marking:
1. The following shall be clearly marked on both the interior and exterior surface of the pipe:
a. Class and size.

b. Date of manufacture.
c. Name or trademark of manufacturer.
d. Deflection angle for bends.

D. Diameter of pipe: Pipe supplied under this specification shall have IPS (iron pipe size) OD and shall meet ASTM D 3035. Provide pipe sizes of nominal diameter as shown on Drawings.

E. Thickness
1. 6-inch HDPE piping shall be DR 13.5.
2. 2-inch HDPE piping shall be DR 11.6, per ASTM D2239.

F. Joints shall be butt fused.

G. Fittings
1. Fittings shall be manufactured to the same IPS ID and OD as the pipe.
2. All molded and fabricated fittings shall meet the pressure requirements of the system as specified and based on ASTM D 2837 Hydrostatic Design Basis for Thermoplastic Pipes.
3. All molded fittings shall be manufactured per ASTM D3261.
4. Pipe joints and fittings shall be supplied to the job site ready for simultaneous butt-fusion.

PART 3 EXECUTION

3.1 General

A. Install piping to comply with manufacturer's recommended procedures.

B. Installers shall be pre-qualified through sufficient training in butt fusion techniques according to ASTM D2657 Section 9.

C. Hot gas welding shall not be allowed for wetted components.

D. Manufacturer/Manufacturer's Representative shall provide on-site training in the assembly, installation, and operation of double-containment systems.

E. Install continuous running pull rope for installation of leak detection cable if required. Manufacturer shall supply pipe spools with pull rope in place.

3.2 Dewatering

A. All pipe trenches and excavation for structures and appurtenances shall be kept free of water during pipe laying and other related work. Water shall be disposed of in a manner that does not inconvenience the public or result in a menace to public health. Pipe trenches shall contain enough backfill to prevent pipe flotation before dewatering is discontinued. Dewatering shall continue until such time as it is safe to allow the water to rise in the excavation.

3.3 Testing

A. HDPE piping shall be pressure tested per Yolo County Improvement Standards, Section 8, except that potable water is not required.

END OF SECTION

SECTION 15401

WATER UTILITIES

PART 1 GENERAL

1.1 Work Included

A. Pipes, materials and appurtenances for potable water systems.

B. Installation

1.2 Related Work

A. Section 15063 – High Density Polyethylene Pipe

B. Greenbook 2021, Section 306 – Open Trench Conduit Construction

1.3 References

A. AWWA:
1. C700: Cold water meters - displacement type.
2. C900: Polyvinyl chloride (PVC) pressure pipe 4" through 12" for water.

B. ASTM:
1. A733: A53 Standard Specification for Welded and Seamless Carbon Steel.
2. Dl598: Test for time-of-failure of plastic pipe under long-term hydrostatic pressure.
3. D1599: Test for short-term rupture strength of plastic pipe, tubing, and fittings.
4. Dl784: Polyvinyl chloride (PVC) compound and chlorinated polyvinyl chloride (PVC) compounds, rigid.
5. Dl785: Polyvinyl chloride (PVC) plastic pipe, Schedules 40, 80 and 120.
6. D2239: High density polyethylene pipe pressure rated
7. D2241: Polyvinyl chloride (PVC) plastic pipe (SDR-DO).
8. D3139: Joints for plastic pressure pipes using flexible elastomeric seals.

1.4 Submittals

A. The following shall be submitted in conformance with Section 01300.
1. Product Data
2. Manufacturer’s installation instructions.

1.5 General Requirements

A. Pipes, fittings and materials to be new, of highest quality and shall be in excellent condition when installed.

B. Pipe, fittings, and appurtenances of the same type and made by the same manufacturer.

C. Provide labor, equipment and materials for pipe field testing.

D. Contact and coordination with utility's owner is the full responsibility of the Contractor.

1.6 Handling and Storage of Pipe and Appurtenances

A. Pipe, valves, hydrants, and other appurtenances shall, unless otherwise directed, be unloaded, hauled and laid as follows:
   1. Pipe and appurtenances shall be lifted by hoists with broad well-padded contact surfaces, or rolled on skidways in such a manner to avoid shock.
   2. Under no circumstances shall pipe or appurtenances be dropped.
   3. Pipe must not be rolled or skidded against pipe already on the ground.

B. The Contractor shall be responsible for the safe storage of material furnished by or to him and accepted by him, and intended for the work, until it has been installed in the completed project.

C. Installation:
   1. In distributing material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.
   2. Pipe shall be handled in a manner that only a minimum amount of damage to the pipe exterior will result. Damaged piping shall be repaired in a manner satisfactory to the Engineer or replaced.
   3. The interior of all pipe, fittings, and other appurtenances shall be kept free from dirt and foreign matter at all times.

1.7 Quality Assurance

A. Valves:
   1. Valves shall be built and equipped for the type of operation shown on the Plans or as directed by the Engineer.
   2. All valves shall be of standard makes approved by the Engineer and shall have the name, monogram, or initials of the manufacturer cast thereon.

PART 2 PRODUCTS

2.1 Appurtenances

A. Resilient Wedge Gate Valves:
   1. Size as shown on Drawings.
   2. Mueller or Engineer approved equivalent.
   3. Valves shall conform to AWWA C-509 and comply with its latest revisions.
   4. The wedge shall be cast iron, fully encapsulated in molded rubber including the guides. The bronze stem nut must be rigidly enclosed in the wedge to maintain alignment.
   5. The stem shall have two O-rings above and one O-ring below the collar. Stem seats must be replaceable with the valve under pressure.
   6. The stem material shall be stainless steel (AISI420) or Engineer-approved equivalent.
   7. The waterway shall be full size to allow for tapping use; no cavities or depressions are permitted in the seat area.

8. Valve body and bonnet shall be electrostatically applied, fusion bonded and epoxy coated, both inside and out, by the valve manufacturer. The coating shall meet the requirements of AWWA C-550. Coating to be applied only at the valve manufacturer's facilities.
9. The bonnet bolts shall not be exposed to the environment or, alternatively, be in 316 stainless steel.
10. O-ring style seals shall be used as gaskets on the bonnet and on the stuffing box.
11. All valves must be tested by hydrostatic pressure equal to the requirements in the AWWA C-509 specifications prior to shipment from the manufacturer.
12. 2-inch AWWA operating nut for valves in below-ground service; handwheel for aboveground service.
13. Mechanical joint ends for pipe or as shown on drawings.

B. Ball Valves
1. 1¼-inch SCH 40 PVC
2. Pressure class 150 psi at 73°F, max temperature 140°F
3. ASTM F1970

C. Valve Boxes:
1. Cast iron, adjustable extension, traffic type.
2. Minimum thickness of metal at any point: $^{3}/_{16}$ inch.
3. Removable cast iron cover.
4. For valves on washwater and irrigation system only: Class 200 PVC pipe.
5. All valve boxes for plug valves shall be designed for integral installation of the required valve position indicator.
6. Cast iron boxes: Factory painted inside and out with manufacturer's recommended asphalt paint.
7. Cover marked "Water".

D. Water Meter Box:
1. Reinforced concrete
   a. Christy B36 Box, or equivalent
2. Reinforced concrete cover with a hinged cast iron lid and label
   a. Christy B36G cover, or equivalent

E. Locator Tape:
1. Tape shall be 6 inches wide and shall consist of one layer of metalized foil laminated between two layers of inert plastic film.
2. Laminated bonding that can be separated by hand is not acceptable.
3. Tape shall be a minimum of 5 mils thick with a minimum tensile strength of 84 lb per 3-inch width strip.
4. Tape shall be imprinted with a continuous warning message repeated a minimum of every 30 inches as follows:
   a. Yellow colored tape: Caution Gas Line Buried Below
   b. Blue colored tape: Caution Water line Buried Below
   c. Green colored tape: Caution Sewer Line Buried Below
5. Tape shall be inductively locatable and conductively traceable using standard pipe and cable locating device for a minimum of 8 years after direct burial.

6. Test results showing a minimum of 8 years life and full compliance of these specifications and a sample of the tape may be required to be furnished to the Doña Ana County Right-of-Way Administrator.

PART 3 EXECUTION

3.1 Installation

A. General:
1. Install as indicated on Drawings and AWWA C605: Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
2. Trenching, Backfilling and Compacting: Section 02221.
3. Pipe Cutting:
   a. Pipe cutting measurement taken at site.
   b. Cutting of pipe or inserting valves, fittings, or closure pieces shall be done in a neat and workman like manner without damage to the pipe.
4. Direction of Bells:
   a. Unless otherwise directed, pipe shall be laid with bell ends facing the direction in which work is progressing.
   b. Pipe laid on an appreciable slope shall be laid with bell ends facing uphill.
5. Pipe Plugs: At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer.
6. Pipe Cleanliness:
   a. Clean all pipe, fittings, and appurtenances before use.
   b. Foreign materials or objects shall be prevented from entering the pipe while it is placed in the trench.
7. Temporarily support, adequately protect and maintain all underground and surface utility structures, drains, sewers, and other obstructions encountered in the progress of work.

B. Pipe Alignment and Grade
1. All pipe shall be laid and maintained to the required lines and grades; with fittings, valves, and hydrants at the required locations, with joints centered and spigots home; and with all valve and hydrant stems plumb.
2. Deviations:
   a. Wherever existing utility structures or branch connections leading to main sewers or to main drains, or other conduits, ducts, pipes or structures present obstructions to the grade and alignment of the pipe, they shall be permanently supported, removed, relocated, or reconstructed by the Contractor through cooperation with the owner of the utility, structure, or obstruction involved.
   b. No deviation shall be made from the required line or grade except with the written consent of the Engineer.
   c. The Contractor shall make all necessary explorations to determine the location of existing pipes, valves, or other underground structures. The Owner and Engineer shall furnish all available information; however, such information cannot be guaranteed as accurate.

3. Depth of Bury:
    a. Depth of bury shall be as shown in the Plans.
    b. Minimum depth of bury is measured from the established road grade or the surface of the permanent improvement to the top of the barrels of the pipe.

C. Pipe Laying:
1. Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work.
2. All pipe fittings, valves and hydrants shall be lowered carefully into the trench by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to water main materials and protective coatings and linings.
3. Under no circumstances shall water main materials be dropped into trench.
4. Trench shall be dewatered prior to installation of pipe.

D. Jointing and Assembling:
1. Joints shall be installed in accordance with manufacturer's written Installation and Operation Manual and approved submittals.
2. Lubricants: Plant based soap solution suitable for use in potable water systems.
3. Take care to prevent entrance of soil and other contaminants.
4. All lumps, blisters, burrs or excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped leaned and dry and be free from dirt, sand, grit, or any other foreign materials.

3.2 Field Quality Control

A. All pipes and fittings tested in the presence of and to the satisfaction of the Engineer.

B. Test Conditions (PVC):
1. Medium: Water.
2. Perform test at 150 psi for one hour per 1,000 linear foot of pipe or 2 hours minimum

C. Testing Equipment:
1. Pressure gauge used to perform pressure test shall be a digital type gauge with the ability to display testing pressure to one hundredth (1/100) of a psi. The pressure gauge shall be rated for at least the required testing pressure.
2. When existing water mains are used to supply test water, they should be protected from backflow contamination by temporarily installing a double check-valve assembly between the test and supply main, or by other means approved by the Engineer.

D. Procedure (PVC):
1. Disconnect fixtures, equipment and accessories that may be damaged by test pressure.
2. Plug ends as required.
3. Water shall be applied by means of a pump connected to the pipe in a satisfactory manner.
4. All air shall be expelled from the pipe prior to pressure testing.

5. No installation will be accepted unless the leakage is less than the number of gallons per hour as determined by the following formula:

$$L = (N\ D\ Py,)/7,400$$

where: L = allowable leakage, gallons per hour.
N = number of joints in pipeline tested.
D = nominal diameter of pipe, inches.
P = test pressure, psi.

6. Leakage shall be defined as the quantity of water that must be supplied into the pipe section being tested to maintain a pressure within 5 psi of the specified leakage-test pressure after the pipe has been filled with water and the air in the pipeline has been expelled.
7. All joints showing visible leaks shall be properly repaired. Any cracked or defective pipes, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed and replaced by the Contractor with sound material, and the test repeated.
8. Retest repaired joints, pipes, and fittings until system is tight and test results are satisfactory to the Engineer.
9. Pipe testing and preparation for use should strictly follow AWWA C605 Section 7: Preparation for use.
10. Previously described procedures for hydrostatic testing is for Polyvinyl Chloride (PVC) pipe only.

3.3 Pipe Schedule

A. PVC and PVCO Pipe:
1. Pipe sizes 4-inch or less, ASTM 2241, PVC 1120, SDR-21 pressure class 200 psi.
2. Pipe sizes 4-inch through 12-inch, AWWA C900 SDR-14, pressure class 200 psi.
3. Pipe sizes 4-inch through 12-inch, “Ultra-Blue,” 200 psi pressure rating, with standard IPS O.D., and conforming to ASTM Dl 784, ASTM D2241, ASTM D3139, and ASTM F1483.
4. End connections to be push-on joints unless otherwise indicated on the Drawings.

B. Repair and/or replacement of existing water lines damaged during construction: Material generally to match existing or at least quality required by this section.

C. Provide sizes as shown on the Drawings and as provided for in the Bid Schedule.

3.4 Valve Schedule

A. Resilient wedge gate valves: as shown on the Drawings.

B. PVC ball valves: as shown on the Drawings.

C. Provide sizes as shown on the Drawings and as provided for in the Bid Schedule.

END OF SECTION

Trusses, when completed, shall show no irregularity of line. Chords shall be straight and true from end to end in horizontal projection, and in vertical projection shall show a smooth curve through panel points conforming to the correct camber. Uneven and rough cuts at the points of bearing will be cause for rejection of the piece containing the defect.

Laminated bridge floors shall be constructed as shown on the Plans. The planks shall be laid with the best edge down.

Spiking of deck planking in roadway areas of bridges and similar structures shall be accomplished by the means of an air hammer equipped with a suitable driving head so designed and constructed as to ensure that the spikes are driven to sufficient depth to draw the planking tightly to the joints without damaging or abrading the surface of the plank.

305-2.5 Painting. The railing of timber bridges, including the posts, the entire outer edge of bridge decks, except treated surfaces, and any other surfaces indicated on the Plans to be painted, shall be painted as specified in 210-1.5 and 310.

The surface of wooden guard rails above the ground shall be painted as prescribed in 210-1.5 and 310.

The lumber shall be cut to fit and the entire surface shall be given the specified prime coat. The remaining coats shall be applied after the structure has been erected.

305-2.6 Measurement and Payment. Timber structures will be paid for as provided in the Bid. Where board measure is used as the basis of payment, the quantity to be paid for will be determined from actual (nominal) widths and thicknesses and the actual lengths of the pieces in the finished structure, except that in the case of laminated timber flooring, the number of laminations to be paid for shall be the required number of the size specified after dressing and the length of each lamination shall be considered as the full width or length of the floor.

The Contract Unit Price per board measure, per linear foot (m) of structure, or the lump sum, shall include full compensation for furnishing all nails, hardware, paint, and wood preservative.

SECTION 306 - OPEN TRENCH CONDUIT CONSTRUCTION

306-1 GENERAL. This section includes specifications for trench excavation, construction of buried conduits, testing, backfill, and resurfacing.

306-2 DELIVERY, STORAGE, HANDLING, AND PROTECTION OF PIPELINE MATERIALS, FITTINGS, VALVES, AND APPURTENANCES.

306-2.1 General. Delivery, storage and handling of pipeline materials, fittings, valves and appurtenances shall conform with the pipe-specific installation instructions shown in Tables 306-2.1 (A) and 306-2.1 (B). Instructions shall be submitted to the Engineer in accordance with 3-8.4.

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TABLE 306-2.1 (A)

Gravity Pipe Material	Material Specification	Delivery, Storage, and Handling Reference Specification
Vitrified Clay Pipe	207-8	ASTM C12 Section 8
Nonreinforced Concrete Pipe	207-1	ASTM C1479
Reinforced Concrete Pipe	207-2	ASTM C1479
Lined Reinforced Concrete Pipe	207-3	ASTM C1479
Cast Iron Soil Pipe	207-9	California Plumbing Code Chapters 3 and 7
Corrugated Steel Pipe and Pipe Arches	207-11	ASTM A798 Section 8
Structural Steel Plate Pipe and Pipe Arches	207-12	ASTM A807
Corrugated Aluminum Pipe and Pipe Arches	207-13	ASTM B788
Structural Aluminum Plate Pipe and Arches	207-14	ASTM B789
ABS Solid Wall Pipe	207-15	ASTM D2321 Section 8
ABS or PVC Composite Pipe	207-16	ASTM D2321 Section 8
PVC Plastic Sewer Pipe	207-17	ASTM D2321 Section 8
Annular HDPE Pipe with Smooth Interior and Corrugated Exterior	207-18	ASTM D2321 Section 8
Polyethylene Solid-Wall Pipe	207-19	ASTM D2321 Section 8
FRPM Pipe	207-20	ASTM D2321 Section 8 or AWWA M45

TABLE 306-2.1 (B)

Pressure Pipe Material	Material Specification	Delivery, Storage, and Handling Reference Specification
Ductile Iron Pipe	209-1	AWWA C600 and AWWA M41 Chapter 11
Steel Pipe	209-2	AWWA C604 or AWWA M11 Chapter 12
Concrete Pressure Pipe	209-3	AWWA M9 Chapter 13
PVC Pressure Pipe	209-4	AWWA C605 or AWWA M23 Chapter 6
HDPE Pressure Pipe	209-5	AWWA M55 Chapter 7
Fiberglass Pressure Pipe	209-6	AWWA M45 Chapter 6
Valves, Hydrants, and Appurtenances	212	Manufacturer's Installation Instructions

306-2.2 Shipment and Delivery.

306-2.2.1 General. Shipment and delivery to the Work site shall conform to 3-12.4 and the following.

306-2.2.2 Factory Testing. In accordance with 4-3, pipe, valves, motors, actuators and mechanical equipment shall be operated and tested at the factory before shipping.

306-2.2.3 Packaging. Pipeline materials, fittings, valves and appurtenances shall be delivered to the Work site in the manufacturer's original, unopened, labeled packaging, containers, or bundles. Packages, containers, or bundles shall be tagged or labeled to identify the contents and equipment of which the contents form a part.

306-2.2.4 Lubricated Components. Oil or grease-lubricated gearing, bearings and components shall be shipped with an oil-soluble protective coating which shall provide protection for one year after completion of the Work and conform to the manufacturer's operation, maintenance, and warranty instructions. Oil-soluble coatings for parts which will be in contact with potable water shall conform to NSF 60 or 61 as appropriate.

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306-2.2.5 Shipping Records. The Contractor shall maintain records of deliveries showing the Contractor's order number, purchase order number, and equipment item number. Labeling or shipping tags shall be included in the records. The records shall be furnished to the Engineer for review if so requested.

306-2.3 Storage. Pipeline materials, fittings, valves, and appurtenances shall be stored at the Work site in accordance with the manufacturer's installation instructions.

Unless otherwise specified in the delivery, storage, and handling Reference Specification shown in Table 306-2.1 (A) or Table 306-2.1 (B), storage shall conform to the following requirements:

a) Products shall be stored in a protected dry area at a temperature between 35°F (2°C) and 110°F (43°C).

b) Exposed metals shall be protected from moisture, rust and corrosion, even when such items may be sandblasted or otherwise cleaned before painting. Any corrosion in evidence prior to completion of the Work shall be removed, or the product shall be removed or replaced.

c) Items not designed for outdoor exposure shall be stored off-ground and under cover. Items with factory-applied primers or non-cementitious coatings shall be stored off-ground.

d) Fasteners and connectors shall be stored in their original unopened containers until used.

e) Stored products shall be covered with a tarpaulin or other covering. Coverings shall be secured in-place.

f) Plastic and ultraviolet-sensitive items shall be covered.

g) Products shall be stored so as to preserve their quality and fitness in a location facilitating inspection. The Contractor shall be responsible for damage or loss to products until completion of the Work.

h) Products shall be protected against damage from improper handling, improper storage, vandalism or theft.

i) Flammable products shall be stored in conformance with applicable safety codes for storage of flammable materials.

j) Stringing of pipe and appurtenances along right of way shall be done in a manner that will not interfere with the requirements of Part 6.

k) Exterior surfaces of delivered items shall be free from imperfections that render products unfit for service.

l) The Contractor shall notify the Engineer in writing if any delivered or stored product is damaged. Damaged products shall not be repaired without the Engineer's prior written approval.

306-2.4 Handling.

306-2.4.1 General. Products shall be handled in accordance with the manufacturer's installation instructions. Items weighing over 100 pounds (45 kg) shall be lifted only at points designated by the manufacturer. Products shall not be dropped, dragged, bent, or handled in a manner that causes abrasions, bruises, cracks, mars, scars, scratches, or other damage. Padded slings and hooks shall be used for lifting as needed to prevent damage. Mishandled products will not be accepted.

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306-2.4.2 Coated Products. Coated pipe, valves, and other products shall be lifted, lowered or suspended using rubber or canvas belt slings or pneumatic-tired cradles. The sling width shall equal or exceed the pipe or product diameter. Coated products shall not be handled using ropes, hooks, chains, calipers, or cables.

Coated products shall be stored on padded or wooden skids.

306-2.4.3 Pre-Installation Inspection. Before installation, each product shall be inspected for damage, defects, completeness, and correct operation.

306-2.4.4 Pre-Installation Cleaning. Before installation, joints and interiors of piping materials, fittings, valves, and appurtenances shall be swabbed to remove foreign matter and contaminants.

306-2.4.5 Protection of Machined Surfaces. Machined surfaces and shafting shall be kept clean and protected from corrosion by using the type and amount of coating specified in the manufacturer's warranty requirements.

306-2.5 Protection of Pipe Interiors. Completed portions of pipeline shall not be used as a drain for removing water that has infiltrated into the trench. Pipe interiors shall be maintained in a clean condition free from foreign materials until completion of the Work.

For pressure pipe and clean water gravity pipe, pipe ends, fitting ends, valve ends, and equipment openings shall be covered with rubber, plastic, or canvas. Open ends of pressure pipe or clean water gravity pipe with tight-fitting caps or plugs shall be closed when pipe installation is not in progress. These provisions shall apply during work breaks in excess of 40 minutes, as well as overnight.

For potable water pipelines, failure to provide adequate protection will result in the Engineer requiring additional bacteriological testing to be performed in accordance with 306-8.9.4.6.

306-2.6 Compliance with Warranty Instructions. The Contractor shall conform to the submitted operation, maintenance, and warranty instructions. These instructions shall be deemed to be a part of the manufacturer's installation instructions. The Contractor shall perform the Work in such manner that the applicable manufacturer's warranty is not voided by its activities.

306-2.7 Shutdowns of Existing Pipelines.

306-2.7.1 General. All work needed to shut down an existing pipeline for the Contractor will be performed by forces employed by the affected utility owner unless otherwise specified. The Contractor shall not operate valves, hydrants or other appurtenances owned by the affected utility unless otherwise specified.

306-2.7.2 Preparation. The Contractor shall be prepared to employ pumping and dewatering equipment if a watertight seal cannot be achieved by the utility owner or Agency forces using existing valves.

306-2.7.3 Temporary Bypasses. When main shutdowns in excess of 4 hours are required, the utility owner will determine what temporary bypasses or service connections will be required unless specified in the Special Provisions.

The Contractor shall provide and maintain temporary water service. Piping, hoses and associated equipment used shall be flushed and disinfected in accordance with 306-8.9.4.

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306-2.8 Advance Preparation before Connecting to Existing Pipelines. When connections are to be made to any existing pipe, conduit, or other structure or appurtenance, where the Plans require verification, or where the actual elevation, size, material, joint type, or position is not shown on the Plans or cannot be ascertained with certainty without excavation, the Contractor shall excavate for and expose the existing improvement before ordering materials or laying any pipe or conduit.

The Contractor shall provide advance notice to the Engineer and allow a minimum 2-hour window for the Engineer to inspect the existing pipe or conduit before connection materials are ordered. The Contractor shall prepare a sketch of the materials found at the proposed point of connection and submit to the Engineer along with any proposed changes to the specified connection requirements and/or to the lines and grades shown on the Plans. Any resultant changes shall be approved by the Engineer before ordering materials.

306-3 TRENCH EXCAVATION.

306-3.1 General. Pursuant to Section 6500 of the Labor Code, prior to commencing the excavation of a trench 5 feet (1.5 m) in depth or greater and into which a person will be required to descend, the Contractor shall first obtain a permit to do so from the State of California Department of Industrial Relations, Division of Occupational Safety and Health.

Excavation shall include the removal of materials of any nature which interfere with the Work.

Excavation for appurtenant structures, such as but not limited to, manholes, transition structures, junction structures, vaults, valve boxes, catch basins, thrust blocks, and boring pits shall, for the purpose of shoring and bracing, be deemed to be in the category of trench excavation.

306-3.2 Removal of Surface Improvements. Removal of surface improvements shall conform to 401.

306-3.3 Removal and Abandonment of Existing Conduits and Structures. When conduits have been or are proposed to be abandoned and are found to interfere with construction of new conduit, the interfering portion(s) shall be removed and the remaining open portion(s) securely sealed. Where the inside diameter of the existing conduit is 4 feet (1.2 m) or less, the seal shall consist of a wall of concrete not less than 6 inches (150 mm) thick or a wall of brick and mortar 8 inches (200 mm) thick. For larger openings, details of the seal shall be as shown on the Plans. In the case of catch basin connector pipes, the inlet opening to the mainline pipe shall also be sealed.

When a sanitary sewer or storm drain is to be abandoned within specified limits, all structures and appurtenances within said limits shall also be abandoned.

Structures shown on the Plans to be removed shall be removed to the full depth of the structure, including its foundation. Voids resulting from abandoned or removed structures shall be filled with material approved by the Engineer compacted to a relative compaction of 90 percent.

Cover sets, gratings, and other steel components (except reinforcing bars) of removed or abandoned structures shall be salvaged. The Contractor shall contact the component owners and, if requested, shall load such material onto an owner-furnished truck at the Work site. Otherwise, such material shall become the property of the Contractor and shall be disposed of off the Work site.

306-3.4 Minimum and Maximum Pipe Zone Trench Width. For pipe, unless otherwise shown on the Plans, the minimum and maximum trench width measured at the top of the bedding zone located 1 foot (0.3 m) above the crown of the pipe shall be as shown in Tables 306-3.4 (A) and 306-3.4 (B), where D is the nominal pipe diameter.

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TABLE 306-3.4 (A)

Gravity Pipe Material	Applicable Specification	Nominal Pipe Size inches (mm)	Side Clearance, inches (mm)	
			Minimum	Maximum
Vitrified Clay Pipe	306-7.4 and ASTM C12 Section 6	All sizes	6 (150) or as shown on the Plans	As shown on the Plans
Prefabricated Concrete Pipe	306-7.3 and ASTM C1479	Up to and including 36 (900)	6 (150) or as shown on the Plans	D or as shown on the Plans
		Over 36 (900)	D/6 or as shown on the Plans	As shown on the Plans
Cast-in-Place Concrete Pipe	306-9	All sizes	306-9	
Corrugated Metal Pipe	306-7.6	All sizes	8 (200)	As shown on the Plans
Plastic Pipe	ASTM D2321 Paragraph 6.3	Up to and including 16 (400)	8 (200)	12 (300)
		Over 16 (400) to and including 30 (750)	6 (150) + D/8	18 (450)
		Over 30 (750)	As shown on the Plans	

TABLE 306-3.4 (B)

Pressure Pipe Material	Applicable Specification	Nominal Pipe Size inches (mm)	Side Clearance inches (mm)	
			Minimum	Maximum
Ductile Iron Pipe	AWWA C600 Section 4.3.2.3 and AWWA M41	All sizes	12 (300)	As shown on the Plans
Steel Pipe	AWWA C604 Section 4.4.2.3 and AWWA M11	All sizes	6 (150) or as shown on the Plans	As shown on the Plans
Concrete Pressure Pipe	AWWA C604 Section 4.4.2.3 and AWWA M9	All sizes	6 (150) or as shown on the Plans	As shown on the Plans
PVC Pressure Pipe	AWWA C605 AWWA M23	Up to and including 16 (400)	8 (200)	12 (300)
		Over 16 (400) to and including 30 (750)	6 (150) + D/8	18 (450)
		Over 30 (750)	As shown on the Plans	
HDPE Pressure Pipe	AWWA M55	Up to and including 16 (400)	8 (200)	12 (300)
		Over 16 (400) to and including 30 (750)	6 (150) + D/8	18 (450)
		Over 30 (750)	As shown on the Plans	
Fiberglass Pressure Pipe	AWWA M45 Section 6.6	Up to and including 16 (400)	8 (200)	12 (300)
		Over 16 (400) to and including 30 (750)	6 (150) + D/8	18 (450)
		Over 30 (750)	As shown on the Plans	

If the maximum trench width is exceeded, the Contractor shall provide additional bedding, another type of bedding, or a higher strength of pipe as approved by the Engineer.

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306-3.5 Maximum Length of Open Trench. Unless otherwise specified in the Special Provisions or approved by the Engineer, the maximum length of open trench where prefabricated pipe, including field fused/welded pipe, is to be placed shall be 500 feet (150 m) or the distance necessary to accommodate the length of pipe to be installed in a single Day, whichever is greater. This distance shall be defined as the total length at any location of open trench excavation, pipe laying and appurtenant construction, and backfill over which temporary resurfacing has not been placed.

Unless otherwise specified in the Special Provisions or approved by the Engineer, the maximum length of open trench in any one location where concrete structures are cast-in-place shall be that which is necessary to permit uninterrupted progress of the structure construction.

306-3.6 Trench Access Ladders. Ladders for trench access shall be provided for each 50 feet (15 m) of open trench, or fraction thereof, for trenches over 4 feet (1.2 m) in depth. Ladders shall project 2 feet (0.6 m) above the top of the trench and be so located that workers in the trench need not move more than 25 feet (7.5 m) to a ladder.

306-4 SHORING AND BRACING. For the purpose of shoring or bracing, a trench is defined as an excavation in which the depth is greater than the width of the bottom of the excavation.

The manner of bracing excavations shall be as set forth in the rules, orders, and regulations of the Division of Occupational Safety and Health.

The Contractor shall be responsible for the installation and removal of all shoring and bracing materials used during trenching and excavations unless otherwise specified or directed by the Engineer. The Contractor shall be responsible for the repair of all existing damaged utilities and structures.

At locations where the drilling of holes for soldier piles is impracticable because of the existence of rocks, running sand, or other similar conditions, and provided said impracticability is demonstrated to the satisfaction of the Engineer, the Engineer may approve the use of means other than drilling for the purpose of placing the vertical supports. Such other means, however, shall prevent damage to existing surface or subsurface improvements.

If sheeting is used to support an excavated trench, the Contractor shall remove the sheeting, and no such sheeting will be permitted to remain in the trench. When field conditions, the type of sheeting, or methods of construction used by the Contractor are such as to make the removal of sheeting impracticable, the Engineer may permit portions of the sheeting to be cut off to a specified depth and remain in the trench.

306-5 DEWATERING. The Contractor shall install, operate, and maintain a dewatering system of sufficient capacity so as to maintain the trench bedding zone free of standing or ponded water, and in a condition suitable for prosecution and progress of the Work. Unless otherwise specified, dewatering shall conform to 3-12.6.4.

Groundwater shall be allowed to rise to ambient groundwater elevation upon completion of final trench backfill operations to finished grade or subgrade of permanent surfacing. The rate at which groundwater is allowed to rise shall be controlled by the Contractor to assure protection of the Work in conformance with 4-1.

306-6 BEDDING.

306-6.1 General. Bedding material shall conform to 217. Concrete used for bedding shall conform to 201-1. The bedding zone shall be defined as the area containing the material supporting, surrounding the pipe, and extending to 1 foot (300 mm) above the top of the pipe. Where concrete is specified to cover the pipe, the top of the concrete shall be considered the top of the bedding.

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Unless otherwise shown on the Plans, or specified in the Special Provisions or Reference Specifications, the minimum dimensions of bedding material placement shall be as follows:

a) 4 inches (100 mm) below the pipe barrel on ferrous, concrete and clay pipe,

b) 4 inches (100 mm) below the pipe barrel on plastic pipe,

c) 6 inches (150 mm) below the pipe barrel on pipe above a rock foundation,

d) 1 inch (25 mm) below a projecting bell for non-plastic sewer, storm drain and water pipe, and

e) the dimensions shown in Tables 306-3.4 (A) and 306-3.4 (B) from the outermost dimension of each side of the pipe barrel.

Bedding material shall be placed on a firm and unyielding subgrade so the pipe is supported for the full-length of the barrel.

Where it becomes necessary to remove boulders or other interfering objects at subgrade, the resulting voids below such subgrade shall be backfilled with bedding material of the type shown in Table 217-1.2. Soft, spongy, unstable, or other unsuitable material encountered upon which the bedding material or pipe is to be placed shall be removed to the depth directed or approved by the Engineer and replaced with the aforementioned bedding material.

The trench shall be excavated to a depth above the invert grade and the trench bottom hand-shaped so as to provide firm support on undisturbed material for the entire length of the pipe.

Pipe shall bear uniformly on the subgrade or bedding material except for sockets or collars which shall not bear upon the subgrade or bedding material.

306-6.2 Bedding for Narrow Trenches. Narrow trenches shall be defined as trenches 10 inches (250 mm) or less in width.

Bedding requirements for narrow trenches will be specified by the owner of the installation, and shall be placed on firm and unyielding subgrade so as to support the pipe or conduit for its full length. Bedding shall not be jetted unless authorized in writing by the owner of the installation.

When the Contractor is permitted to place the pipe or conduit without bedding, it shall be placed on firm and unyielding subgrade.

306-6.3 Bedding for Plastic Pipe and Fittings. Plastic pipe and fittings shall include the following:

a) ABS solid wall pipe conforming to 207-15.

b) ABS or PVC composite pipe conforming to 207-16.

c) PVC solid wall sewer pipe conforming to 207-17.

d) Annular HDPE pipe conforming to 207-18.

e) PE solid wall drainage pipe conforming to 207-19.

f) FRPM pipe conforming to 207-20.

g) PVC Pressure Pipe conforming to 209-4.

h) Polyethylene (HDPE) Solid-Wall Pressure Pipe conforming to 209-5.

i) Fiberglass pressure pipe conforming to 209-6.

Bedding material for plastic pipe shall conform to 217-1.2.

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306-6.4 Concrete Cradles, Arches, or Encasements When pipe is laid in a sheeted trench, sheeting against which a concrete cradle, arch or encasement is to be placed shall be faced with at least one thickness of building paper and the sheeting shall be withdrawn without displacing or damaging the cradle, except as otherwise specified in 306-4.1.

306-6.5 Placement and Compaction.

306-6.5.1 General. The material in the bedding zone shall be placed and compacted either mechanically or by jetting. Unless the sheeting or shoring is to be cut off and left in place, compaction of bedding material for pipe shall be performed after the sheeting or shoring has been removed form the bedding zone, and prior to the placement of backfill.

Mechanical compaction shall conform to 306-12.3.

Jetting shall conform to 306-12.4 except each lift of bedding material shall not exceed 4 feet (1.2 m) in thickness. The jet pipe shall be of sufficient length to reach within 2 feet (0.6 m) of the bottom of the pipe. Jetting shall provide enough water to thoroughly saturate and compact, without voids, the bedding material around the pipe. The jet pipe shall be inserted at intervals of 3 feet (1 m) maximum, contiguous along each side of the pipe. Neither flooding, nor free standing water will be permitted.

306-6.5.2 Plastic Pipe and Fittings. Bedding material shall be placed as shown on the Plans, or specified in the Special Provisions or Reference Specifications. Crushed rock bedding material shall be placed by slicing, shovel-spading, or shovel rodding to ensure complete filling of the haunch areas below the pipe. No minimum relative compaction requirement shall apply to crushed rock.

306-7 PREFABRICATED GRAVITY PIPE.

306-7.1 General. Prefabricated gravity pipe shall include pipe installations where:

a) no portion of the system (excluding siphons) is designed to operate under continuous pressure, and
b) pipes are designed to drain by gravity in a downhill direction.

Installation of pipeline materials, fittings, and appurtenances shall conform to the requirements shown in Table 306-7.1.

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TABLE 306-7.1

Gravity Pipe Material	Material Specification	Installation Specification
Nonreinforced Concrete Pipe (NRCP)	207-1	306-7.2
Reinforced Concrete Pipe (RCP)	207-2	306-7.3
Lined Reinforced Concrete Pipe	207-3	306-7.3
Vitrified Clay Pipe (VCP)	207-8	306-7.4
Cast Iron Soil Pipe	207-9	306-7.5 California Plumbing Code[1]
Corrugated Steel Pipe	207-11	306-7.6
Structural Steel Plate Pipe and Arches	207-12	306-7.6
Corrugated Aluminum Pipe	207-14	306-7.6
Structural Aluminum Plate Pipe and Arches	207-12	306-7.6
ABS Solid Wall Pipe	207-15	306-7.7
ABS or PVC Composite Pipe	207-16	306-7.7
PVC Plastic Sewer Pipe	207-17	306-7.7
Annular HDPE Pipe with Smooth Interior and Corrugated Exterior	207-18	306-7.7
Polyethylene (HDPE) Solid-Wall Pipe	207-19	306-7.7
FRPM Pipe	207-20	306-7.7
Profile Polypropylene Pipe	207-25	306-7.7
Valves, Manholes, Waterstops, and Appurtenances	212	Manufacturer's installation instructions[2]

1. Submit to the Engineer in accordance with 3-8.4.
2. Any conflicts or discrepancies between the installation specifications shown above and the manufacturer's installation instructions shall be brought to the attention of the Engineer in writing for resolution prior to the start of pipe installation.

Gravity pipe shall be laid to the lines and grades shown on the Plans. The socket or collar ends of the pipe shall be laid upgrade unless otherwise shown on the Plans or approved by the Engineer.

Gravity pipe shall be laid and jointed such that the offset of the inside of the pipe at any joint is held to a minimum at the invert. The maximum offset at the invert of pipe shall be 1 percent of the inside diameter of the pipe or 3/8 inch (9.5 mm), whichever is smaller. In joining socket-and-spigot pipe, the spigot shall be so seated in the socket of the adjacent pipe as to provide a minimum of 3/8 inch (9.5 mm) annular space around the circumference of the pipe in the socket. Offsets shall be distributed around the circumference of the pipe in such a manner that the minimum offset occurs at the invert.

After the joints have been constructed, the pipe shall not be disturbed.

At the close of work each Day, or whenever the work ceases for any reason, the end of the pipe shall be securely closed unless otherwise approved by the Engineer.

306-7.2 Non-Reinforced Concrete Pipe (NRCP).

306-7.2.1 General. NRCP shall conform to 207-1.

306-7.2.2 Tongue and Groove Self-Centering Joints. Tongue and groove self-centering joints shall conform to 306-7.3.2.1.

306-7.2.3 Mortar Joints. The entire annular space shall be completely and compactly filled with Class "C" mortar.

Mortar placed in the joint to assist in the assembling and centering of the pipe shall not be considered to fill that portion of the joint in which it is placed. The mortar shall be beveled on a 1:1 slope from the outer socket edge, and the interior of the pipe cleaned of surplus mortar or other foreign material and neatly wiped.

When approved by the Engineer, a gasket of material approved by the Engineer may be caulked into joints in wet trenches, after which the mortar shall be placed therein.

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306-7.2.4 Gasket-Type Joints. Gasket-type joints shall conform to 306-7.3.2.3.

306-7.2.5 Acceptance Testing. NRCP shall successfully pass the following tests prior to completion of the Work:

TABLE 306-7.2.5

Item	Test For	Test Standard Reference
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	207-1
Installed NRCP	Allowable Cracking	Table 207-2.9.2
	Joint Offset Tolerances	306-7.1
	Pressure Testing and Leakage Inspection of Gravity Pipelines	306-7.8.2
	11-Month Anniversary Warranty Inspection	306-8.9.6

306-7.3 Reinforced Concrete Pipe (RCP).

306-7.3.1 General. Circular RCP with elliptical reinforcement shall be laid with the minor axis of the reinforcement cage in the vertical position. The minor axis shall be marked by the manufacturer with a 4-inch-high (100 mm) "T". RCP shall be laid with the socket end upgrade starting at the downgrade end of the line. Plastic liner installation shall conform to 311-1.

306-7.3.2 Joints.

306-7.3.2.1 Tongue and Groove Self-Centering Joints. Each joint shall be cleaned with a wire brush and wetted before mortaring. Mortar shall be Class "C" conforming to 201-5.

Mortaring of outside joints will not be required except where RCP is used on curves unless otherwise specified in the Special Provisions or shown on the Plans.

RCP installed along curves shall have one or both ends beveled or be pulled to provide a smooth curve. If the extreme ends do not overlap, and the resulting clear space between the extreme ends does not exceed 1 inch (25 mm), the space shall be filled with Class "C" mortar for the full-thickness of the pipe wall. If the clear space between the extreme ends is more than 1 inch (25 mm) but less than 3 inches (75 mm), the joint shall be covered using Class 520-C-2500 (310-C-17) concrete to a minimum depth of 6 inches (150 mm) for a width of 15 inches (380 mm) centered about the joint. Such concrete cover shall be placed from the bottom of the pipe to a point where the extreme ends overlap. Sandbags or dirt sacks may be used as side forms. The inside of the joint shall be mortared as specified above. If the clear space between the extreme ends is 3 inches (75 mm) or greater, but less than 6 inches (150 mm), a concrete collar is required. If the clear space is 6 inches (150 mm) or greater, a transition structure is required. Concrete collars and transition structures shall conform to the details shown on the Plans.

When RCP is under 24 inches (600 mm) in diameter, the outer joint space shall be filled with mortar.

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When RCP is 24 inches (600 mm) or greater in diameter, the interior annular space of each joint shall be filled full-depth with mortar, a smooth, troweled finish applied, and excess mortar removed. The jointing procedure shall be as follows:

a) When the entire trench is to be jetted, no joints shall be mortared before the next 2 joints in advance are laid. However, the mortaring of joints shall be completed before the beginning of jetting.
b) When the entire trench is to be compacted mechanically, no interior joints shall be mortared until compaction has been completed. Joints shall then be mortared.
c) Where the lower portion of the trench is to be jetted and the remainder mechanically compacted, joints shall be mortared in 2 separate operations. Before jetting is begun, mortar shall be pressed into interior joints to within 1 inch (25 mm) of the inside surface. After jetting and mechanical compaction have both been completed, the interior joints shall be cleaned and completed.
d) For gravity sewer pipe, the top half of the outside joint shall be filled with mortar by means of troweling or wiping prior to placement of backfill, and the inside joints shall be completed as specified herein.

306-7.3.2.2 Collar Joints. RCP with collar joints shall be laid with the collar end up-grade. The pipes shall be butted together and a uniform caulking space left between the pipe length and the collar. When the entering pipe length has been laid and checked for line and grade, the pipe length shall be backfilled on both sides. The caulking space shall then be filled with mortar tamped using a caulking tool and hammer.

306-7.3.2.3 Gasket-Type Joints. Gasket-type joints shall be watertight and flexible. Each joint shall contain a gasket conforming to 208-3 unless otherwise shown on the Plans or specified in the Special Provisions. This gasket shall be the sole element responsible for watertightness of the joint. The slope of the longitudinal gasket contact surfaces of the joint with respect to the longitudinal axis of the pipe shall not exceed 2 degrees.

The length and cross-sectional dimension of the gasket, the annular space provided for the gasket, and other joint details shall produce a watertight, flexible joint after installation.

For O-ring type gaskets, prior to placing the spigot into the socket of the pipe previously laid, the spigot groove, the gasket, and the first 2 inches (50 mm) of the inside surface of the socket shall be thoroughly cleaned, then lubricated with a soft vegetable soap compound approved by the Engineer.

The gasket, after lubrication, shall be uniformly stretched when being placed in the spigot groove.

For pipe in which the inside joints are to be pointed, spacers shall be placed against the inside shoulder of the socket to provide the proper space between abutting ends.

For profile-type gaskets, the manufacturer's requirements for lubrication and assembly shall be followed.

After the joint is assembled, a metal feeler gauge shall be inserted between the socket and the spigot and the position of the gasket checked around the complete circumference of the pipe. If the gasket is not in the proper position, the pipe shall be withdrawn from the joint, the gasket checked to see that it is not cut or damaged, the pipe re-inserted and re-bedded, and the gasket position re-checked.

Where steel joint rings are used, a cloth, plastic, or paper band shall be placed around the outside of the pipe and centered over the joint to prevent dirt from entering the joint recess.

The joint band shall be bound to the pipe by the use of steel box strapping or other method approved by the Engineer, and shall completely and tightly encase the outside joint except for an opening near the top

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where grout is to be poured into the joint recess. Grout shall be poured and allowed to set before densification of bedding and backfill material by jetting begins. In any case, joints shall be grouted before backfill is placed over the top of the pipe. With the jointing band properly secured, the joint recess shall be moistened with water and then filled with Class "C" mortar. Mortar shall completely fill the outside annular space between the ends of the pipe and around the circumference. After the recess has been filled, the jointing band shall be replaced over the opening left for pouring and the mortar allowed to set. After the bedding and backfill material have been densified, the inside joint recess shall first be moistened with water, then filled with stiff class "C" mortar. The finished joint shall be smooth and flush with the adjacent pipe surfaces.

306-7.3.3 Acceptance Testing. RCP shall successfully pass the following tests prior to completion of the Work:

TABLE 306-7.3.3

Item	Test For	Test Standard Reference
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	207-2 or 207-3 as applicable
Installed RCP	Allowable Cracking	Table 207-2.9.2
	Joint Offset Tolerances	306-7.1
	Pressure Testing and Leakage Inspection of Gravity Pipelines	306-7.8.2
	11-Month Anniversary Warranty Inspection	306-8.9.6

306-7.4 Vitrified Clay Pipe (VCP).

306-7.4.1 General. VCP shall be "extra strength" or "high strength" as shown on the Plans or specified in the Special Provisions.

306-7.4.2 Installation.

306-7.4.2.1 General. Unless otherwise shown on the Plans or specified in the Special Provisions, any of the following joints may be used.

306-7.4.2.2 Type "D" Joints (Rubber-Sleeve Coupling with Shear Ring for Plain-End Clay Pipe). Type "D" joints shall conform to 208-2.2. Unless otherwise specified in the Special Provisions, pipe shall be delivered to the Work site with the rubber sleeve and shear ring installed on one end of the pipe or fitting. Before installing compression bands, the surface of the rubber sleeve shall be thoroughly wetted with a silicone-based lubricant. The lubricant shall not be detrimental to the sleeve, stainless steel bands, or plastic shear ring. Joints installed on pipe at the manufacturing plant shall have compression bands torqued to 70 inch-pounds (8 N-m), minimum. When joints are installed in the field, the plain end of the pipe to be joined shall be inserted into the sleeve and the compression bands torqued to 70 inch-pounds (8 N-m), minimum, and shall provide uniform tension. Type "D" Joints may be used on pipe on curves in accordance with 306-7.4.2.4.

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306-7.4.2.3 Type "G" Joints (Polyurethane Compression). Type "G" joints shall conform to 208-2.3.

Prior to jointing, the matting surfaces shall be cleaned and lubricated with a lubricant recommended by the pipe manufacturer and approved by the Engineer. Pipe shall be joined spigot into socket. When jointing is completed, joints shall be within the tolerance shown in Table 306-7.4.2.3.

TABLE 306-7.4.2.3

Pipe Size inches (mm)	Joint Space inches (mm)
15 - 18 (375 - 450)	5/8 (16)
21 - 42 (525 - 1050)	7/8 (22)

The joint space shall not be increased because of deflections along curved sections. Straight pipe with Type "G" joints may be used on pipe on curves in accordance with 306-7.4.2.4.

306-7.4.2.4 Straight Non-Beveled Pipe On Curves. Straight nonbeveled pipe with Type "D" or Type "G" joints may be used along curves, provided the radius of curvature is not less than that shown in Table 306-7.4.2.4 (A). For a radius of curvature less than that shown, beveled pipe or shorter pipe lengths shall be used.

TABLE 306-7.4.2.4 (A)

D Pipe Size inches (mm)	For Pipe Length ft (m)	Min. Radius of Curvature ft (m)	Max. Deflection Per Joint (degrees)	Max. Deflection Per Length inches (mm)
6 to 12 (150 to 300)	5 (1.5)	120 (37)	2.4	2-1/2 (63)
	5-1/2 (1.7)	132 (40)	2.4	2-3/4 (70)
	6 (1.8)	144 (44)	2.4	3 (76)
15 to 24 (375 to 600)	5 (1.5)	160 (49)	1.8	1-7/8 (47)
	5-1/2 (1.7)	176 (54)	1.8	2-1/16 (52)
	6 (1.8)	192 (59)	1.8	2-1/4 (57)
	7-1/2 (2.3)	240 (73)	1.8	2-13/16 (71)
27 to 36 (675 to 900)	5 (1.5)	240 (73)	1.2	1-1/4 (31)
	5-1/2 (1.7)	264 (80)	1.2	1-3/8 (34)
	6 (1.8)	288 (88)	1.2	1-1/2 (38)
	7-1/2 (2.3)	360 (110)	1.2	1-7/8 (47)
39 to 42 (975 to 1050)	5 (1.5)	320 (97)	0.9	15/16 (23)
	5-1/2 (1.7)	352 (107)	0.9	1-1/16 (27)
	6 (1.8)	384 (117)	0.9	1-1/8 (28)

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For pipe lengths not shown in Table 306-7.4.2.4 (A), the requirements shown in Table 306-7.4.2.4 (B) shall be applicable.

TABLE 306-7.4.2.4 (B)

D Pipe Size inches (mm)	Maximum Allowable Deflection Δd inches per ft (mm per m) of pipe	Equation for Minimum Radius of Curvature (L = Pipe Length)
6 to 12 (150 to 300)	1/2 (42)	r = 24L
15 to 24 (375 to 600)	3/8 (31)	r = 32L
27 to 36 (675 to 900)	1/4 (21)	r = 48L
39 to 42 (975 to 1050)	3/16 (16)	r = 64L

306-7.4.3 Acceptance Testing. VCP shall successfully pass the following tests prior to completion of the Work:

TABLE 306-7.4.3

Item	Test For	Test Standard Reference
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	207-8
VCP	Joint Offset Tolerances	306-7.1
	Pressure Testing and Leakage Inspection of Gravity Pipelines	306-7.8.2
	11-Month Anniversary Warranty Inspection	306-8.9.6

306-7.5 Cast Iron Soil Pipe.

306-7.5.1 General. The type of joint to be installed shall be as shown on the Plans or specified in the Special Provisions. If not designated, the type of joint may be any of the following.

306-7.5.2 Installation.

306-7.5.2.1 Cement Joints. Cement joints shall consist of a gasket of untarred jute or oakum twisted into a rope of approximately the same diameter as the joint space and saturated with neat cement grout driven against the base of the socket. After placement, caulking cement shall be pushed into the socket with a steel caulking tool until the interior of the socket is completely filled, then thoroughly tamped with a caulking tool. The joint shall then be beveled off from the outer edge of the socket to the sides of the pipe. Completed joints shall be protected from the sun immediately following caulking.

306-7.5.2.2 Slip-On Joints. The gasket and gasket seal inside the socket shall be wiped clean before the gasket is inserted. A thin film of soft vegetable soap compound shall be applied to the gasket and the outside of the spigot end of the pipe. The spigot shall then be positioned inside the socket and pushed into place. Any lubricant other than that furnished with the pipe shall not be used unless otherwise approved by the Engineer.

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306-7.5.3 Acceptance Testing. Cast iron soil pipe shall successfully pass the following tests prior to completion of the Work:

TABLE 306-7.5.3

Item	Test For	Test Standard Reference
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	207-9
Installed Cast Iron Soil Pipe	Pressure Testing and Leakage Inspection of Gravity Pipelines	306-7.8.2
	11-Month Anniversary Warranty Inspection	306-8.9.6

306-7.6 Corrugated Metal Pipe (CMP).

306-7.6.1 General. CMP shall include corrugated steel pipe and corrugated aluminum pipe. Installation of pipe arches shall be as shown on the Plans or specified in the Special Provisions.

306-7.6.2 Installation. Pipe sections shall be laid with a maximum spacing between sections of 1-1/2 inches (38 mm). Annular CMP shall be laid with external laps of the circumferential seams or circumferential joints upgrade. Pipe coupling corrugations or projections shall properly engage the pipe sections before bolts are tightened. Where pipe and/or couplings and pipe and/or couplings with metallic coatings are joined with dissimilar metals, the contact points shall be coated with asphalt mastic conforming to 207-11.5.2.

Corrugated aluminum pipe and aluminized corrugated steel pipe shall not come into contact with reinforcing steel or structural steel members. Corrugated aluminum pipe and aluminized corrugated steel pipe shall be coated with asphalt mastic conforming to 207-11.5.2 where concrete or trench backfill slurry is required or where the pipe is to be embedded in concrete.

Paved inverts shall be placed and centered on the bottom of the trench. Any damage to the protective lining and coating shall be repaired prior to backfilling.

When so specified in the Special Provisions, circular corrugated steel pipe shall be elongated in the shop or in the field before backfilling. The pipe shall be vertically elongated from a true circle to provide an increase in the diameter of approximately 5 percent for the full length.

Watertight joints, when shown on the Plans or specified in the Special Provisions, shall conform to 207-11.2.2.

Corrugated steel pipe installation shall conform to ASTM A798 Section 8.

Corrugated steel plate pipe and arch installation shall conform to ASTM A807 Section 8.

Corrugated aluminum pipe installation shall conform to ASTM B788.

Corrugated aluminum plate pipe and arch installation shall conform to ASTM B789.

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306-7.6.3 Acceptance Testing. CMP shall successfully pass the following tests prior to completion of the Work:

TABLE 306-7.6.3

Item	Test For	Test Standard Reference
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	207-11, 12, 13, or 14 as appropriate
Installed CMP	Barrel Deflection	306-7.8.3
	Leakage Test	306-7.8.2
	11-Month Warranty Inspection	306-8.9.6

306-7.7 Plastic Sewer and Drainage Pipe.

306-7.7.1 General. Plastic pipe and fittings shall be defined as including the following:

a) ABS solid wall pipe conforming to 207-15,

b) ABS or PVC composite pipe conforming to 207-16,

c) PVC gravity pipe conforming to 207-17,

d) Annular HDPE pipe conforming to 207-18,

e) PE solid wall pipe conforming to 207-19,

f) FRPM pipe conforming to 207-20, and.

g) Profile Polypropylene Pipe conforming to 207-25.

Connections of pipe and fittings to a manhole shall be watertight. The use of manhole waterstops shall be approved by the Engineer. Pipe may be used on curves only if deflection fittings or couplings are used, or if solid wall pipe is bent without any application of heat. If deflection fittings or couplings are proposed for use on curves, the proposed alignment and method of joining shall be submitted to the Engineer in accordance with 3-8.4.

306-7.7.2 Installation.

306-7.7.2.1 Solvent-Welded ABS and PVC Pipe. Solvent cement shall conform to 207-15.1 for ABS pipe and 207-17.3.3 for PVC pipe.

The spigot end of the pipe shall be inserted to the proper depth of the socket as indicated by the "home mark."

306-7.7.2.2 Gasket-Type ABS, CHDPE, PVC Pipe, and Profile Polypropylene Pipe. Gaskets shall conform to 208-4.

The spigot end shall be inserted to the proper depth of the socket as indicated by the "home mark." The home mark shall be shown as a circumferential line or by the words "home mark" on the outside of the pipe. The home mark shall be clearly and permanently indicated on the spigot end of the pipe by the manufacturer at the factory.

306-7.7.2.3 Jointing of Injection-Sealed PVC Pipe. The spigot end shall be inserted to the full-depth of the socket as indicated by the "home mark" and driven into the locking taper as recommended by the manufacturer.

The ports in the socket end shall be positioned to allow observance of flow of the adhesive compound from the exhaust port. The adhesive compound shall be injected until air is no longer

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observed to bubble from the exhaust port. Escape of adhesive compound beyond the retainer ring shall be cause for rejection of the joint.

306-7.7.3 Acceptance Testing. Plastic sewer and drainage pipe shall successfully pass the following tests prior to completion of the Work:

TABLE 306-7.7.3

Item	Test For	Test Standard Reference
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	207-15, 16, 17, 18, 19, or 20 as appropriate
Installed Plastic Sewer and Drainage Pipe	Barrel Deflection	306-7.8.3
	Pressure Testing and Leakage Inspection of Gravity Pipelines	306-7.8.2
	11-Month Anniversary Warranty Inspection	306-8.9.6

306-7.8 Gravity Pipeline Testing.

306-7.8.1 General. Gravity pipeline testing shall include pressure testing, leakage inspection, and barrel deflection testing.

306-7.8.2 Pressure Testing and Leakage Inspection .

306-7.8.2.1 General. Leakage tests and post-installation closed circuit television (CCTV) inspections shall be completed and approved prior to placing permanent resurfacing.

When leakage or infiltration exceeds the amount allowed by the Specifications, the Contractor shall locate the leaks and make the necessary repairs or replacements in conformance with the Specifications to reduce the leakage or infiltration to the specified limits. Individual detectable leaks shall be repaired regardless of the results of the tests. Leakage tests shall be performed on completed pipelines as follows:

a) Storm Drains: Not required unless shown on the Plans or specified in the Special Provisions.

b) Gravity Sanitary Sewers 24 inches (600 mm) or less in diameter where the difference in elevation between inverts of adjacent manholes is 10 feet (3 m) or less: Water exfiltration test or water infiltration test as specified in the Special Provisions. The Engineer may allow substitution of an air pressure test for the water exfiltration test.

c) Gravity Sanitary Sewers 24 inches (600 mm) or less in diameter where the difference in elevation between inverts of adjacent manholes is greater than 10 feet (3 m): Air pressure test or water infiltration test as specified in the Special Provisions.

d) Gravity Sanitary Sewers 24 inches (600 mm) or greater in diameter: Air pressure test or water infiltration test as specified in the Special Provisions.

e) Gravity Sanitary Sewers which are in service and a bypass system is not available: The Contractor shall perform post-installation CCTV inspection in accordance with 500-1.1.5.

306-7.8.2.2 Water Exfiltration Test. Each section of sewer shall be tested between successive manholes by closing the lower end of the sewer to be tested and the inlet sewer of the upper manhole with stoppers. The pipe and manhole shall be filled with water to a point 4 feet (1.2 m) above the invert of the sewer at the center of the upper manhole; or if groundwater is present, 4 feet (1.2 m) above the average adjacent groundwater level.

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The allowable leakage will be computed by the formulae:

$E_{US} = 0.0001\ LD\ \sqrt{H}$ for mortared joints.

($E_{SI} = 0.00009\ LD\ \sqrt{H}$ for mortared joints)

$E_{US} = 0.00002\ LD\ \sqrt{H}$ for all other joints.

($E_{SI} = 0.000018\ LD\ \sqrt{H}$ for all other joints.)

Where:

L = length of sewer and house connections tested, in feet (meters).

E_{US} (E_{SI}) = the allowable leakage in gallons (liters) per minute of sewer tested.

D = the internal diameter of the pipe in inches (mm).

H = is the difference in elevation feet (meters) between the water surface in the upper manhole and the invert of the pipe at the lower manhole; or if groundwater is present above the invert of the pipe in the lower manhole, the difference in elevation between the water surface in the upper manhole and the groundwater at the lower manhole.

Unless otherwise specified, the Contractor shall furnish the water, labor, and equipment necessary and perform the required tests. Tests shall be performed in the presence of the Engineer.

306-7.8.2.3 Water Infiltration Test. If, in the opinion of the Engineer, excessive groundwater is encountered during the construction of a section of a sewer, the exfiltration test for leakage shall not be used.

The end of the sewer at the upper structure shall be closed sufficiently to prevent the entrance of water, and pumping of groundwater shall be discontinued for at least 3 Days, after which the section shall be tested for infiltration.

The infiltration into each individual reach of the sewer between adjoining manholes shall not exceed that allowed by the formula specified in 306-7.8.2.1 where H is the difference in the elevation in feet (meters) between the groundwater surface and the invert of the sewer at the downstream manhole.

306-7.8.2.4 Air Pressure Test. Air test equipment shall be approved by the Engineer unless otherwise shown on the Plans or specified in the Special Provisions.

The Contractor may conduct an initial air test of the sewer mainline after compaction of the backfill, but prior to installation of the house connection sewers. Such tests will be considered to be for the Contractor's convenience and need not be performed in the presence of the Engineer.

Each section of sewer shall be tested between successive manholes by plugging and bracing all openings in the sewer mainline and the upper ends of all house connection sewers. Prior to any air pressure testing, pipe plugs shall be checked with a soap solution to detect any air leakage. If any leaks are found, the air pressure shall be released, the leaks eliminated, and the test procedure started over again. The Contractor may, at its option, wet the interior of the pipe prior to the test.

The final leakage test of the sewer mainline and branching house connection sewers shall be conducted in the presence of the Engineer in the following manner:

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Air shall be introduced into the pipeline until 30 pounds per square inch (210 kPa) gauge pressure has been reached, at which time the flow of air shall be reduced and the internal air pressure shall be maintained between 2.5 and 3.5 pounds per square inch (17 kPa and 24 kPa) gauge pressure for at least 2 minutes to allow the air temperature to come to equilibrium with the temperature of the pipe walls. Pressure in the pipeline shall be constantly monitored by a gauge and hose arrangement separate from the hose used to introduce air into the line. Pressure in the pipeline shall not be allowed to exceed 5 pounds per square inch (34 kPa) gauge pressure.

After the temperature has stabilized and no air leaks at the plugs have been found, the air pressure shall be permitted to drop and, when the internal pressure has reached 2.5 pounds per square inch (17 kPa) gauge pressure, a stopwatch or sweep-second-hand watch shall be used to determine the time lapse required for the air pressure to drop to 1.5 pounds per square inch (10 kPa) gauge pressure.

If the time lapse (in seconds) required for the air pressure to decrease from 2.5 to 1.5 pounds per square inch (17 to 10 kPa) gage pressure exceeds that shown in Table 306-7.8.2.4, the pipe shall be presumed to be within the acceptance limits for leakage.

If the time lapse is less than that shown in the table, the Contractor shall make the necessary corrections to reduce the leakage to the acceptance limits.

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TABLE 306-7.8.2.4

Time in Seconds for Pressure to Drop from 2.5 to 1.5 pounds per square inch (17 to 10 kPa) Gauge Pressure

Main Line	4-inch (100 mm) House Connection						Main Line	6-inch (150 mm) House Connection					
Nominal Diameter inches (mm)	Length ft (m)	House Connection Length					Nominal Diameter inches (mm)	Length ft (m)	House Connection Length				
		0 ft (0 m)	100 ft (30 m)	200 ft (60 m)	300 ft (90 m)	400 ft (120 m)			0 ft (0 m)	100 ft (30 m)	200 ft (60 m)	300 ft (90 m)	400 ft (120 m)
8 (200)	0 (0)	0	20	40	50	70	8 (200)	0 (0)	0	40	80	100	100
	50 (15)	40	50	70	90	80		50 (15)	40	70	110	110	110
	100 (30)	70	90	100	100	90		100 (30)	70	110	120	110	110
	150 (45)	110	120	110	100	100		150 (45)	110	120	120	120	110
	200 (60)	140	120	110	110	100		200 (60)	140	130	120	120	120
	300 (90)	140	130	120	110	110		300 (90)	140	130	120	120	120
	400 (120)	140	130	120	120	110		400 (120)	140	130	130	120	120
10 (250)	50 (15)	50	70	90	100	90	10 (250)	50 (15)	50	90	120	120	110
	100 (30)	110	130	120	110	110		100 (30)	110	140	130	130	120
	150 (45)	170	150	140	130	120		150 (45)	170	150	140	140	130
	200 (60)	170	160	150	140	130		200 (60)	170	160	150	140	140
	300 (90)	170	160	150	150	140		300 (90)	170	160	150	150	140
12 (300)	50 (15)	80	100	110	110	110	12 (300)	50 (15)	80	120	140	130	120
	100 (30)	160	170	150	140	130		100 (30)	160	170	150	140	140
	150 (45)	200	180	170	160	150		150 (45)	200	180	170	160	150
	200 (60)	200	190	180	170	160		200 (60)	200	190	180	170	160
	300 (90)	200	190	180	180	170		300 (90)	200	190	180	180	170
15 (375)	50 (15)	120	140	160	140	130	15 (375)	50 (15)	120	160	160	150	140
	100 (30)	250	220	190	170	160		100 (30)	250	210	190	170	160
	150 (45)	260	230	220	200	190		150 (45)	260	230	210	200	190
	200 (60)	260	240	230	220	210		200 (60)	260	240	220	210	200
	300 (90)	260	240	230	220	220		300 (90)	260	240	230	220	210
18 (450)	50 (15)	180	200	190	170	150	18 (450)	50 (15)	180	220	190	170	160
	100 (30)	310	260	230	210	190		100 (30)	310	260	220	200	190
	150 (45)	310	280	260	250	230		150 (45)	310	280	260	240	220
	200 (60)	310	290	280	260	250		200 (60)	310	290	270	260	240
	300 (90)	310	290	280	270	260		300 (90)	310	290	280	270	260
21 (525)	50 (15)	240	260	230	200	180	21 (525)	50 (15)	240	260	220	200	180
	100 (30)	360	310	280	250	230		100 (30)	360	300	260	240	200
	150 (45)	360	330	310	290	280		150 (45)	360	330	300	280	260
	200 (60)	360	340	320	310	300		200 (60)	360	330	320	300	290
	300 (90)	360	340	330	320	310		300 (90)	360	340	330	310	300
24 (600)	50 (15)	320	320	270	240	210	24 (600)	50 (15)	320	310	260	220	200
	100 (30)	410	360	320	290	270		100 (30)	410	350	310	280	260
	150 (45)	410	380	360	340	320		150 (45)	410	370	350	320	310
	200 (60)	410	390	370	360	350		200 (60)	410	380	360	350	330
	300 (90)	410	390	380	370	360		300 (90)	410	390	370	360	350
27 (675)	50 (15)	400	370	310	280	250	27 (675)	50 (15)	400	350	290	260	230
	100 (30)	460	410	370	340	310		100 (30)	460	390	350	320	290
	150 (45)	460	430	410	390	370		150 (45)	460	420	390	370	350
	200 (60)	460	440	420	410	390		200 (60)	460	430	410	390	380
	300 (90)	460	450	430	420	410		300 (90)	460	440	420	410	390

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TABLE 306-7.8.2.4 *(Continued)*

Time in Seconds for Pressure to Drop from 2.5 to 1.5 pounds per square inch (17 to 10 kPa) Gauge Pressure

Main Line	4-inch (100 mm) House Connection						Main Line	6-inch (150 mm) House Connection					
Nominal Diameter inches (mm)	Length ft (m)	House Connection Length					Nominal Diameter inches (mm)	Length ft (m)	House Connection Length				
		0 ft (0 m)	100 ft (30 m)	200 ft (60 m)	300 ft (90 m)	400 ft (120 m)			0 ft (0 m)	100 ft (30 m)	200 ft (60 m)	300 ft (90 m)	400 ft (120 m)
30 (750)	50 (15)	490	420	360	310	280	30 (750)	50 (15)	480	490	330	290	260
	100 (30)	510	460	420	380	360		100 (30)	510	440	390	360	330
	150 (45)	510	480	460	440	420		150 (45)	510	470	440	420	390
	200 (60)	510	490	470	460	440		200 (60)	510	480	460	440	420
	300 (90)	510	500	480	470	460		300 (90)	510	490	470	460	440
33 (825)	50 (15)	560	460	400	350	320	33 (825)	50 (15)	560	440	370	320	290
	100 (30)	560	510	460	430	400		100 (30)	560	490	440	400	370
	150 (45)	560	530	510	490	460		150 (45)	560	520	490	460	440
	200 (60)	560	540	520	510	490		200 (60)	560	530	510	490	470
	300 (90)	560	550	530	520	510		300 (90)	560	540	520	510	490
36 (900)	50 (15)	610	510	440	390	360	36 (900)	50 (15)	610	480	410	360	320
	100 (30)	610	560	510	480	440		100 (30)	610	540	480	440	410
	150 (45)	610	580	560	530	510		150 (45)	610	570	540	510	480
	200 (60)	610	600	580	560	540		200 (60)	610	590	560	540	520
	300 (90)	610	600	580	570	560		300 (90)	610	590	570	560	540
39 (975)	50 (15)	660	560	490	440	390	39 (975)	50 (15)	660	530	450	390	350
	100 (30)	660	610	560	520	490		100 (30)	660	590	530	480	450
	150 (45)	660	630	610	580	560		150 (45)	660	620	590	560	530
	200 (60)	660	640	620	610	590		200 (60)	660	640	610	590	570
	300 (90)	660	650	630	620	610		300 (90)	660	640	620	610	590
42 (1050)	50 (15)	710	610	540	480	430	42 (1050)	50 (15)	710	580	490	430	390
	100 (30)	710	660	610	570	540		100 (30)	710	640	580	530	490
	150 (45)	710	680	660	630	610		150 (45)	710	670	640	610	580
	200 (60)	710	690	680	660	640		200 (60)	710	690	660	640	620
	300 (90)	710	700	680	670	660		300 (90)	710	690	670	650	640

306-7.8.2.5 Leakage Test for Corrugated Metal Pipelines. After the pipe has been laid and assembled, and when required, the pipeline shall be filled with water to a hydrostatic pressure head of 10 feet (3.0 m) above the point in the line to be tested.

A hydrostatic test shall be conducted for a period of not less than 24 hours, during which time an accurate measure of the water required to maintain the test pressure shall be made. Any leakage developed by the test shall not exceed 0.60 gallon per inch (90 mL/mm) of inside diameter per 100 feet (30 m) of pipe per hour. Any leakage in excess of this amount shall be stopped in a manner accepted by the Engineer, and the test repeated until the total leakage does not exceed the amount specified. All obvious leaks shall be stopped in a manner accepted by the Engineer, whether or not the leakage from the line exceeds that permitted herein.

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306-7.8.3 Maximum Allowable Barrel Deflection Testing of Plastic Sewer and Storm Drain Pipe.

306-7.8.3.1 General. Pipe and fittings shall be tested to ensure vertical deflections and measured diameter do not exceed the maximum allowable barrel deflection. The maximum allowable barrel deflection as a percentage of the nominal pipe internal diameter shall conform to the requirements shown in Table 306-7.8.3.1.

TABLE 306-7.8.3.1

Nominal Pipe Diameter		Percentage Barrel Deflection Allowed[1,2]				
		Sewer Pipe			Storm Drain	
Inches	Millimeters	ABS or PVC Composite	ABS, FRPM, HDPE or PVC Solid-wall or CHDPE	Clay, Concrete or DIP	ABS, PVC, FRPM, CMP, HDPE or composite	Clay, Concrete or DIP
0 through 12	0 through 300	3.0%	5.0%	n/a	6.5%	n/a
Over 12 through 30	Over 300 through 750	3.0%	4.0%	n/a	6.5%	n/a
Over 30 through 60	Over 750 through 1500	n/a	3.0%	n/a	6.5%	n/a
Over 60 through 90	Over 1500 through 2250	n/a	2.5%	n/a	6.5%	n/a
Over 90 through 120	Over 2250 through 3000	n/a	2.0%	n/a	6.5%	n/a
Over 120	Over 3000	n/a	1.5%	n/a	6.5%	n/a

1. 30 Days after installation.
2. Deflection tests shall not be performed sooner than 30 Days after completion of placement and compaction of backfill. The pipe and fittings shall be cleaned and inspected for offsets and obstructions prior to testing.

306-7.8.3.2 24-Inch (600 mm) or Smaller Inside Diameters. A mandrel shall be pulled through the pipe by hand to ensure the maximum allowable deflection has not been exceeded. Fittings shall be visually inspected to ensure the maximum allowable deflection has not been exceeded.

The mandrel shall be:

a) a rigid, nonadjustable, odd-numbered-leg (9 legs minimum) mandrel having an effective length not less than its nominal diameter,
b) fabricated from steel and be fitted with pulling rings at each end,
c) stamped or engraved on a segment other than the runner, with the pipe material specification, nominal size, and mandrel OD (e.g. PVC D3034-200 mm-187.10 mm; ABS Composite D2680-250 mm-243.43 mm; PVC D3034-8"-7.366"; ABS Composite D2680-10"-9.584"), and

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d) have a minimum diameter at any point along the full length conforming to Table 306-7.8.3.2.

TABLE 306-7.8.3.2

Pipe Material	Nominal Size		Minimum Mandrel Diameter[1]	
	Inches	mm	Inches	mm
PVC-ASTM D3034 (SDR 26)	6	150	5.331	135.4
	8	200	7.114	180.7
	10	250	8.875	225.4
	12	300	10.547	267.9
	15	375	13.032	331.0
PVC-ASTM D3034 (SDR 35)	6	150	5.455	138.6
	8	200	7.282	185.0
	10	250	9.085	230.8
	12	300	10.793	274.1
	15	375	13.342	338.9
PVC-ASTM F679 (T-1 Wall)	18	450	16.924	429.9
	21	525	19.952	506.8
	24	600	22.446	570.1
	27	675	25.297	642.5
	30	750	28.502	724.0
	33	825	32.399	822.9
	36	900	35.999	914.4
ABS or PVC Composite Pipe, ASTM D2680	6	150	5.578	141.7
	8	200	7.518	190.9
	10	250	9.458	240.2
	12	300	11.398	289.5
	15	375	14.308	363.4
FRPM, ASTM D3262, 46 psi (318 KPa)	8	200	7.363	187.0
	10	250	9.263	235.3
	12	300	11.163	283.5
	15	375	14.160	359.7
	18	450	17.040	432.8
	20	500	18.960	481.6
	21	525	19.920	506.0
	24	600	23.527	597.59
	27	675	25.661	651.8
	30	750	25.512	724.2
	36	900	34.571	878.1
	39	975	37.452	951.3
	42	1050	40.333	1024.4
	45	1125	43.214	1097.6
	48	1200	46.094	1170.8
	51	1275	48.975	1244.0
	54	1350	51.856	1317.1
	60	1500	57.618	1463.5
	66	1650	63.707	1618.1
	72	1800	69.498	1765.2
	78	1950	75.290	1912.4
	84	2100	81.081	2059.5
	90	2250	86.873	2206.6
	96	2400	93.139	2365.7
	102	2550	98.980	2514.1
	108	2700	104.86	2663.4
	114	2850	110.74	2812.8
	120	3000	116.62	2962.1
	132	3300	129.04	3277.5
	144	3600	140.86	3577.7

1. Metric mandrel diameters are direct conversions of mandrel diameters in U.S. Standard Measures. If the above types of pipe are available and specified by the appropriate ASTM in metric dimensions, as the primary measure, the Engineer will determine the appropriate mandrel diameter which conforms to this subsection.

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Prior to use, the mandrel shall be certified by the Engineer or by another entity approved by the Engineer. Use of an uncertified mandrel or a mandrel altered or modified after certification will invalidate the test.

If the mandrel fails to pass through the pipe, the pipe will be deemed to be over-deflected.

306-7.8.3.3 Inside Diameters Between 24 Inches (600 mm) and 36 Inches (900 mm). Deflections shall be determined by a method submitted to the Engineer in accordance with 3-8. Fittings shall be visually inspected to ensure the maximum allowable deflection has not been exceeded.

306-7.8.3.4 Inside Diameters Greater Than 36 Inches (900 mm). Deflections shall be determined by using a 1 inch (25 mm) diameter, nonadjustable metal bar; a minimum-radius rigid template; or by a method approved by the Engineer. Fittings shall be visually inspected to ensure the maximum allowable deflection has not been exceeded.

306-7.8.3.5 Laser Testing. The Contractor may substitute laser profile testing for mandrel testing.

306-7.8.3.6 Defective Work Remediation. Over-deflected pipe shall be uncovered and, if not damaged, reinstalled. Pipe subjected methods or process other than removal, which attempts, even successfully, to reduce or cure any over-deflection, shall be uncovered, removed from the Work site, and replaced with new pipe.

306-8 PREFABRICATED PRESSURE PIPE.

306-8.1 General. Prefabricated pressure pipe (pressure pipe) shall include pipe installations where:

a) the pipeline is designed to operate under continuous pressure, or
b) the pipeline is designed for bi-directional flow.

Installation of pipeline materials, fittings, valves and appurtenances shall conform to the pipe-specific Reference Specifications shown in Table 306-8.1 which shall be submitted to the Engineer in accordance with 3-8.4.

TABLE 306-8.1

Pressure Pipe Material	Material Specification	Installation Reference Specification[1]
Ductile Iron Pipe	209-1	AWWA C600 and 306-8.2
Steel Pipe	209-2	AWWA C604, and 306-8.3
Concrete Pressure Pipe	207-3	AWWA M9 Chapter 14 and 306-8.4
PVC Pressure Pipe	209-4	AWWA C605 and 306-8.5
High Density Polyethylene (HDPE) Pressure Pipe	209-5	AWWA M55 Chapter 8 and 306-8.5
Fiberglass Pressure Pipe	209-6	AWWA M45 Chapter 6 and 306-8.6
Valves and Appurtenances	212	Manufacturer's installation and warranty requirements

1. Where the manufacturer issues installation instructions, these shall be submitted to the Engineer in accordance with 2.5.3 along with the specifications referenced above. Any conflicts or discrepancies between the Reference Specifications shown above and the manufacturer's installation instructions shall be brought to the Engineer's attention in writing prior to the start of pipe installation. The Contractor shall allow 10 Working Days for resolution.

Pressure pipe shall be laid to the lines and grades shown on the Plans.

Joint restraints shall be constructed using welds, flanges, mechanical joints, or manufactured joint restraints as shown on the Plans or specified in the Special Provisions.

After the joints have been constructed, the pipe shall not be disturbed in any manner.

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The Engineer may require removal and relaying of any pipe which is not true in alignment or shows excessive settlement after laying.

At the close of work each Day, or whenever the Work ceases for any reason for more than 40 minutes, each exposed end of the pipe shall be securely closed unless otherwise approved by the Engineer.

306-8.2 Ductile Iron Pipe.

306-8.2.1 General. Ductile iron pipe shall be assembled in accordance with AWWA C600 and the applicable manufacturer's installation instructions.

306-8.2.2 Installation.

306-8.2.2.1 Push-On Joints. Push-on joints shall be assembled in accordance with AWWA C600 and the following:

a) On long radius curves, trenches shall be excavated wider than shown in Table 306-3.4 (B) to allow for straight-line assembly before deflection.

b) Cutting and machining shall conform to the manufacturer's installation and warranty requirements. Pipe shall not be cut with a cold chisel, standard iron pipe cutter, or any other method that may fracture the pipe or produce ragged, uneven edges.

c) Gasket recess and bell sockets of pipe or fittings and plain ends of mating pipe shall be cleaned. Joints shall be dirt-free.

d) Plain ends, sockets, and gasket shall be lubricated using soapy water or an approved pipe lubricant conforming to AWWA C600. Lubrication for spigot ends and instructions for lubricant use shall be supplied by the pipe manufacturer.

e) An elastomeric gasket ring shall be inserted into the gasket recess and be completely seated.

f) Spigot and bell ends shall slide together without displacement of elastomeric gasket.

g) The pipe shall be installed with the bell end facing in the direction of laying unless otherwise approved by the Engineer.

h) The spigot shall be inserted into the bell and forced slowly into position, using a large bar lever and wood block across the pipe end. For large pipe, a come-along (with padding that will not scratch the pipe) may be used.

i) After assembling the pipe in a straight line, horizontal or vertical deflections shall be made at the joints to conform with the alignment shown on Plans.

Push-on restrained joints shall incorporate flex-ring, split-ring or ring segments and shall be installed in accordance with the manufacturer's installation instructions for the joint design used.

Allowable push-on joint deflections shall not exceed the following:

TABLE 306-8.2.2.1

Pipe Nominal Diameter	Allowable Push-on-Joint Deflection	Allowable Restrained Joint Deflection
3-inch through 4-inch (75 to 100 mm)	4.0°	n/a
6-inch through 12-inch (150 to 300 mm)	4.0°	3.2°
14-inch (350 mm) and larger	2.4°	1.6°

1. The values shown in Table 306-8.2.2.1 are based on 80 percent of that recommended by AWWA M41 Table 11-4 and 11-5 in accordance with paragraph 4.3.4.4 of AWWA C600.

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306-8.2.2.2 Mechanical Joints. Mechanical joints shall be assembled in accordance with AWWA C600, and the following:

a) On long radius curves, trenches shall be excavated wider than shown in Table 306-3.4 (B) to allow for straight-line assembly before deflection.

b) Pipe cutting and machining shall conform to the manufacturer's installation and warranty requirements. Pipe shall not be cut with a cold chisel, standard iron pipe cutter, or any other method that may fracture the pipe or produce ragged, uneven edges.

c) Plain ends, sockets, and gaskets shall be lubricated using soapy water or an approved pipe lubricant as recommended in AWWA C600. Lubrication for spigot ends and instruction for lubricant use shall be supplied by pipe manufacturer.

d) An elastomeric gasket ring shall be inserted into the gasket recess and completely seated.

e) Spigot and bell ends shall slide together without displacement of the elastomeric gasket.

f) Joints shall be dirt free.

g) The pipe shall be installed with the bell end facing in the direction of laying unless otherwise approved by the Engineer.

h) The spigot end shall be inserted into the bell and forced slowly into position using a large bar lever and wood block across the pipe end. For large pipe, a come-along (with padding that will not scratch the pipe) may be used.

i) The gland shall be pushed toward the socket and centered around the pipe with the gland lip against the gasket.

j) Bolts shall then be inserted and nuts hand-tightened.

k) After assembling the pipe in a straight line, horizontal or vertical deflections shall be made at the joints to conform with the alignment shown on the Plans.

Allowable joint deflections for mechanical joints shall not exceed the following:

TABLE 306-8.2.2.2

Pipe Nominal Diameter	Allowable Mechanical Joint Deflection	Allowable Restrained Joint Deflection
3-inch through 4-inch (75 to 100 mm)	6.6°	n/a
6-inch (150 mm)	5.7°	3.2°
8-inch through 12-inch (200 to 300 mm)	4.3°	3.2°
14-inch through 16-inch (350 to 400 mm)	2.9°	1.6°
18-inch through 20-inch (450 to 500 mm)	2.4°	1.6°
24-inch (600 mm)	1.8°	1.6°
30-inch through 64-inch (750 to 1600 mm)	n/a	1.6°

1. The values shown in Table 306-8.2.2.2 are based on 80% of that recommended by AWWA M41 Table 11-4 and 11-5 in accordance with paragraph 4.3.4.4 of AWWA C600.

After the joints are deflected, bolts shall be tightened to within the normal range of bolt torque recommended by the manufacturer or AWWA M41 Table 11-3.

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306-8.2.2.3 Installation of Polyethylene (PE) Film Wrap on Iron Fittings. PE film wrap (film) shall be installed on ductile iron and cast iron fittings and pipe in accordance with AWWA C105 and the following:

a) Film shall be wrapped snugly around all exterior ferrous surfaces and 8 inches (200 mm) beyond bells, overlapping at least 2 inches (50 mm) at each seam.

b) Pipe shall be completely encased to prevent contact between the pipe and surrounding soil. Soil or bedding material shall be prevented from becoming trapped between the pipe and film.

c) Film shall not be installed on pipe sections or fittings to be installed through concrete slope anchors.

d) Film wrap shall be secured in place using 2-inch (50 mm)-wide plastic tape.

e) At least 3 circumferential turns of plastic tape shall seal the film wrap ends over the pipe and above valve bonnets.

f) Place circumferential wraps of tape at 3-foot (1 m) intervals along the pipe barrel to minimize the space between the film and the pipe.

g) Cuts, tears, punctures or damage to the film shall be repaired with adhesive tape or with a short length of polyethylene tube cut open, wrapped around the pipe, and secured in place.

In addition to wrapping ductile iron pipe with polyethylene, service lines of dissimilar metals and the attendant corporation stop shall be wrapped with polyethylene film or an approved dielectric tape for a minimum clear distance of 3 feet (1 m) from the main.

306-8.2.3 Acceptance. Ductile iron pipe shall successfully pass the following tests prior to completion of the Work:

TABLE 306-8.2.3

Item	Test For	Test Standard
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	209-1
Installed DIP	Alignment Deviation	As specified in the Special Provisions but not more than 1-foot (300 mm) horizontal, 0.25 foot (75 mm) vertical, or 0.1 foot (30 mm) vertical variation over 10 feet (3 m) of pipe having the same slope
	Hydrostatic Pressure Test	306-8.9.2.2
	Bacteriological Sampling and Testing	306-8.9.4.6
	11-Month Anniversary Warranty Inspection	306-8.9.6

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306-8.3 Steel Pipe.

306-8.3.1 General. Steel pipe shall be assembled in accordance with AWWA C604 and the applicable manufacturer's installation instructions.

306-8.3.2 Installation.

306-8.3.2.1 Welded Steel Pipe Joints. The Contractor shall submit welder qualification certificates for all personnel welding steel pressure pipe under the standard qualification procedure of the ASME Boiler and Pressure Vessel Code Section IX, "Welding Qualifications."

306-8.3.2.2 Welded Joints. Welded joints shall be constructed in accordance with AWWA C206, and the following:

a) Welders assigned to the Work shall be qualified under the AWS standard qualification procedure.

b) Joints to be welded shall be cleaned prior to placing pipe in the trench. Loose scale, heavy rust, paint, cement, and grease shall be removed. At least a 1/2 inch (12.5 mm) recess shall be provided between adjacent mortar-covered surfaces to place the weld.

c) After the pipe is in its final position, lap-welded slip joints or butt-welded joints shall be completed in accordance with the Plans.

d) During hand welding, metal shall be deposited in successive layers.

e) The minimum number of passes or beads in completed welds shall be as follows:

TABLE 306-8.3.2.2

Steel Cylinder Thickness	Fillet Weld Minimum Number of Passes
Smaller than 3/16 inch (5 mm)	1
3/16 inch through 1/4 inch (5 to 6 mm)	2
Greater than 1/4 inch (6 mm)	1 pass for each 1/8 inch (3 mm) of cylinder or fraction thereof.

f) After welding, surfaces of welds shall be cleaned, removing all dirt, scale, or welding flux.

g) For cement-mortar-lined and coated pipe, the interior surface of welded pipe shall be coated with cement mortar. Excess mortar shall be swabbed out.

h) For steel pipe with other lining systems, the interior surface shall be coated in accordance with the manufacturer's recommendations to obtain a lining of similar thickness and life to factory-applied lining.

306-8.3.2.3 Butt-Strap Closure Joints. Butt-strap closure joints shall be constructed in the trench after the pipe has been laid to the alignment and grade shown on Plans. Butt strap closure joints shall conform to the following:

a) Butt-strap closure joints shall be field-welded by full-circumferential fillet welds, or one edge may be shop welded and the other field welded. Welding shall conform to 306-8.3.2.2.

b) The joint exterior shall be coated with mortar to a minimum thickness of 1-1/2 inches (38 mm). Immediately prior to applying mortar to interior or exterior of joints, cement wash shall be applied to the metal to be coated.

c) The joint interior shall be filled with stiff cement mortar and finished smoothly with the inside of the pipe wall. Wire mesh, 2-inch (50 mm) x 4-inch (100 mm), No. 13 gauge (1.828 mm), clean, and free from rust, shall be applied to joint interiors so that the wires run circumferentially

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around the pipe on 2-inch (50 mm) spacing. Wires on 4-inch (100 mm) spacing shall be crimped in such manner to hold the mesh 3/8 inch (9.5 mm) from the metal joint surface. Mesh shall be lapped at least 8 inches (200 mm), and the wire held securely in position.

306-8.3.3 Acceptance. Steel pipe shall successfully pass the following tests prior to completion of the Work:

TABLE 306-8.3.3

Item	Test For	Test Standard
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	209-2
Installed Steel Pipe and Fittings	Alignment Deviation	As specified in the Special Provisions but not more than 1-foot (300 mm) horizontal, 0.25 foot (75 mm) vertical, or 0.1 foot (30 mm) vertical variation over 10 feet (3 m) of pipe having the same slope
	Hydrostatic Pressure Test	306-8.9.2
	Bacteriological Sampling and Testing	306-8.9.4.6
	Field Performance	Demonstrate compliance to Contract Documents and Manufacturer's printed literature
	11-Month Anniversary Warranty Inspection	306-8.9.6

306-8.4 Concrete Pressure Pipe.

306-8.4.1 General. Concrete pressure pipe shall be assembled in accordance with AWWA M9 Chapter 14 and the applicable manufacturer's installation instructions.

306-8.4.2 Installation. Push-on joints shall be assembled in accordance with AWWA M9 Chapter 14 and the following:

a) Pipe shall be supported free of bedding or foundation material during jointing.

b) Pipe shall not be driven to grade by striking with an excavator bucket or other equipment.

c) The bell and spigot shall be cleaned and free of dirt and mud. A thin layer of NSF60-compliant lubricant shall be applied to the bell face, the gasket recess of the spigot, and the gasket.

d) The elastomeric gasket stretch around the joint circumference shall be equalized by inserting a round rod under the gasket once it is placed in the spigot gasket recess and moving the rod around the full pipe circumference.

e) Upon completion, a steel feeler gauge 0.5 inch (12.5 mm) wide and 0.010 inch (250 µm) thick shall be inserted into the joint to determine by feel if the gasket is properly seated in the gasket recess. The full circumference of the gasket shall be checked.

f) A come-along, backhoe, or power winch shall be used to pull the pipe into the proper position by applying pressure to a wire-rope choker used to lay pipe. The pipe spigot shall be installed into the bell using a straight axial force to ensure proper gasket installation. The pipe shall not be tipped during insertion.

g) If interior protective coatings have not been pre-applied to the interior metal, exposed metal surfaces shall be cleaned and pipe joint interiors shall be coated with NSF 61-compliant Portland cement mortar consisting of no more than 3 parts sand to one part cement.

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h) The full circumference of exterior joint space shall be grouted with a band of grout consisting of no more than 3 parts sand to one part cement. The grout band shall be filled from one side only. Grout shall be routed or agitated to ensure no voids are present, then routed or agitated along both sides of the pipe alternately to settle the grout. The grout shall be allowed to stiffen for 15 minutes. More grout shall then be added to fill the joint completely. The top of the grout band shall be capped to protect the grout from backfill. The grout band shall not be removed from the joint.

i) The grout shall be allowed to fully harden before placing any bedding or backfill above the pipe bottom.

306-8.4.3 Acceptance. Concrete pressure pipe shall successfully pass the following tests prior to completion of the Work:

TABLE 306-8.4.3

Item	Test For	Test Standard Reference
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	209-3
Installed Concrete Pressure Pipe and Fittings	Alignment Deviation	As specified in the Special Provisions but not more than 1-foot (300 mm) horizontal, 0.25 foot (75 mm) vertical, or 0.1 foot (30 mm) vertical variation over 10 feet (3 m) of pipe having the same slope
	Hydrostatic Pressure Test	306-8.9.2
	Bacteriological Sampling and Testing	306-8.9.4.6
	11-Month Anniversary Warranty Inspection	306-8.9.6

306-8.5 PVC Pressure Pipe.

306-8.5.1 General. PVC pressure pipe shall be assembled in accordance with AWWA C605 and the applicable manufacturer's installation instructions.

306-8.5.2 Installation.

306-8.5.2.1 Push-on Joints. Push-on joints shall be assembled in accordance with AWWA C605 and the following:

a) Spigots and bells shall slide together without displacement of the elastomeric gasket. Joints shall be dirt-free. Pipe shall be installed with the bell facing in the direction of laying unless otherwise approved by the Engineer.

b) The full circumference of the spigot end, including beveled ends, shall be lubricated using an NSF 61-compliant lubricant supplied by the pipe manufacturer. If dirt or sand adhere to the lubricant, the spigot shall be cleaned and re-lubricated.

c) An elastomeric gasket ring shall be inserted and completely seated into the gasket recess. The lubrication for the spigot and instructions for lubricant use shall be supplied by the pipe manufacturer.

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d) The spigot shall be inserted into the bell and forced slowly into position using a large bar lever and wood block across the pipe end. For large pipe, a come-along (with padding that will not scratch the pipe) may be used.

e) If undue resistance to spigot insertion is encountered or a reference mark does not reach the flush position, the joint shall be disassembled and the position of the elastomeric gasket checked. If twisted or dislodged, the gasket, bell, and spigot shall be cleaned and re-assembled. If the gasket is not out of position, the distance between the reference mark and the spigot end shall be measured and checked against the correct values provided by the pipe manufacturer.

f) Allowable joint deflections shall not exceed the following:

TABLE 306-8.5.2.1

Pipe Nominal Diameter	Allowable Push-on-Joint Deflection	Allowable Joint Deflection with High Deflection Coupling	Allowable Bending for 20-Foot Length
4" (100 mm)	2.0°	4.0°	Longitudinal bending not permitted
6" (150 mm)	2.0°	4.0°	
8"-10" (200 mm-250 mm)	2.0°	4.0°	
12" (300 mm)	1.7°	4.0°	
14"-24" (350 mm-600 mm)	0.8°	4.0°	

1. The values shown in Table 306-8.5.2.1 are based on 80% of that recommended by AWWA M23 Table 13 or the coupling manufacturer. In no case shall deflection exceed 2 degrees in any direction without the use of high-deflection couplings.

306-8.5.3 Acceptance. PVC pressure pipe shall successfully pass the following tests prior to completion of the Work:

TABLE 306-8.5.3

Item	Test For	Test Standard
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	209-4
Installed PVC Pressure Pipe	Alignment Deviation	As specified in the Special Provisions but not more than 1 foot (300 mm) horizontal, 0.25 foot (75 mm) vertical, or 0.1 foot (30 mm) vertical variation over 10 feet (3 m) of pipe having the same slope
	Hydrostatic Pressure Test	306-8.9.2
	Bacteriological Sampling and Testing	306-8.9.4.6
	11-Month Anniversary Warranty Inspection	306-8.9.6

306-8.6 High-Density Polyethylene (HDPE) Pressure Pipe.

306-8.6.1 General. HDPE pressure pipe shall be assembled in accordance with AWWA M55 Chapter 8 and the applicable manufacturer's installation instructions.

306-8.6.2 Installation. Butt fusion joints shall be assembled in accordance with AWWA M55 and the following:

a) Pipe sections shall be joined above-ground and at the Work site into continuous water-tight leak-proof lengths. Pipe sections shall be joined in true alignment using equipment and methods which conform to the manufacturer's recommendations.

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b) Plain end pipes may be joined using either butt fusion or saddle fusion, and with either heat fusion or electrofusion.

c) Butt fusion shall conform to ASTM D2657, PPI TR33 and AWWA M55.

d) Electrofusion shall conform to ASTM F1290 and AWWA M55.

e) Saddle fusion shall conform to ASTM D2657, ASTM F905, PPI TR41 and AWWA M55.

f) Hot fusion joining of HDPE end sections, service, taps, and fittings may be performed in excavations.

g) Plain end pipes and fittings shall be joined by butt fusion conforming to ASTM D2657.

h) Branch connections to main shall be made with saddle fittings or tees. Main and saddle branch fittings shall be joined using saddle fusion procedures conforming to ASTM F905.

i) Fusions of unlike wall thicknesses are acceptable as long as the difference is limited to one SDR difference. Transitions between unlike wall thicknesses greater than one SDR shall be made with a transition nipple (a short length of heavier-wall pipe with one end machined to the lighter-wall) or by mechanical means.

j) Pressure shall not be removed until the joint has adequately cooled.

k) Rollback beads will result from the use of proper temperatures and pressures. External and internal beads from butt welding shall not be removed.

l) Joints shall be equal in tensile strength to that of the adjacent pipe.

m) HDPE pipe and fittings may be joined together or joined to other materials using electro-fusion, flanged connections, or mechanical couplings designed for joining HDPE pipe to mating material only when heat-fusion joining is not practical as determined by the Engineer. When joining pipe by any of the aforementioned methods, the installation instructions of the joining device manufacturer shall be followed.

n) Flange faces shall be centered and aligned to each other before assembling and tightening bolts. Flange bolts shall not be used to draw flanges into alignment. Bolt threads shall be lubricated and flat washers shall be installed under flange nuts. Bolts shall be tightened evenly according to the tightening pattern and torque step recommendations. At least 1 hour after the initial assembly, flange connections shall be retightened, following the manufacturer's tightening pattern and torque step recommendations. Final tightening torque shall be 100 foot-pounds (136 N-m) or as recommended by the manufacturer.

o) Mechanical joints using outside diameter compression mechanical couplings shall be installed with the stiffener in the bore of the HDPE pipe.

p) Plain ends of 16-inch (400 mm) iron pipe size (IPS) and larger fabricated fittings shall be butt-fused to the end of the pipe length. Flanged directional outlet connections to fittings shall be constructed in the trench. Flanged connections shall be assembled and tightened in accordance with the flange adapter manufacturer's instructions. No more than one pipe length shall be connected to a 16-inch (400 mm) IPS or larger directional fitting before placing the fitting in the trench.

q) Threaded or solvent-cement joints and connections will not be allowed.

r) Allowable pipe deflections shall not exceed the following:

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TABLE 306-8.6.2

Nominal Pipe OD	Minimum Cold-Bending Radius and Maximum Deflection per Foot (m) of Pipe Length				
	DR ≤ 9	9 < DR ≤ 13.5	13.5 < DR ≤ 21	DR > 21	Adjacent to Fitting or Flange
<3" (75 mm)	6.3' – 9.2°/LF (1.92 m – 30.2°)	7.8' – 7.3°/LF (2.38 m – 24.0°)	8.4' – 6.8°/LF (2.56 m – 22.3°)	9.4' – 6.1°/LF (2.87 m – 20.0°)	31.3' – 1.83°/LF (9.54 m – 6.00°)
3" (75 mm)	6.3' – 9.2°/ LF (1.92 m – 30.2°)	7.8' – 7.3°/LF (2.38 m – 24.0°)	8.4' – 6.8°/LF (2.56 m – 22.3°)	9.4' – 6.1°/LF (2.87 m – 20.0°)	31.3' – 1.83°/LF (9.54 m – 6.00°)
4" (100 mm)	8.3' – 6.9°/ LF (2.53 m – 22.6°)	10.4' – 5.5°/ LF (3.17 m – 18.0°)	11.3' – 5.1°/ LF (3.44 m – 16.7°)	12.5' – 4.6°/ LF (3.81 m – 15.1°)	41.7' – 1.38°/ LF (12.7 m – 4.53°)
6" (150 mm)	12.5' – 4.6°/ LF (3.81 m – 15.1°)	15.6' – 3.7°/ LF (4.75 m – 12.1°)	16.9' – 3.4°/ LF (5.15 m – 11.2°)	18.8' – 3.1°/ LF (5.73 m – 10.2°)	62.5' – 0.92°/ LF (19.0 m – 3.02°)
8" (200 mm)	16.7' – 3.4°/LF (5.09 m – 11.2°)	20.8' – 2.8°/LF (6.34 m – 9.19°)	22.5' – 2.6°/LF (6.86 m – 8.53°)	25.0' – 2.3°/LF (7.62 m – 7.55°)	83.3' – 0.70°/LF (25.4 m – 2.30°)
10" (250 mm)	20.8' – 2.8°/LF (6.34 m – 9.19°)	26.0' – 2.2°/LF (7.92 m – 7.22°)	28.1' – 2.04°/LF (8.56 m – 6.69°)	31.3' – 1.83°/LF (9.54 m – 6.00°)	104.2' – 0.60°/LF (31.76 m – 1.97°)
12" (300 mm)	25.0' – 2.3°/LF (7.62 m – 7.55°)	31.3' – 1.83°/LF (9.54 m – 6.00°)	33.8' – 1.70°/LF (10.3 m – 5.58°)	37.5' – 1.53°/LF (11.4 m – 5.02°)	125.0' – 0.46°/LF (38.1 m – 1.51°)
14" (350 mm)	29.2' – 1.96°/LF (8.90 m – 6.43°)	36.5' – 1.57°/LF (11.13 m – 5.15°)	39.4' – 1.46°/LF (12.01 m – 4.79°)	43.8' – 1.31°/LF (13.35 m – 4.30°)	145.8' – 0.39°/LF (44.44 m – 1.28°)
16" (400 mm)	33.3' – 1.72°/LF (10.15 m – 5.64°)	41.7' – 1.38°/LF (12.71 m – 4.53°)	45.0' – 1.27°/LF (13.72 m – 4.17°)	50.0' – 1.15°/LF (15.24 m – 3.77°)	166.7' – 0.34°/LF (50.81 m – 1.12°)
18" (450 mm)	37.5' – 1.53°/LF (11.43 m – 5.02°)	46.9' – 1.22°/LF (14.30 m – 4.00°)	50.6' – 1.13°/LF (14.42 m – 3.71°)	56.3' – 1.02°/LF (17.16 m – 3.35°)	187.5' – 0.31°/LF (57.15 m – 1.02°)
20" (500 mm)	41.7' – 1.38°/LF (12.71 m – 4.53°)	52.1' – 1.10°/LF (15.88 m – 3.61°)	56.3' – 1.02°/LF (17.16 m – 3.35°)	62.5' – 0.92°/LF (19.05 m – 3.02°)	208.3' – 0.28°/LF (63.49 m – 0.92°)
22" (550 mm)	45.8' – 1.25°/LF (13.96 m – 4.10°)	57.3' – 1.00°/LF (17.47 m – 3.28°)	61.9' – 0.93°/LF (18.87 m – 3.05°)	68.8' – 0.83°/LF (20.97 m – 2.72°)	229.2' – 0.25°/LF (69.86 m – 0.82°)
24" (600 mm)	50.0' – 1.15°/LF (15.24 m – 3.77°)	62.5' – 0.92°/LF (19.05 m – 3.02°)	67.5' – 0.85°/LF (20.57 m – 2.79°)	75.0' – 0.76°/LF (22.86 m – 2.49°)	250.0' – 0.23°/LF (76.20 m – 0.75°)
30" (750 mm)	62.5' – 0.92°/LF (19.05 m – 3.02°)	78.1' – 0.73°/LF (23.80 m – 2.40°)	84.4' – 0.68°/LF (25.73 m – 2.23°)	93.8' – 0.61°/LF (28.59 m – 2.00°)	312.5' – 0.18°/LF (95.25 m – 0.59°)
36" (900 mm)	75.0' – 0.76°/LF (22.86 m – 2.49°)	93.8' – 0.61°/LF (28.59 m – 2.00°)	101.3' – 0.57°/LF (30.88 m – 1.87°)	112.5' – 0.51°/LF (34.29 m – 1.67°)	375.0' – 0.15°/LF (114.3 mm – 0.49°)
42" (1050 mm)	87.5' – 0.65°/LF (26.67 m – 2.13°)	109.4' – 0.52°/LF (33.35 m – 1.71°)	118.1' – 0.49°/LF (36.00 m – 1.61°)	131.3' – 0.44°/LF (40.02 m – 1.44°)	437.5' – 0.13°/LF (113.4 m – 0.43°)
48" (1200 mm)	100.0' – 0.57°/LF (30.48 m – 1.87°)	125.0' – 0.46°/LF (38.10 m – 1.51°)	135.0' – 0.42°/LF (41.15 m – 1.38°)	150.0' – 0.38°/LF (45.72 m – 1.25°)	500.0' – 0.11°/LF (152.4 m – 0.36°)
54" (1350 mm)	112.5' – 0.51°/LF (34.29 m – 1.67°)	140.6' – 0.41°/LF (42.85 m – 1.35°)	151.9' – 0.38°/LF (46.30 m – 1.25°)	168.8' – 0.34°/LF (51.45 m – 1.12°)	562.5' – 0.10°/LF (171.5 m – 0.33°)
63" (1575 mm)	131.3' – 0.44°/LF (40.0 m – 0.44°)	164.1' – 0.35°/LF (50.0 m – 1.15°)	177.2' – 0.32°/LF (54.0 m – 1.05°)	196.9' – 0.29°/LF (60.0 m – 0.95°)	656.3' – 0.09°/LF (200.0 m – 0.30°)

1. The values shown in Table 306-8.6.2 are based on 125% of that recommended by AWWA M55 Table 8-2.

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306-8.6.3 Acceptance. HDPE pressure pipe shall successfully pass the following tests prior to completion of the Work:

TABLE 306-8.6.3

Item	Test For	Test Standard
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	209-5
Butt-Fusion or Saddle-Fusion Integrity	Bent-Strap Test	After fully cooling first trial fusion, cut fusion test straps at least 12" (300 mm) and at least 30 wall thicknesses long and at least 1" (25 mm) and at least 1.5 wall thicknesses wide. Fusion shall be in center of length. Bend test strap until ends of strap touch. If fusion fails at joint, a new trial fusion shall be made, cooled and tested. Do not begin butt fusion of pipe to be installed until trial fusion has passed bent strap test.
Installed HDPE Pressure Pipe	Alignment Deviation	As specified in the Special Provisions but not more than 1 foot (300 mm) horizontal, 0.25 foot (75 mm) vertical, or 0.1 foot (30 mm) vertical variation over 10 feet (3 m) of pipe having the same slope
	Mandrel Test	Pull mandrel through installed pipe to test for obstructions or pipe deformation beyond that specified below. Correct all obstructions in pipe at locations encountered by mandrel
	Hydrostatic Pressure Test	306-8.9.2
	Bacteriological Sampling and Testing	306-8.9.4.6
	11-Month Anniversary Warranty Inspection	306-8.9.6

306-8.7 Fiberglass Pressure Pipe.

306-8.7.1 General. Fiberglass pressure pipe shall be assembled in accordance with AWWA M45 Chapter 6 and the manufacturer's installation instructions.

306-8.7.2 Installation.

306-8.7.2.1 Push-On Joints. Push-on joints shall be assembled in accordance with AWWA C605 and the following:

a) Spigots and bells shall slide together without displacement of the elastomeric gasket. Joints shall be dirt-free. Pipe shall be installed with the bell facing in the direction of laying unless otherwise approved by the Engineer.

b) Joint lubricant shall be applied to the pipe ends and elastomeric seals of couplings. Only lubricants approved by the pipe manufacturer shall be used.

c) Pipes shall be pushed together using suitable hydraulic jacks. The maximum forces recommended by the pipe manufacturer shall not be exceeded.

d) Joints shall not be deflected during assembly. Pipes or fittings shall be joined in straight alignment then deflected to the required angle at deflection points.

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e) Allowable joint deflections for push-on joints shall not exceed the following:

TABLE 306-8.7.2.1

Pipe Nominal Diameter	Allowable Push-on-Joint Deflection Push on Joint Pressure Class 200 or Less	Allowable Push-on-Joint Deflection Push on Joint Pressure Class 250
3"-18" (75 mm-450 mm)	2.4°	2.0°
20"-30" (500 mm-760 mm)	1.6°	1.2°
36"-64" (900 mm-1600 mm)	0.8°	0.64°

1. The values shown above are based on 80% of that recommended by AWWA M45 or the manufacturer.

f) Connection of fiberglass pressure pipe to manways, fittings, and transitions to other pipe materials shall be water-tight.

306-8.7.3 Acceptance. Fiberglass pressure pipe shall successfully pass the following tests prior to completion of the Work:

TABLE 306-8.7.3

Item	Test For	Test Standard
Bedding and Backfill	Suitability for Use as Backfill	217
	Compaction	ASTM D1557
Pipe Material	Materials Inspection	209-6
Installed Fiberglass Pressure Pipe	Alignment Deviation	As specified in the Special Provisions but not more than 1 foot (300 mm) horizontal or 0.25 foot (75 mm) vertical
	Hydrostatic Pressure Test	306-8.9.2
	Bacteriological Sampling and Testing	306-8.9.4.6
	11-Month Warranty Inspection	306-8.9.6

306-8.8 Valves, Hydrants, and Appurtenances.

306-8.8.1 General. Valves, hydrants, and appurtenances shall be constructed in accordance with the Plans and submitted Reference Specifications.

306-8.8.2 Installation.

306-8.8.2.1 General. Valves, hydrants, and appurtenances shall be installed in accordance with the manufacturer's installation instructions. Conflicts between the Plans and submitted Reference Specifications and the manufacturer's installation instructions shall be submitted to the Engineer for resolution.

306-8.8.2.2 Flanged Joints. Flanged joints shall be assembled as follows:

a) Flange surfaces shall be cleaned to mate with the gasket. Loose dirt, scale and laitance shall be removed.

b) Pits, corrosion, dents or scratches which may interfere with proper sealing shall be repaired.

c) The gasket shall be inspected and verified to be of proper material and style, free of defects or damage.

d) Flange bolts and studs shall be inspected for proper material, size, threading, and length.

e) Bolt threads and nut contact surfaces shall be cleaned and lubricated using a lubricant chemically compatible with all of the materials it will be in contact with.

f) The gasket shall be centered on the flange.

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g) The mating flange bolt holes shall be aligned. Mating flange faces shall be flush against the gasket prior to bolt-up.

h) Bolts, nuts and washers shall be inserted and hand-tightened until snug.

i) Before tightening bolts beyond hand-tight, adjacent valves shall be operated through their full range of motion to ensure clear unobstructed operation of discs and other internal parts.

j) Bolts shall be tightened in 5-foot-pound (7 N-m) increments following a 180-degree opposing sequence. Tightening shall begin with the bolt nearest the "12-o'clock" position, then proceed to the opposing bolt nearest the "6-o'clock" position, then to the "3-o'clock" and "9-o'clock" positions, and continue in a similar alternating sequence until all bolts are tight.

k) Re-tighten bolts 24 hours after installation and pressure testing to compensate for any gasket relaxation.

l) Flange bolt torques shall be as recommended by the valve, appurtenance, or pipe manufacturer.

306-8.8.3 Thrust Blocks. Where pipe is not restrained, thrust blocks shall be constructed as follows:

a) Thrust blocks shall be constructed of concrete conforming to 201-1.

b) Concrete thrust blocks shall be constructed in accordance with 303 and as shown on the Plans.

c) Concrete blocks shall be constructed between undisturbed ground and fittings to be anchored.

d) The quantity of concrete and the bearing area of the pipe against undisturbed soil shall be as shown on the Plans or Standard Plans.

e) Unless otherwise shown, concrete shall be placed so pipe joints and fittings remain accessible to repairs.

306-8.8.4 Service Connections. Service connections shall be constructed as shown on the Plans. The minimum service connection size shall be 3/4 inch (19 mm). Where mains are laid in paved streets, service connections 2 inches (50 mm) and smaller shall be installed by boring unless otherwise approved by the Engineer.

Service laterals shall be placed under curbs and gutters by boring. The letter "W" shall be inscribed in the center of the curb face in line with each meter installation. The "W" shall be approximately 1-1/2 inches (38 mm) high and 1/16 inch (1.5 mm) deep. No kinks, flats, crushes or other reductions in the diameter of service laterals will be permitted.

306-8.8.5 Acceptance. Acceptance testing for valves and appurtenances shall conform to 306-8.9.3. Valves and appurtenances shall be pressure tested at the same time connecting pipelines are pressure tested. Valves, operators, or control and instrumentation elements whose pressure rating is less than the test pressure shall be protected or isolated during pressure testing.

306-8.9 Pipeline Pressure Testing, Disinfection, and Commissioning.

306-8.9.1 General. Pressure pipelines shall be pressure tested, disinfected, and commissioned in accordance with the requirements of this subsection.

306-8.9.2 Hydrostatic Pressure Test.

306-8.9.2.1 General. A minimum 4-hour hydrostatic pressure test shall be performed and successfully completed in accordance with AWWA C600 or C605 and the following.

306-8.9.2.2 Preparation. The Contractor shall apply test pressures at an approved outlet or fitting located within 5 feet (1.5 m) vertically of the lowest point of each pipe section to be tested. The Contractor shall

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provide and later securely plug such fittings. Where air valves or other suitable outlets are unavailable, the Contractor shall provide approved taps and fittings for air release, and securely plug these later.

The Contractor shall flush all mains and services with potable water (or water as otherwise approved by the Engineer and jurisdictional regulatory agencies) after the completion of construction. A sufficient number of suitable outlets at the end(s) of line(s) being flushed shall be provided in addition to those shown on the Plans to permit flushing of mains with water at a velocity of at least 2.5 feet per second (750 mm/s) over its entire length. Outlets provided shall meet the requirements for the fittings specified for the type of main constructed. Velocity through outlets and fittings shall not exceed 25 feet per second (750 m/s) during flushing. Drainage facilities shall be constructed as necessary to ensure water lines do not become contaminated during flushing.

The Contractor shall provide sufficient hoses, fittings and equipment to direct flushing water to an established point of discharge. The discharge point shall be an improved drainage structure capable of accepting the flow without damaging existing improvements or creating a public hazard. The Contractor shall also provide dechlorination of the flushing water chlorine residual as required to meet applicable NPDES permit requirements. Flushing in or adjacent to public streets shall be scheduled during periods of low traffic volume. Traffic control during flushing and discharge of flushing water onto traffic lanes shall be as specified in the Special Provisions.

Unless otherwise specified, the Contractor shall make the arrangements for, and provide the water for, flushing and its subsequent discharge.

306-8.9.2.3 Allowable Leakage. Allowable leakage shall be determined as follows:

No ductile iron or PVC pipe installation will be accepted if leakage exceeds that determined by the following formula (taken from AWWA C600 or AWWA C605):

$$L_{US} = SD(P)^{1/2}/148{,}000$$

in which L = allowable leakage, in gallons per hour

S = length of pipe tested, in feet

D = nominal diameter of pipe, in inches

P = average observed test pressure of the pipe being tested, as shown, in pounds per square inch gauge, based on the elevation of the lowest point in the line or section under test and corrected to the elevation of the test gauge.

$$(L_{SI} = SD(P)^{1/2}/794{,}800)$$

(L_{SI} in liters per hour, S in meters, D in millimeters, P in kilopascals)

No gasketed steel pipe installation will be accepted if leakage exceeds that determined by the following formula (taken from AWWA C604):

L_{US} = 10 gallons per inch-diameter per mile of pipe per 24 hours

L_{SI} = 0.93 liters per millimeter-diameter per kilometer of pipe per 24 hours

When testing against closed valves, an allowance of 0.0078 gallons per hour per inch of nominal valve size may be added to that computed using formulas above to account for leakage around seals.

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For PVC, ductile iron, or gasketed steel pipe, allowable leakage shall be as shown in Table 306-8.9.2.3.

TABLE 306-8.9.2.3

Allowable Leakage in PVC OR Ductile Iron Pipe, Gallons per Hour per 1000' (Liters per Hour per 1,000 m) of Pipe					Allowable Leakage in Gasketed Steel Pipe, Gallons per Hour per 1000' (Liters per Hour per 1,000 m) of Pipe	Additional Allowable Leakage through Seals of Closed Valves, Gallons (Liters) per Valve
Pipe Diameter	Test Pressure					
	150 psi (1.0 MPa)	200 psi (1.4 MPa)	250 psi (1.7 MPa)	300 psi (2.1 MPa)	All Pressures	All Pressures
3" (75 mm)	0.25 (3.10)	0.29 (3.60)	0.32 (3.97)	0.35 (4.35)	0.24 (2.98)	0.02 (0.08)
4" (100 mm)	0.33 (4.10)	0.38 (4.72)	0.43 (5.34)	0.47 (5.84)	0.32 (3.97)	0.03 (0.11)
6" (150 mm)	0.50 (6.21)	0.57 (7.08)	0.64 (7.95)	0.70 (8.69)	0.47 (5.84)	0.05 (0.19)
8" (200 mm)	0.66 (8.20)	0.76 (9.44)	0.85 (10.6)	0.94 (11.7)	0.63 (7.82)	0.06 (0.23)
10" (250 mm)	0.83 (10.3)	0.96 (11.92)	1.07 (13.29)	1.17 (14.53)	0.79 (9.81)	0.08 (0.30)
12" (300 mm)	0.99 (12.30)	1.15 (14.28)	1.28 (15.90)	1.40 (17.39)	0.95 (11.80)	0.09 (0.34)
14" (350 mm)	1.16 (14.41)	1.34 (16.64)	1.50 (18.63)	1.64 (20.37)	1.10 (13.66)	0.11 (0.42)
16" (400 mm)	1.32 (16.39)	1.53 (19.00)	1.71 (21.24)	1.87 (23.22)	1.26 (15.65)	0.12 (0.45)
18" (450 mm)	1.49 (18.50)	1.72 (21.36)	1.92 (23.85)	2.11 (26.20)	1.42 (17.64)	0.14 (0.53)
20" (500 mm)	1.66 (20.62)	1.91 (23.72)	2.14 (26.58)	2.34 (29.06)	1.58 (19.62)	0.16 (0.61)
24" (600 mm)	1.99 (24.71)	2.29 (28.44)	2.56 (31.79)	2.81 (34.90)	1.89 (23.47)	0.19 (0.72)
30" (750 mm)	2.48 (30.80)	2.87 (35.64)	3.21 (39.87)	3.51 (43.59)	2.37 (29.43)	0.23 (0.87)
36" (900 mm)	2.98 (37.01)	3.44 (42.72)	3.85 (47.81)	4.21 (52.59)	2.84 (35.27)	0.28 (1.06)
42" (1050 mm)	3.48 (43.22)	4.01 (49.80)	4.49 (55.76)	4.92 (61.10)	3.31 (41.11)	0.33 (1.25)
48" (1200 mm)	3.97 (49.30)	4.59 (57.00)	5.13 (63.71)	5.62 (69.80)	3.79 (47.07)	0.37 (1.40)
54" (1350 mm)	4.47 (55.51)	5.16 (64.08)	5.77 (71.66)	6.32 (78.49)	4.26 (52.91)	0.42 (1.59)
60" (1500 mm)	4.97 (61.72)	5.73 (71.16)	6.41 (79.61)	7.02 (87.18)	4.73 (58.74)	0.47 (1.78)
64" (1600 mm)	5.30 (65.82)	6.12 (76.01)	6.84 (84.95)	7.49 (93.02)	5.05 (62.72)	0.50 (1.89)

For welded steel pipe, no leakage will be permitted.

For HDPE pipe, no leakage will be permitted.

306-8.9.2.4 Test Procedure. A 4-hour hydrostatic pressure test shall be performed in accordance with the following:

Pipe, appurtenances, and permanent thrust blocks shall be submitted to a hydrostatic pressure test after they have been installed and backfilled sufficiently, and after temporary plugs, caps, thrust blocks and shoring have been installed to provide the required restraint.

The test pressure shall be 50 pounds per square inch (350 kPa) in excess of the working pressure shown on the Plans for the class of pipe constructed unless the test pressure is specified elsewhere in the Contract Documents.

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The Contractor shall conduct pressure tests or retests subsequent to any trench backfill compactive effort that is performed using compacting equipment having an overall weight in excess of 100 pounds (45 kg).

If butterfly valves or other pipeline appurtenances may have a maximum working water pressure less than test pressure, the Contractor shall apply a minimum back pressure on these closed devices equal to the difference between the test pressure and the rated pressure of the device.

The Contractor shall complete and pass the pressure test and disinfection tests specified in 306-8.9.4 prior to connecting any new line to the existing pipe and mains. Test of new mains shall be conducted with the new valves open, and the open ends of pipes, valves, and fittings suitably closed or blind-flanged. Valves shall be operated and checked prior to the test period.

The maximum length of pipe to be included in any one test shall not exceed 2,500 feet (760 m) or the distance between the valves, whichever is greater. Suitable test bulkheads, blocking, and fittings shall be installed as necessary to permit such sectionalizing.

The Contractor shall fill the pipeline slowly and maintain at operating pressure for at least 24 hours prior to testing to satisfy any system water absorption. While filling and immediately prior to testing, all air shall be expelled from the pipeline.

The Contractor shall then pressurize the pipeline to the specified test pressure following a 48-hour soak period. When the test pressure has been reached, pumping shall be discontinued until the line pressure has dropped 10 pounds per square inch (70 kPa), at which time the line pressure shall again be pumped up to the test pressure. This procedure shall be repeated until 4 hours have elapsed from the time the test pressure was first applied. At the end of this period, the pressure shall be pumped up to the test pressure one last time.

Leakage shall be computed as the total quantity of water pumped into the pipeline during the test period, including water added to reach the specified test pressure for the final time. Leakage shall not exceed the rate specified for the type of pipe tested.

The Contractor shall repeat the testing until the leakage does not exceed the specified leakage rate. The Contractor shall repair all visible leaks regardless of the amount of leakage.

All tests shall be completed in the presence of the Engineer who will record the results.

306-8.9.3 Testing of Valves and Appurtenances. Field testing of valves and appurtenances shall conform to the following:

TABLE 306-8.9.3

Item	Test for	Test Standard
Valves and Appurtenances	Installation and Leakage	Visual Inspection for drip-tight service under pressure for all joints and for all valves in closed position.
	Anchorage and Support of Exposed Pipe	Visual inspection of finished installation. support in accordance with California Plumbing Code Table 3-1 and 3-2
	Pressure Test	See 306-8.9.2.2
	Bacteriological Test	See 306-8.9.4.6
	Valve Actuators	Operate valve through 10 full cycles of opening and closing. Valve shall operate from full open to full close without sticking, or binding and without required operating torque exceeding 150 ft-lbs at any point
	Field Performance	Demonstrate compliance to Contract Documents, AWWA standards and manufacturer's printed literature
	11-Month Anniversary Warranty Inspection	306-8.9.6

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306-8.9.4 Disinfection

306-8.9.4.1 General. Potable water facilities shall be disinfected in accordance with AWWA C651 and the following.

306-8.9.4.2 Submittals. The following submittals are required:

TABLE 306-8.9.4.2

Submittal	Description
Testing, Disinfection, Flushing and Dechlorinating Plan	If requested by the Engineer, submit a detailed plan showing how the pipeline will be tested, disinfected, and flushed, and how the discharge from the flushing operation will be dechlorinated.
Written Permission to Discharge into Sewer or Storm Drain	Required from the owner of any sanitary sewer or storm drain prior to the discharge of flushing water into sewer or storm drain. The submittal shall include any special requirements for treatment of flushing water prior to discharge, an estimate of the expected maximum discharge rate of the flushing flow, and an analysis of the sewer or storm drain capacity.
Laboratory Report for Disinfection Testing	Submit a report from the Engineer-accepted testing laboratory

306-8.9.4.3 Potable Water System Disinfection Procedures. Following flushing and pressure testing, disinfection shall proceed as follows:

Pipelines, valves, hydrants, service laterals, fittings, tanks and other surfaces exposed to water shall be disinfected in accordance with AWWA C651 except as otherwise specified herein.

The Contractor shall provide sampling locations in accordance with AWWA C651 and the California Division of Drinking Water Programs regulations.

After flushing, piping for potable water service shall be disinfected with a chlorine compound solution made with liquid chlorine, calcium hypochlorite in solution, or a sodium hypochlorite solution, which shall be water mixed and introduced into the mains to produce a dosage of not less than 50 mg/l nor more than 100 mg/L in all sections of the pipeline and appurtenances.

Treated water shall be retained within the system for at least 24 hours and shall, at the end of the retention period, produce a chlorine residual of not less than 25 mg/L in all sections of the pipeline being disinfected.

If the tests are not satisfactory, the Contractor shall provide additional disinfection as required until all tests are passed.

During the disinfection process, valves, hydrants, and other accessories shall be operated.

The Contractor shall not allow chlorinated water to remain in contact with internal waterway ports of pumps, valves, and sensor line assemblies for longer than necessary.

After chlorination, the Contractor shall flush water from the pipeline at its extremities until replacement water tests are equal chemically and bacteriologically to those of the permanent source of supply. Flush water shall be dechlorinated in accordance with applicable NPDES permit requirements.

Placing of HTH capsules or powder in pipe sections during the laying process will not be considered adequate disinfection.

The Contractor shall keep adequate chlorine residual testing and indicating apparatus available on site during the entire disinfection period. After final flushing, the Contractor shall plug flushing fittings with devices intended for this purpose at the pressure class of the pipe.

Where the water main is coated for disinfection, plugs and outlets shall be similarly coated.

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The Contractor shall keep and provide to the Engineer accurate documentation of the dosing rate (ppm), time of dosing and duration. The dosing agent's name, contact information and signature shall be provided.

306-8.9.4.4 Recycled Water System Disinfection Procedures. Disinfection of recycled water system components shall conform to 306-8.9.4.3, except calcium hypochlorite tablets or granules may be used to disinfect recycled water mains and services.

306-8.9.4.5 Dechlorination and Flushing. The Contractor shall dechlorinate and remove pollutants from water flushed from water mains in accordance with AWWA C655 and the discharge requirements and locations specified in the Special Provisions.

306-8.9.4.6 Bacteriological Sampling and Testing. On 2 consecutive days, the Contractor shall take bacteriological samples and submit them to a laboratory approved by the Engineer. Passing bacteriological tests on 2 consecutive days shall be achieved prior to connecting the pipeline to the existing water system or placing the pipeline into service. If the initial chlorination fails to produce 2 consecutive days of passing bacteriological tests, chlorination shall be repeated until 2 consecutive days of passing bacteriological tests are achieved. Samples of water for the specified bacteriologic test shall be taken from each end of the disinfected main (located downstream of the point of introduction of the chlorine disinfectant). For mains over 2,400 feet (730 m) in length, additional samples shall be taken at intermediate points in such a manner that at least one sample is taken for every 1,200 feet (365 m) of main.

If trench water has entered the new main during construction, or if, in the Engineer's opinion, excessive dirt or debris have entered the new main, bacteriological samples shall be taken at intervals of approximately 200 feet (60 m) to the extent such sampling is possible.

Satisfactory bacteriological results shall conform to all of the following:

a) No total or fecal coliform.
b) A heterotrophic plate count less than 500 colony forming units (CFU) per mL
c) Presence of chlorine residual.

306-8.9.4.7 Laboratory Report. The laboratory report shall be on a chain of custody, lab work sheet, or summary letter imprinted with the laboratory's name, address, and phone number. The report shall specify the field tests, laboratory analysis and results, and shall be signed by the laboratory director.

The laboratory report shall be submitted to the Engineer for approval.

The Engineer may reject the report if any data is missing or suspect due to conflicting indications.

306-8.9.5 Pipeline Commissioning. Pipelines passing disinfection bacteriological testing shall be placed into service within 4 weeks from the date of sampling, or shall be resampled and tested prior to being placed into service.

306-8.9.6 Eleven-Month Anniversary Warranty Inspection. A warranty inspection shall be conducted during the 11th month following completion of the Work.

The Engineer will establish the date for the warranty inspection and will notify the Contractor at least 30 Days in advance. If notification of the inspection date does not occur within 12 months after completion of the Work, the first anniversary inspection shall be considered to be waived.

The following occurrences will be considered to be system failures:

a) Locations found where trench resurfacing has settled below matching grade.

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b) Locations found where coatings or paint have peeled, bubbled or cracked, or locations where rust is evident.

c) Locations found where furnished manufactured products show visible leakage.

d) Locations found where piping, valves, appurtenances, or other pipeline equipment fail to perform as specified in applicable AWWA standards and to the level of performance described in the Contract Documents and applicable submittals.

The Contractor shall remove failed trench resurfacing, coating, or painting work identified during the warranty inspection and replace or reconstruct in conformance with the original requirements of the Contract Documents unless otherwise directed by the Engineer. Repaired painted areas shall be re-tested using spark testing or other methods specified in the Special Provisions. If the area of failure exceeds 25 percent of the total trench resurfacing area or 25 percent of the coated or painted surface area on any structure or surface, the Contractor shall remove and replace the entire trench resurfacing, coating or paint system in conformance with the original requirements of the Contract Documents.

The Contractor shall repair or replace piping and appurtenances showing visible leakage or failing to perform as specified in applicable AWWA standards and to the level of performance described in the Contract Documents and applicable submittals.

If repairs are required under the 11-month anniversary warranty inspection, the warranty period shall be extended to the date repairs are complete as determined by the Engineer.

306-9 CAST-IN-PLACE NON-REINFORCED CONCRETE PIPE (CIPCP).

306-9.1 General. These specifications are for cast-in-place non-reinforced concrete pipe intended to be used for gravity and low head drains and irrigation systems.

306-9.2 Materials. Concrete, unless otherwise specified in the Special Provisions, shall be Class 560-C-3250 (Class 330-C-23) conforming to 201-1 except that:

a) The slump shall be 1 inch (25 mm) minimum and 3 inches (75 mm) maximum. No water shall be added after the slump test material has been sampled,

b) Batch proportions shall be designed by the Contractor and submitted to the Engineer in accordance with 3-8.

306-9.3 Trench Excavation.

306-9.3.1 General. Trenches shall conform to the alignment and grades shown on the Plans. The subgrade shall be fine graded to the tolerances specified in 306-9.5.2.5.

The bottom of the trench shall be shaped to serve as the outside form of the pipe. The "trench form" shall be defined as the portion of the trench over the bottom 210 degrees of the pipe. The trench form shall provide full, firm, and uniform support for the pipe.

306-9.3.2 Trench Width. Except for curves and structures, the trench width shall not exceed the outside diameter of the pipe plus 2 inches (50 mm) for a height of 1 foot (0.3 m) above the top of the pipe.

306-9.3.3 Isolated Rock. Where isolated rock is encountered within the trench form, it shall be removed. If the rock is too large to be removed by hand, the portion of the rock within 6 inches (150 mm) of the lower 90 degrees of the trench form shall be removed. The void shall be filled with monolithically placed concrete prior to construction of the pipe or backfilled with soil compacted to a minimum relative compaction of 90 percent. The method shall be approved by the Engineer.

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306-9.3.4 Extensive Rock. Where extensive rock is encountered, the bottom 90 degrees of soil and rock shall be overexcavated to a depth of 6 inches (150 mm) below the trench form and 12 inches (300 mm) along the remaining portions. The void shall be filled with monolithically placed concrete prior to construction of the pipe or backfilled with soil compacted to a minimum relative compaction of 90 percent. The method shall be approved by the Engineer.

306-9.4 Placement.

306-9.4.1 General. Concrete placement shall conform to 303-1.8 unless otherwise specified in the Special Provisions. Concrete shall not be placed when the temperature of the concrete exceeds 90°F (32°C) or is less than 50°F (10°C). The temperature of the soil adjacent to the trench shall be above 32°F (0°C).

306-9.4.2 Soil Moisture. At the time of concrete placement, soil which will be in contact with CIPCP shall be moistened, but shall not contain standing, seeping, or flowing water. The Contractor may place a layer of 1 inch (25 mm) maximum size rock 6 inches (150 mm) thick below the trench invert to assist in water control.

306-9.4.3 Concrete Forms. Concrete shall be placed around the full circumference of the pipe in one operation by means of fixed forms and traveling forms. The internal fixed forms shall be of sufficient strength to withstand the vibrating or tamping of the concrete, and prevent deformation during placement. Inflatable internal forms shall not be used. The concrete shall be vibrated, tamped, or worked with suitable devices until consolidated and the forms are completely filled.

306-9.4.4 Junction Structures. Where junction structures are to be constructed, CIPCP shall be constructed continuous through the structure locations. The pipe shall be cut away to the specified opening prior to the concrete setting. Alternate methods may be used as approved in writing by the Engineer.

306-9.4.5 Construction Joints. When placement is stopped for a period of time long enough that initial set may occur or for 20 minutes, whichever is less, a construction stoppage joint shall be constructed by sloping the end of the pipe at approximately 45 degrees and inserting 24-inch (600 mm) long No. 3 (No. 10M) dowels 12 inches (300 mm) into the center of the pipe wall at intervals of approximately 18 inches (450 mm) around the pipe circumference. The total exposed face shall be left in a roughened condition.

Before placement operations may resume, the concrete placed at the construction stoppage joint shall have attained sufficient strength to permit an excavation to be made on each side of the joint to form a concrete collar. This collar shall be centered on the joint and have a minimum thickness of 1-1/2 times the pipe wall thickness and a minimum length of 24 inches (600 mm). The joint shall be cleaned of laitance, foreign, and loose materials before resuming concrete placement.

306-9.4.6 Form Removal. Internal fixed forms shall remain in place until the concrete is self-supporting, after which they may be loosened but shall not be removed for at least 6 hours after placement. As soon as practical thereafter, the forms shall be removed to facilitate inspection and prompt repair. During times of low temperatures or other adverse conditions the forms may be kept in place for longer periods of time.

306-9.4.7 Finishing. The interior shall be at least as smooth as a steel trowel finish except for the form lap ridges permitted in 306-9.8.2.4.

306-9.5 Curing. Immediately after placement, the exposed top portion of the pipe shall be cured by placing a polyethylene film at least 1.5 mils (38 μm) thick so as to completely cover the top surface. Each opening in the pipe shall be covered with polyethylene and loosely secured to prevent drafts for at

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least 7 Days immediately after placement. At locations where work on the pipe is required, and only during the period that such work is actually in progress, shall necessary openings be uncovered.

306-9.6 Repairing. After the internal fixed forms have been removed, the inside of the pipe will be inspected by the Engineer. Rock pockets, blisters, voids, or similar defects not extending through the wall and less than 2 square feet (0.18 m^2) in area, shall be repaired immediately by removing the defective concrete and replacing it with bonded and cured mortar or other patching material approved by the Engineer.

Rock pockets, blisters, voids, or other defects greater than 2 square feet (0.18 m^2) or which extend through the pipe wall shall be repaired by removing the entire pipe for 1 foot (300 mm) on each side beyond the limits of the defect.

Cracks shall not be repaired until the backfill has been placed. However, the Contractor may remove and replace cracked pipe prior to placement of the backfill.

Subsequent to placement of the backfill, the Contractor shall notify the Engineer when the pipe is ready for reinspection. Cracks less than 10 mils (250 µm) in width or cracks greater than 10 mils (250 µm) in width but less than 12 inches (300 mm) long shall be painted with a cement paste. Longitudinal cracks exceeding 10 mils (250 µm) in width and 12 inches (300 mm) in length shall be repaired by epoxy pressure grouting provided the total length of cracks for any reach is less than 25 percent. If the total length of cracks exceeds 25 percent, the entire reach shall be removed and replaced. A reach shall be defined as any length between 2 structures.

Circumferential cracks exceeding 10 mils (250 µm) in width and 12 inches (300 mm) in length shall be repaired by removing at least 1 inch (25 mm) of concrete in width for a depth of at least 1/2 the wall thickness. After cleaning this area, it shall be filled with bonded mortar and cured.

Alternate repair methods shall be submitted in writing not less than 7 Days prior to use for approval by the Engineer. Any repairs performed shall ensure the specified structural strength is not compromised and by techniques which have been approved by the Engineer.

306-9.7 Sampling and Testing.

306-9.7.1 General. Sampling and testing shall be performed in the sequence described herein. Concrete will be tested during placement operations in accordance with 201-1.1.4. If the concrete cylinders do not meet the required 28-Day strength, cores shall be obtained from the completed pipe. Cores shall be used to determine the wall thickness and compressive strength. Strength test results shall be verified by a laboratory approved by the Engineer.

The Engineer will determine the number and location of the samples to be taken and tests to be performed by the Contractor. The location shall be identified by station, and where applicable, the angle from vertical measured clockwise facing up-station.

306-9.7.2 Wall Thickness. The Engineer will determine the wall thickness in accordance with the following:

a) The thickness at the invert and crown of the pipe will be measured by probing at approximately 25 foot (7.5 m) intervals during placement of the concrete. The probe will be forced through the concrete to make firm contact with the form at the crown and will be held in a position normal to the surface when the measurement is taken. The invert shall be inspected by removing a small portion and measuring the thickness. The probe shall be a 3/8 inch (9.5 mm) round bar, at least 2 inches (50 mm) longer than the wall thickness to be measured, rounded on one end with a tee handle on the other.

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b) The thickness at the invert and springline will be measured through holes drilled by the Contractor. The holes shall be at least 3/4 inch (19 mm) in diameter and shall be drilled after the removal of the forms and within 72 hours of concrete placement.

Three holes shall be drilled every 50 feet (15 m) at the invert and both springlines and shall be located as determined by the Engineer. The Engineer may require additional holes on curves.

After measurement, the Contractor shall fill all holes with Class "C" mortar conforming to 201-5.

306-9.7.3 Concrete Cores. Cores, when required by the Engineer, shall be obtained from CIPCP and tested in accordance ASTM C42. The Contractor shall obtain the cores. Testing shall be arranged by the Contractor and performed at a laboratory approved by the Engineer. The cores shall have a length-to-diameter ratio of not less than one. The diameter of cores shall be at least 3 times the maximum size of the aggregate used in the concrete, except where the wall thickness if such that the length-to-diameter will be less than one, in which case the core diameter may be reduced to 2-1/2 times the maximum aggregate size used.

At least 4 cores shall be taken for each 200 feet (60 m), or fraction thereof, of pipe. Cores shall be taken at the following points at stations selected by the Engineer: one through the crown, one through the invert, and 2 in the lower half of the pipe 45 degrees from the vertical. The Engineer may require additional cores at any location. The Contractor shall patch each core hole in such a manner that the patch will be permanent, not leak, and have a smooth finish flush with the interior surface.

306-9.7.4 Load Bearing Tests. Load bearing tests shall be performed by the Contractor every 1,000 feet (300 m) of pipe having the same size and wall thickness, with a minimum of 1 per size and 2 for the Work. The test locations will be determined by the Engineer. The tests shall be performed in the presence of the Engineer.

The method and apparatus requirements shall be as follows:

a) The test shall be performed with only the trench form providing bottom support. If the pipe has been constructed so that more than 210 degrees is in contact with the natural soil, the trench wall shall be re-excavated to provide 210 degrees of trench form without altering the existing bedded condition of the trench form.

b) The test length shall be at least 4 feet (1.2 m) and not more than 5 feet (1.5 m). At the option of the Contractor, the test section may be isolated from the completed pipe.

c) The test load shall be applied by use of a "sand box," consisting of a frame and bearing plate, in such a manner that sand carefully placed in the sand box forms a bearing symmetrically about the centerline and over the entire length of the test section. The width of the bedding shall be 0.7 times the specified internal diameter of the pipe. The minimum thickness of the sand shall be 0.25 times the specified internal diameter.

d) The frame and bearing plate shall be sufficiently rigid such that the load is distributed uniformly and the frame and plate will not deform under the loaded condition. The interior surfaces of the frame shall be smooth. The lower surface of the bearing plate shall be a true plane. Cloth or plastic film shall be attached to the inside of the frame along the lower edges to prevent the loss of sand through the gap between the pipe and the frame. This type of apparatus is described in ACI 346.

e) The frame shall be properly located on the pipe test section and filled with sand. The sand shall be clean and graded to pass a No. 4 (4.75 mm) sieve. The sand shall be struck off level and covered with the bearing plate. During the test, the bearing plate shall not contact the frame.

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f) The load shall be applied symmetrically on the bearing plate until the total required has been attained. The pipe shall remain loaded until the interior of the pipe has been inspected by the Engineer and results have been observed and recorded.

g) The applied load, in pounds (N), shall equal the test load multiplied by the length of the test section, in feet (meters).

The test load shall be calculated as follows:

U.S. Standard Measures:

Test Load = $(127.5H + 1.5LL + 5.56T)\ OD + 34.0(ID)^2$

SI Units:

Test Load = $(20030H + 1.5LL + 10.48T)\ OD + 5340\ (ID)^2$

Where:

ID = Specified inside diameter of the pipe in feet (meters).

T = Specified wall thickness of the pipe in inches (mm).

OD = ID + 2T/12 = Outside diameter of pipe in feet.

(SI Units: OD = ID + 2T/1000 = Outside diameter of pipe in meters.)

H = Depth of cover on pipe in feet (meters).

LL = Live load on pipe in pounds per square foot (kPa).

TABLE 306-9.7.4

Depth of Cover ft (m)	Live Load (LL) lbs/ft^2 (kPa)
3 (0.9)	489 (23.4)
4 (1.2)	314 (15.0)
5 (1.5)	234 (11.2)
6 (1.8)	182 (8.71)
7 (2.0)	145 (6.94)
8 (2.4)	119 (5.70)
9 (2.7)	120 (5.75)
10 (3.0)	90 (4.31)
Over 10 (3.0)	N/A

h) The total test load shall be supported by the test section without the development of any additional cracking.

i) After the satisfactory completion of the test, the Contractor shall repair the pipe, resulting from isolating the test section, in a manner satisfactory to the Engineer.

In lieu of using a "sand box" as described above, the Contractor may conduct a wheel load test on a 4 foot (1.2 m) section of pipe when approved in writing by the Engineer. The load applied shall be determined by the equation above applied to a section of pipe. The total test load shall be supported by the test section without the development of any additional cracking.

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306-9.8 Dimensions and Tolerances.

306-9.8.1 General. The minimum nominal size of CIPCP shall be 24-inch (600 mm) inside diameter.

306-9.8.2 Diameter. The inside diameter of the pipe at any point shall not be less than 99 percent nor more than 105 percent of the nominal diameter, and the average of any 4 measurements of the inside diameter made at 45-degree intervals shall not be less than the nominal diameter.

306-9.8.3 Wall Thickness. Unless otherwise shown on the Plans, the minimum wall thickness shall not be less than that shown in Table 306-9.8.3. The wall thickness shall be uniform around the circumference of the pipe.

TABLE 306-9.8.3

Inside Diameter inches (mm)	Minimum Wall Thickness inches (mm)
24 and 30 (600 and 750)	3 (76)
36 (900)	3-1/2 (89)
42 (1050)	4 (102)
48 (1200)	5 (127)
54 (1350)	5-1/2 (140)
60 (1500)	6 (153)
66 (1650)	6-1/2 (165)
72 (1800)	7 (178)
78 (1950)	7-1/2 (191)
84 (2100)	8 (203)
90 (2250)	8-1/2 (216)
96 (2400)	9 (229)
108 (2700)	10 (254)
120 (3000)	12 (305)
132 (3300)	14 (356)
144 (3600)	15 (381)

For an inside diameter not shown above or on the Plans, the minimum wall thickness shall be equal to the next size larger pipe.

306-9.8.4 Offsets and Indentations. Offsets and indentations, including transverse and longitudinal form offsets and construction stoppage joints, shall not exceed 1/4 inch (6 mm) in width for pipe with a specified inside diameter of 42 inches (1050 mm) or less, 3/8 inch (9.5 mm) for pipe with a specified inside diameter over 42 inches (1050 mm) and less than 72 inches (1800 mm), and 1/2 inch (12.5 mm) for pipe diameters equal to or greater than 72 inches (1800 mm).

Reaches having offsets or indentations in excess of these limits shall be repaired as approved by the Engineer.

306-9.8.5 Grade and Alignment. A laser grade control system shall be used during trench construction and placement.

Departure from and return to established grade shall not exceed 3/8 inch per foot (10 mm/m) and maximum departure shall not exceed 1 inch (25 mm). Maximum departure from established alignment shall not exceed 2 inches (50 mm) on tangents and 4 inches (100 mm) on curves. Departure from and return to established alignment shall not exceed 1/4 inch per foot (20 mm/m).

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If the departure exceeds the maximum allowed, the work shall be stopped and the necessary adjustments made. The affected portions of the conduit with excessive departure shall be removed and replaced at the alignment and grades shown on the Plans.

306-9.9 Rejection. CIPCP will be rejected for any of the following reasons:

a) Longitudinal cracks exceeding 10 mils (250 μm) in width and 12 inches (300 mm) or greater in length unless repaired in conformance with 306-9.6. If longitudinal cracks occur intermittently in 25 percent or more of a reach of pipe, the pipe shall not be repaired and shall be removed and replaced.

b) Circumferential cracks exceeding 10 mils (250 μm) in width and 12 inches (300 mm) or greater in length unless repaired in conformance with 306-9.6.

c) Longitudinal cracks exceeding 1/1000 the internal diameter or a maximum 1/16 inch (1.5 mm) in width.

d) Rock pockets, honeycombing, blisters, voids, or other defects that extend through the pipe wall.

e) A wall thickness less than the minimum shown in Table 306-9.8.3.

f) A diameter that does not conform to the requirements specified in 306-9.8.2.

g) Application of any wash coat of cement, grout, or other material prior to re-inspection after backfill has been placed.

h) Air bubble voids on the interior surface of the pipe exceeding 1/4 inch (6 mm) in depth unless pointed with mortar or other approved material.

i) Unpaired offsets or indentations, including transverse and longitudinal form offsets exceeding those allowed in 306-9.8.4.

j) Deviation or departure from true grade or alignment exceeding that allowed in 306-9.8.5.

k) Concrete used that has a slump of less than 1 inch (25 mm) or more than 3 inches (75 mm) as specified in 306-9.2. Concrete that has had water added after slump and/or cylinder samples have been taken or that does not meet the proportioning requirements of 201-1.

l) Concrete that has core strengths less than specified in 306-9.2.

m) The pipe does not pass the load test specified in 306-9.7.4.

n) The pipe has been damaged in any manner.

o) Concrete that was placed when the concrete temperature exceeded 90°F (32°C) or was less than 50°F (10°C), or when the soil adjacent to the trench was at or below 32°F (0°C).

p) The trench does not provide full, firm, and uniform support over the bottom 210 degrees of the pipe or the trench width exceeds the outside diameter by more than 2 inches (50 mm), except when meeting the requirements of 306-9.3.2, 9.3.3, and 9.3.4.

q) The interior of the pipe is not at least as smooth as a steel trowel finish except for the form lap ridges.

306-10 PRECAST REINFORCED CONCRETE STRUCTURES

306-10.1 Precast Reinforced Concrete Box (PRCB).

306-10.1.1 General. These specifications cover the construction of single-cell PRCB sections intended to be used for the conveyance of stormwater. PRCB sections shall conform to 216.

306-10.1.2 Repairs. PRCB sections damaged due to imperfections in fabrication or handling shall be repaired by a method approved by the Engineer.

306-10.1.3 Subgrade. Unsuitable subgrade material shall be removed to the depth shown on the Plans or determined by the Engineer and replaced with leveling bed material. Voids below subgrade

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shall be filled with leveling bed material prior to densification. Subgrade material shall be compacted to a minimum of 90 percent relative compaction.

306-10.1.4 Leveling Bed Material. Leveling bed material shall conform to 216-2.4 and be compacted to a minimum of 90 percent relative compaction.

306-10.1.5 Installation. PRCB shall be laid up-grade with the groove ends up-grade unless otherwise approved by the Engineer. Connections shall be constructed as shown on the Plans.

At the close of work each day, or whenever the work ceases for any reason, each end shall be securely closed as approved by the Engineer.

306-10.1.6 Joints.

306-10.1.6.1 Tongue-and-Groove Joints. Tongue and groove joints shall be constructed in accordance with 306-7.3.2.1 modified as follows:

a) Only one end shall be beveled for PRCB sections placed on curves.

b) Concrete used to fill clear spaces more than 1 inch (25 mm) and less than 3 inches (75 mm) shall be Class 560-C-3250 (330-C-23) conforming to 201-1 or Class "C "mortar conforming to 201-5 unless otherwise specified in the Special Provisions.

c) Joint shall be sealed by one of the following:

i) Preformed flexible joint sealant conforming to ASTM C990 or AASHTO M198. Preformed flexible joint sealant shall be installed in accordance with the manufacturer's specifications on the tongue and groove, in order to fill the joint annular space on the inside of the PRCB section. Flexible plastic gaskets shall not be used on PRCB pulled to provide a curve.

ii) Preformed flexible joint sealant bands conforming to ASTM C877, in conjunction with mastic or mortar, when installed in accordance with the manufacturer's specifications.

306-10.1.6.2 Profile Gasket (Single Offset) Joints. Profile gasket joints shall contain a gasket conforming to 208-3 unless otherwise specified. The gasket shall be the sole element responsible for watertightness of the joint.

The slope of the longitudinal gasket contact surfaces of the joint shall not exceed 2 degrees with respect to the longitudinal axis of the pipe. The gasket shall be uniformly stretched and equally tensioned around the spigot end of the joint. Lubrication of the joint and assembly shall be in accordance with the manufacturer's specifications.

306-10.1.6.3 Acceptance Testing. The pipeline shall be tested in accordance with 306-7.8.

306-10.1.7 Structure Backfill. Structure backfill material shall conform to 217-3. Structure backfill placement shall conform to 300-3.5.1. Structure backfill material shall be placed 12 inches (300 mm) from the top and 24 inches (600 mm) from each side.

306-10.2 Precast Reinforced Concrete Manholes (PRCMH).

306-10.2.1 General. These specifications cover the construction of precast reinforced concrete manholes intended for the conveyance of stormwater and wastewater. PRCMH shall conform to 215.

306-10.2.2 Repairs. Damaged PRCMH shall be repaired by a method approved by the Engineer.

306-10.2.3 Subgrade. Unsuitable subgrade material shall be removed to the depth shown on the Plans or determined by the Engineer and replaced with leveling bed material. Voids below subgrade shall be filled with leveling bed material prior to densification. Subgrade material shall be compacted to a minimum of 90 percent relative compaction.

306-10.2.4 Leveling Bed Material. Leveling bed material shall conform to 216-2.4.

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306-10.2.5 Installation.

The PRCMH base shall be set onto subgrade or leveling bed material and checked for proper elevation and orientation to receive the incoming and outgoing pipes at the invert elevation. The top of the manhole base shall be level in both directions.

PRCMH sections shall be constructed on a cast-in-place concrete base where shown on the Plans. The cast-in-place concrete base shall be constructed on subgrade prepared in accordance with 303-1.2.

306-10.2.6 Joints. Joints shall be constructed in accordance with 306-7.3.2 and the following:

Tongue and groove joints shall be constructed in accordance with 306-7.3.2.1 modified as follows:

a) Concrete used to fill clear spaces more than 1 inch (25 mm) and less than 3 inches (75 mm) shall be Class 560-C-3250 (330-C-23) conforming to 201-1 or Class "C" mortar conforming to 201-5 unless otherwise specified in the Special Provisions.
b) Joint shall be sealed by one of the following:
   i) Preformed flexible joint sealant conforming to ASTM C990. Preformed flexible joint sealant shall be installed in accordance with the manufacturer's specifications on the tongue and groove, in order to fill the joint annular space on the inside of the PRCMH section.
   ii) External preformed flexible joint sealant bands conforming to ASTM C877 Type I or II, in conjunction with mastic or mortar, when installed in accordance with the manufacturer's recommendations.
   iii) Internal preformed flexible joint sealant bands conforming to ASTM C923 when installed in accordance with the manufacturer's recommendations.
   iv) Gaskets conforming to 208-3, when installed in accordance with the manufacturer's recommendations.

306-10.2.7 Pipe to Manhole Connections. Pipes to manhole connections shall conform to 208-6.

306-10.2.8 Structure Backfill. Structure backfill material shall conform to 217-3. Structure backfill placement shall conform to 300-3.5.1. Structure backfill material shall be placed 24 inches (600 mm) from each side of the structure unless otherwise specified.

306-10.2.9 Liners. Liners where shown on the Plans shall be the type specified and shall conform to 502-5.

306-11 CAST-IN-PLACE REINFORCED CONCRETE BOX (CIPRCB).

306-11.1 General. Concrete for CIPRCB shall conform to 201. The class shall conform to the requirements shown in Table 201-1.1.2 unless otherwise shown on the Plans or specified in the Special Provisions.

306-11.2 Subgrade Preparation. Subgrade preparation shall conform to 303-1.2.

306-11.3 Bedding. Unless otherwise shown on the Plans, bedding material is not required under CIPRCB.

306-11.4 Form Construction. Form construction shall conform to 303-1.3.

306-11.5 Reinforcement Placement. Reinforcement placement shall conform to 303-1.7.

306-11.6 Concrete Placement. Concrete placement shall conform to 303-1.8.

306-11.7 Form Removal.

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306-11.7.1 General. Unless otherwise specified, the periods of time specified herein are based on the use of Types II, III, IV, or V Portland cement. Forms may be removed on the following basis:

a) Outside forms and inside wall forms which do not support the slab forms: 16 hours

b) Slab forms:

i. Type II cement - 48 hours or 6 hours per foot (20 hours per meter) of span between supports, whichever is greater.

ii. Type III cement - 24 hours or 3 hours per foot (10 hours per meter) of span between supports, whichever is greater.

iii. Type V cement - 56 hours or 7 hours per foot (23 hours per meter) of span between supports, whichever is greater.

306-11.7.2 Computed Compressive Strength Method.

306-11.7.2.1 General. In lieu of form removal as specified in 306-11.7.1, form removal may be based on the following.

If the walls and top slab of the box structure are placed monolithically, the forms may be removed when the concrete has attained the compressive strength as computed from the following formula:

$C_{US} = 20\ S + 1000$ For U.S. Standard Measures

($C_{SI} = 0.45\ S + 7$ For Metric Units)

Where S = Span length in feet (meters) from center to center of supports (maximum span 20 feet (6 m) unless otherwise approved by the Engineer).

Where C_{US} (C_{SI}) = Required compressive strength in pounds per square inch (MPa) of the concrete as determined in accordance with the requirements below:

If the top slab is not placed monolithically with side walls and if the wall forms do not support the top slab forms, the forms for the walls may be removed when the concrete has attained a compressive strength of 1,000 pounds per square inch (7 MPa). The forms for the top slab may be removed when the concrete has attained a compressive strength equal to that computed by the above formula; provided that the concrete in the walls has attained a compressive strength at least equal to that determined for the top slab at the time it is proposed to remove the top slab forms.

The strengths at which the Contractor may remove forms in the walls and top slab of box sections are permissive only, and subject to the Contractor assuming all risks that may be involved in such removals. No allowance for external loads is included in the specified strength.

306-11.7.2.2 Testing Requirements. The Contractor shall be responsible for determining when concrete placed in the forms has attained the compressive strength specified for form removal by means of tests on specimens made from the concrete placed in the forms. The Contractor shall make such number of 6-inch diameter by 12-inch high cylindrical test specimens as may be required to determine whether the specified strength has been attained; however, the number of specimens shall be such as to allow a minimum of 3 specimens to be tested at any one age. The Contractor shall furnish at its own expense, all equipment, material, supplies and labor for performing field tests which will be used as a basis of determining when forms may be removed or stripped. Forms shall not be removed until approval therefor has been given by the Engineer.

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The equipment, materials and supplies to be furnished shall include, but not be limited to, molds, tamping rods, sulfur capping compound, capping compound warmer, a capping device and a compression testing machine.

The specimens shall be made in the presence of the Engineer, during every concrete pour for which stripping strengths are required, by taking representative samples of fresh concrete, directly from the mixer, and placing such concrete into suitable molds where it shall be rodded into place. The specimens shall be made in accordance with ASTM C31. Specimens shall be made and stored on a casting board made of 5/8-inch plywood measuring 21 inches x 21 inches.

The specimens shall be covered by a box fabricated of 1/2-inch plywood measuring 21 inches x 21 inches x 15-1/2 inches high, outside dimensions. During the period of November 1 to May 31, inclusive, said casting board and box shall be insulated with an inside covering of 1/2-inch thick styrofoam or other material approved by the Engineer. No insulation shall be used during the period of June 1 to October 31, inclusive. The use of plastic sheets, light bulbs or other heating devices, inside or outside of the box, will not be permitted. Not more than 3 specimens shall be stored within the box at any one time.

The box and board containing the 3 specimens shall be stored near the point of sampling, either on hardened concrete adjacent to the freshly placed concrete, or on the ground surface adjacent to the freshly placed concrete.

At an appropriate time, prior to loading, the specimens shall be removed from the box and moved to the location where the capping equipment and compression testing machine are kept; however, under no circumstances shall specimens be stored in the box for a period greater than 24 hours. At the aforementioned location, the specimens shall be removed from the molds and capped with a sulfur capping compound in accordance with the methods of ASTM C31. After the caps have hardened, the specimens shall be loaded to failure in a compression testing machine, in the presence of the Engineer, in accordance with ASTM C39. The compressive strength of each specimen shall be calculated by dividing the maximum load carried by the specimen during the test by the average cross-sectional area, and the result expressed to the nearest 10 pounds per square inch. The compressive strength of the concrete represented by the specimens shall be taken as the average compressive strength of 3 specimens tested at the same age except that if one specimen in a test shows manifest evidence of improper sampling, molding or testing, it shall be discarded and the remaining 2 strengths averaged. Should more than one specimen representing a given test show definite defects due to improper sampling, molding or testing, the entire test shall be discarded.

In the event specimens are to be tested at ages greater than 24 hours, the specimens shall be taken from the box at an age of 24 hours, removed from the molds when the forms are stripped, and stored at the location where the capping equipment and compression testing machine are kept, where they shall receive, insofar as is practicable, the same exposure and/or protection from the elements as the portions of the structure which they represent, until the time of testing.

The completed specimens may be tested by a testing laboratory approved by the Engineer; however, forms shall not be stripped until the Engineer has been furnished with the results of the tests and until approval has been given by the Engineer to remove the forms.

In the event that the compressive strength as determined from the cylinder tests is less than that required for form removal, and the Contractor does not have sufficient specimens to perform additional tests, then the Contractor shall wait 4 hours for each 100 pounds per square inch that the compressive strength is below that required before removing the top slab forms.

306-11.8 Surface Finishes. Surface finishes shall conform to 303-1.9.

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306-11.9 Curing. Curing shall conform to 303-1.10.

306-11.10 Structure Backfill. Structure backfill material shall conform to 217-3. Structure backfill placement shall conform to 300-3.5.1. Structure backfill material shall be placed 12 inches (300 mm) from the top and 24 inches (600 mm) from each side of the CIPRCB.

306-12 BACKFILL.

306-12.1 General. Trench backfill material shall conform to 217-2. Backfill for prefabricated gravity and pressure pipe, cast-in-place non-reinforced concrete pipe, and prefabricated reinforced concrete box shall be considered as starting at the top of the bedding zone. Backfill for cast-in-place reinforced concrete box shall be considered as starting at the top of the structure backfill. For concrete encasement, the backfill shall be considered as starting at the top of the concrete encasement.

Backfill shall be considered as starting at the subgrade for cast-in-place reinforced concrete box and structures.

Except where a pipe must remain exposed for a force main leakage test and subject to the provisions herein, the Contractor shall proceed with backfilling operations as soon as possible. Care shall be exercised so that the conduit will not be damaged or displaced. If a pipe is supported by concrete bedding that does not cover the pipe, the remainder of any bedding material shall be placed to 1 foot (0.3 m) over the top of the pipe. Backfill above concrete bedding shall not be placed nor sheeting pulled until the concrete bedding has been cured per 201-1.

The Contractor may place backfill or structure backfill against or over the top of any cast-in-place structure in accordance with Table 306-12.1, unless otherwise specified in the Special Provisions.

TABLE 306-12.1

Operation	Location	
	Against Sides of Structures (Days)	Over Top of Structure (Days)
Placement of Loose Backfill	5	21
Densification of Backfill	7	28[1]

1. Or 100 percent of the specified compressive strength.

Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, the voids remaining after the removal of the boulders shall be backfilled and compacted as approved by the Engineer.

Voids left by the removal of sheeting, piles and similar sheeting supports shall be immediately backfilled with clean sand which shall be jetted or vibrated into place to ensure dense and complete filling of the voids.

Compaction shall be performed immediately after each lift of backfill is placed.

When the depth of cover of the top pipe or cable is less than 30 inches (750 mm), the top 24 inches (600 mm) of backfill, measured from the surface, shall be compacted to 90 percent relative compaction.

If the Engineer determines that it is not practical to attain the required compaction by mechanical methods, or jetting, such as in areas around utilities, vaults, or other structures, trench backfill slurry per Table 201-1.1.2 will be required.

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306-12.2 Backfill for Narrow Trenches. Narrow trenches are defined as 10 inches (250 mm) or less in width. Backfill for narrow trenches shall be placed in accordance with 306-1.12.1 except as modified herein. Narrow trenches shall be backfilled by the use of trench backfill slurry conforming to 201-1 or CLSM conforming to 201-6, unless otherwise approved by the Engineer.

When narrow trenches are backfilled using trench backfill slurry or CLSM, the Contractor may place the material in a single lift using vibrators for consolidation. The top of the trench backfill slurry or CLSM shall be placed flush with the top of the pavement when steel plates are not placed. The trench backfill slurry or CLSM shall be cut back to a minimum of 1 inch (25 mm) but no greater than 8 inches (200 mm) below the existing pavement prior to placing permanent paving. For trenches 6 inches (150 mm) or less in width, the compacted thickness of asphalt concrete shall be 3 inches (75 mm).

Backfill to be mechanically compacted in narrow trenches shall be placed in accordance with 306-1.12.3, except as modified herein. Backfill shall not have any rocks greater in any dimension, than 1/4 the width of the trench. In-place density for narrow trenches will be determined in accordance with ASTM D2937 or by a method approved by Engineer.

306-12.3 Mechanically Compacted Trench Backfill.

306-12.3.1 General. Backfill shall be mechanically compacted by means of tamping, sheepsfoot, pneumatic tire, or vibrating rollers, or other mechanical tampers. Such equipment shall be of the size and type approved by the Engineer. Impact-type pavement breakers ("stompers") will not be permitted over or adjacent to pipe, duct, or cable, unless otherwise approved by the Engineer.

Permission to use specific compaction equipment shall not relieve the Contractor from responsibility to ensure that the use of such equipment will not result in damage to adjacent ground, existing improvements, or improvements constructed under the Contract. The Contractor shall make its own determination in this regard.

Each lift of backfill shall be uniformly spread, moistened (or dried, if necessary), and then compacted until the specified relative compaction has been attained.

Unless otherwise approved by the Engineer, material for mechanically compacted backfill shall be placed in lifts which, prior to compaction, shall not exceed the thickness specified below for the various types of equipment:

a) Impact, free fall, or "stomping" equipment- maximum lift thickness of 24 inches (600 mm)

b) Vibratory equipment, including vibratory plates on backhoe dipsticks, vibratory smooth-wheel rollers, and vibratory pneumatic-tired rollers - maximum lift thickness of 18 inches (150 mm).

c) Rolling equipment, including sheepsfoot (both vibratory and nonvibratory), grid, smooth-wheel (nonvibratory), grid, smooth wheel (nonvibratory), and segmented wheels - maximum lift thickness of 8 inches (200 mm).

d) Hand-directed mechanical compactors such as vibratory plates or tamper - maximum lift thickness of 4 inches (100 mm).

306-12.3.2 Compaction Requirements. Unless otherwise specified in the Special Provisions, mechanically compacted trench backfill shall be compacted to the following minimum relative compaction:

a) 85 percent relative compaction:

   1) In the bedding zone.

   2) Outside the traveled way and other paved areas (or areas to receive pavement).

   3) Under sidewalks.

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b) 90 percent relative compaction:

1) In the upper 3 feet (0.9 m) measured from the pavement surface (or finish grade where there is no pavement), within the existing or future traveled way, shoulders, and other paved areas (or areas to receive pavement).

2) Within engineered embankments.

3) Where lateral support is required for existing or proposed structures.

c) 95 percent relative compaction where required by 301-1.3.

306-12.4 Jetted Trench Backfill.

306-12.4.1 General. Trench backfill to be compacted by water shall be jetted. Flooding will not be permitted. Jetting will be permitted only if so specified in the Special Provisions.

Jetting shall be accomplished by the use of a jet pipe to which a hose is attached, carrying a continuous supply of water under pressure.

Backfill shall be jetted in accordance with the following requirements:

a) The jet pipe shall consist of a minimum 1-1/2 inch (38 mm) diameter pipe to which a minimum 2-inch (50 mm) diameter hose is attached at the upper end. The jet shall be of sufficient length to project to within 2 feet (0.6 m) of the bottom of the lift being densified.

b) The Contractor shall jet to within 2 feet (0.6 m) of the bottom of the lift and apply water in a manner, quantity and at a rate sufficient to thoroughly saturate the thickness of the lift being densified. The jet pipe shall not be moved until the backfill has collapsed and the water has been forced to the surface.

c) The lift of backfill shall not exceed that which can be readily densified by jetting, but in no case shall the undensified lift exceed 15 feet (4.5 m).

d) The Contractor shall make its own determination that jetting will not result in damage to adjacent structures or facilities. Any resulting damage shall be repaired at the Contractor's expense.

e) The Contractor shall have available a continuous supply of water at a minimum pressure of 40 pounds per square inch (275 kPa) gage. If a water truck is used to supply water, it shall have a pump capable of supplying water at 40 pounds per square inch (275 kPa) gage and shall have the capacity to jet the trench without refill.

f) After jetting trench backfill, the Contractor shall prepare the top of the backfill to provide a firm and unyielding subgrade conforming to 301-1. Jetting maybe supplemented with mechanical methods.

306-12.4.2 Compaction Requirements. Unless otherwise specified in the Special Provisions, trench backfill compacted through jetting shall be densified to the following minimum relative compaction:

a) 85 percent relative compaction:

1) From the bottom of the trench to the beginning of the upper 3 feet (0.9 m), measured from the pavement surface (or finish grade where there is no pavement) within native material or unengineered embankments.

2) Outside the traveled way, shoulders, and under sidewalks, in the upper 3 feet (0.9 m), measured from the pavement surface (or finish grade where there is no pavement).

3) Under sidewalks.

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b) 90 percent relative compaction:

1) In the upper 3 feet (0.9 m), measured from the pavement surface (or finish grade where there is no pavement), within the existing or future traveled way, shoulders, and other paved areas (or areas to receive pavement).

2) Within engineered embankments.

3) Where lateral support is required for existing or proposed structures.

c) 95 percent relative compaction where required by 301-1.3.

306-12.5 Backfill for Cast-In-Place Non-Reinforced Concrete Pipe (CIPCP). Backfill for CIPCP shall be considered as starting at the top of the trench form. The method of backfilling shall be subject to the approval of the Engineer. The equipment used in placing the backfill shall not cause damage to the pipe or cause loads to be placed on the pipe which are in excess of design loads.

Backfilling will not be permitted over CIPCP until the required 28-Day compressive strength has been attained. The Contractor may place backfill prior to 28 Days upon written approval by the Engineer provided the required 28-Day strength has been attained and verified by a laboratory.

306-13 TRENCH RESURFACING.

306-13.1 Temporary Resurfacing. Unless permanent pavement is placed immediately, temporary resurfacing 2 inches (50 mm) thick shall be placed and maintained wherever excavation is made through pavement, sidewalk or driveways. In sidewalk areas the temporary resurfacing shall be at least 1 inch (25 mm) thick; in all other areas it shall be at least 2 inches (50 mm) thick. Temporary resurfacing shall be placed as soon as the condition of the backfill is suitable to receive it and shall remain in place until the condition of the backfill is suitable for permanent resurfacing.

The asphalt concrete mixture used for temporary trench resurfacing shall conform to Class D2 asphalt concrete conforming to 203-6.4.3; and liquid asphalt conforming to grade SC-800 shown in Table 203-2.4.

The mixture may be furnished from stockpiles or directly from the plant, and may be laid cold. Prior to placing temporary resurfacing, the Contractor shall level and compact the backfill on which the surfacing is to be placed. The grade of the backfill on which the resurfacing is to be placed shall provide the full thickness of temporary resurfacing specified. The temporary resurfacing shall be placed, rolled, maintained, removed, and disposed of by the Contractor.

306-13.2 Permanent Resurfacing. Unless otherwise specified, surface improvements damaged or removed as a result of the Contractor's operations shall be reconstructed by the Contractor to the same dimensions, except for the pavement thickness, and with the same type of materials. Trench and excavation resurfacing shall be 1 inch (25 mm) greater in thickness than existing pavement.

Subgrade for trench resurfacing shall conform to 301 and the pavement reconstruction shall comply with the applicable provisions of 302. Aggregate base, when encountered within the structural section area, shall be compacted to a minimum relative density of 95 percent and compacted in lifts in accordance with 301-2.2. The thickness of aggregate base shall be equal to that existing adjacent to the excavation.

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306-13.3 Placement of Permanent Repair Hot Mixed Asphalt Concrete. The asphalt concrete shall be placed in compacted lifts as shown in Table 306-13.3.

TABLE 306-13.3

Compaction Equipment	Maximum Compacted Thickness, inches (mm)
Vibratory Plate	1-1/2 (38)
Pneumatic Plate	2 (50)
Vibratory Rammers	2 (50)
Steel Wheel Roller[1]	2-1/2 (63)
Vibratory Roller[1]	3 (75)
Pneumatic Tired Rollers	Not Permitted

1. Rollers must fit entirely within the trench.

After placement of the backfill and/or aggregate base, the sides of the excavation shall be cleaned prior to the application of an asphalt tack coat. The tack coat may be an emulsified asphalt conforming to 203-3 or a paving asphalt conforming to 203-1. The tack coat when cured or cooled shall be of sufficient thickness to uniformly and completely cover the vertical surfaces of the existing asphalt concrete. Excess tack on the horizontal surface of the aggregate base or subgrade shall be spread uniformly over the surface and may require the application of a blotting sand to prevent bleed through. Areas that are not sufficiently coated shall have the tack re-applied. The Contractor shall ensure that the tack coat is not damaged during the placement of the asphalt concrete.

306-13.4 Base Course for Asphalt Concrete Placement. The base course shall be a B or C gradation and shall be placed by either a spreader box, paving machine or "shoe" attachment.

For trenches less than 3 feet (1 m) wide and individual excavations or bore holes having an area of less than 50 square feet (5 m^2), the base course pavement shall be placed in such a manner as to obtain the specified density and smoothness.

The compacted surface shall not deviate from the planned base course elevation by more than 1/4 inch (6 mm).

306-13.5 Finish Course for Asphalt Concrete Placement. The finish course shall be a C or D gradation. For trenches 8 feet (2.5 m) or greater in width, the final lift of asphalt concrete shall be placed with a paving machine or a full width spreader box. When the total tonnage required for the final lift of asphalt concrete is greater than 110 tons (100 tonnes), a paving machine shall be used.

For trench widths 3 feet (1 m) or greater and less than 8 feet (2.5 m), the final lift shall be placed with a narrow paving machine or a spreader box when the total tonnage required for the final lift of asphalt concrete is greater than 17 tons (15 tonnes).

For trenches less than 3 feet (1 m) wide and individual excavations or bore holes having an area of less than 50 square feet (5 m^2), the final lift shall be placed in such a manner as to obtain the specified density and smoothness.

306-13.6 Density and Smoothness. For trench widths of 3 feet (1 m) or greater, the Contractor shall compact each lift with a self-propelled steel wheeled roller conforming to the PLI (N/mm) requirement specified in 302-5.6.

For trench widths of less than 3 feet (1 m), the Contractor shall compact each lift by steel wheel rollers, vibratory plates, or rammers of such width to fit within the sides of the excavation. The PLI (N/mm) requirements of 302-5.6 shall not apply except for the final lift. The final lift shall be compacted using a steel wheel roller conforming to the PLI (N/mm) requirements of 302-5.6.

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For individual excavations or bore holes having an area of less than 50 square feet (5 m^2), the Contractor shall compact each lift by steel wheel rollers, vibratory plates, or rammers of such width to fit within the sides of the excavation. The PLI (N/mm) requirements of 302-5.6 shall not apply.

Pneumatic tire rollers or truck tires shall not be used to compact any of the lifts.

Trenches of any width backfilled with CLSM or trench backfill slurry will not require aggregate base. Asphalt concrete shall be replaced to the full-depth of existing asphalt concrete plus 1 inch (25 mm), except for trenches specified in 306-12.4.

For trench widths 3 feet (1 m) or greater, the compaction temperatures shall conform to 302-5.6. For trench widths less than 3 feet (1 m), compaction shall be initiated before the asphalt concrete cools to less than 200°F (94°C).

The minimum compaction after rolling shall be 95 percent of the density obtained in accordance with 302-5.6.2. When the density is determined by a core sample, it shall be based on a full-depth sample, as specified in 302-5.6.2.

The final pavement surface for trenches wider than 3 feet (1 m) and parallel to the centerline of the street shall conform to the smoothness requirements specified in 302-5.6.2. Trenches less than 3 feet (1 m) wide, individual excavations or bore holes having an area less than 50 square feet (5 m^2), and trenches of any width not parallel to the centerline of the street shall match the smoothness of the existing pavement, except the final pavement surface tolerances shall be 0 to plus 1/8 inch (3 mm) based on the existing pavement on either side of the excavation. Final pavement below the existing surface will not be accepted.

Finish courses with deviations exceeding the above requirements shall be removed and replaced. Removal shall be to a minimum depth of 1-1/2 inches (38 mm) for the full-width of the trench. The minimum length of removal along the trench shall extend 4 feet (1.2 m) beyond the ends of the deviations, but in no case exceed the limit of the original excavation.

306-13.7 Concrete Resurfacing. Replacement of PCC pavement for trench or individual excavations or bore holes shall be 1 inch (25 mm) greater in thickness than the existing pavement. The concrete shall conform to and be placed per 302-6.

306-14 MEASUREMENT.

306-14.1 Shoring and Bracing. Shoring and bracing will be measured as specified in the Special Provisions or shown in the Bid.

306-14.2 Pressure Pipe. Pressure pipe will be measured in a horizontal plane along the pipe centerline between the ends as laid and shall include the length of the actual pipe in-place, including the lay-lengths of in-line tees, fittings, valves, meters and appurtenances.

306-14.3 Gravity Pipe. Gravity pipe will be measured along the longitudinal axis between the ends as laid and shall include the length of the actual pipe in place and shall not include the inside dimensions of structures. House connection sewers shall be measured from the center of the main sewer to the upper end of the house connection sewer. Catch basin connections shall be measured from the inside face of the catch basin to the inside face of conduit or structure to which connection is being made. Chimney pipe shall be measured vertically from the upper end of the chimney to the invert of the sewer.

306-14.4 Precast Reinforced Concrete Box (PRCB). PRCB will be measured along the longitudinal axis between the ends laid for each size. The length shall include the actual length of the PRCB in place but it shall not include the inside dimensions of structures.

306-14.5 Precast Reinforced Concrete Manholes (PRCMH). PRCMH will be measured vertically from the flowline to the top of the uppermost grade adjustment ring for each type shown on the Plans.

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Liners, if measured for payment, will be measured vertically from the flowline to the top of the uppermost grade adjustment ring for each type and diameter shown on the Plans.

Precast or cast-in-place concrete bases, if measured for payment, will be measured by the cubic yard (m^3) in accordance with 303-1.11.

306-14.6 Cast-In-Place Reinforced Concrete Box (CIPRCB). CIPRCB will be measured along the longitudinal axis between the ends as constructed for each size shown on the Plans. The length shall include the actual length of the CIPRCB in-place but it shall not include the inside dimensions of structures.

306-14.7 Valves, Hydrants, Buried Structures, and Pipeline Appurtenances. Pipeline appurtenances shall include backflow prevention devices, meters, water service laterals, expansion joints, and other devices specified as appurtenance Bid items in the Special Provisions or the Bid. Valves, hydrants, buried structures, and appurtenances will be measured by "each" unless otherwise specified.

306-14.8 Temporary Resurfacing. Temporary resurfacing will be measured by the ton (tonne).

306-14.9 Permanent Resurfacing. Unless otherwise specified, permanent resurfacing will not be measured separately for payment.

306-15 PAYMENT.

306-15.1 General. Payment for pipe and conduit will be made at the Contract Unit Price per linear foot (m). The Contract Unit Price shall include payment for;

a) all wyes, tees, bends, monolithic catch basin connections, and specials shown on the Plans;
b) removal of interfering portions of existing pipelines, sewers, storm drains, and improvements;
c) closing or removing of abandoned conduit and structures;
d) trench excavation;
e) control of surface waters;
f) preparation of subgrade;
g) placing and joining pipe;
h) erection and removal of forms;
i) reinforcing steel;
j) pressure testing;
k) video inspection;
l) disinfection sample collection and delivery;
m) backfilling the trench;
n) permanent resurfacing; and
o) all other work (excluding temporary resurfacing) necessary to install the pipe or conduit, complete in-place.

No separate or additional payment will be made for additional bedding or a higher strength of pipe necessitated by the Contractor exceeding the maximum trench width.

306-15.2 Shoring and Bracing. Payment for shoring and bracing will be made as specified in the Special Provisions.

306-15.3 Dewatering. Payment for dewatering will be made as specified in the Special Provisions.

306-15.4 Valves, Buried Structures, and Pipeline Appurtenances. Payment for valves, hydrants, buried structures, and pipeline appurtenances will be made at the Contract Unit Price for each item and shall include testing and disinfection.

306-15.5 Valves. Payment for valves will be made at the Contract Unit Price for each valve assembly of the size, class, and type shown on the Plans. The Contract Unit Price shall include excavation, valve, actuator, thrust

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restraint, valve supports, gaskets and fasteners, valve cans, risers, extensions, and lids, backfill, restoration of the street surface, and all other work, excluding temporary resurfacing, necessary to construct the valve complete in-place.

For air valve assemblies, the Contract Unit Price shall also include payment for concrete pads, enclosures, laterals, risers, and isolation valves shown on the Plans or specified in the Special Provisions.

306-15.6 Hydrants Payment for hydrants will be made at the Contract Unit Price for each hydrant assembly of the size, and type shown on the Plans. The Contract Unit Price shall include excavation, the hydrant, hydrant lateral, hydrant shutoff valve and actuator, thrust restraint, gaskets and fasteners, valve cans, risers, extensions, and lid, backfill, restoration of the street surface, and all other work, excluding temporary resurfacing, necessary to construct the hydrant assembly complete in-place.

306-15.7 Buried Structures. Buried structures shall include cast-in-place and precast manholes including bases, cleanouts, junction structures, lamp holes, catch basins, and other structures specified as buried structures in the Special Provisions. Payment for buried structures will be made at the Contract Unit Price for each type or size of structure shown on the Plans. The Contract Unit Price shall include excavation, backfill, constructing inverts, furnishing and installing castings, restoration of the street surface, and all other work, excluding temporary resurfacing, necessary to construct the buried structure, complete in-place.

If the Proposal does not include a Bid item for cast-in-place or precast manhole bases, payment will be considered as included in the Contract Unit Price for the Bid item(s) which require cast-in-place or precast manhole bases.

306-15.8 Pipeline Appurtenances. Payment for pipeline appurtenances will be made at the Contract Unit Price for each appurtenance of the size and type shown on the Plans, complete in-place.

Payment for backflow prevention devices will be made at the Contract Unit Price for each backflow prevention assembly. The Contract Unit Price shall include payment for excavation, backflow prevention assembly, isolation valves and actuators, thrust restraint, gaskets and fasteners, backfill, concrete pads and enclosure, restoration of the street surface, and all other work, excluding temporary resurfacing, necessary to construct the backflow prevention assembly, complete in-place.

Payment for water service laterals will be made at the Contract Unit Price for each water service lateral or meter assembly, including service tap, corporation stop, lateral, riser, angle meter valve, service saddle, meter installation, meter box or vault, meter box lid, and all other service material shown on the Plans or specified in the Special Provisions.

Payment for meters will be made at the Contact Unit Price for each meter. The Contract Unit Price shall include payment for the meter (unless furnished by the Agency) and any appurtenant couplings, meter boxes or vaults, or meter box lid for which payment is not made under another Bid item.

Payment for expansion joints will be made at the Contract Unit Price for each expansion joint. The Contract Unit Price shall include payment for each expansion joint and appurtenant thrust restraint system.

Payment for other pipeline appurtenances will be made as specified in the Special Provisions.

If the Proposal does not include a Bid item for manhole liners, payment will be considered as included in the Contract Unit Price for the Bid item(s) which require manhole liners.

306-15.9 Temporary Resurfacing. Payment for temporary resurfacing will be made at the Contract Unit Price per ton (tonne). The Contract Unit Price per ton (tonne) shall include furnishing, placing, maintaining, removing, and disposing of such temporary resurfacing materials.

Payment will be limited to that quantity of material ordered placed by the Engineer and shall include material used to maintain the temporary resurfacing until the permanent resurfacing is placed. No separate or additional payment will be made for material placed by the Contractor for its convenience.

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SECTION 8

WATER SYSTEMS

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SECTION 8
WATER SYSTEMS

8-1 INTRODUCTION

These Improvement Standards shall apply to water supply and distribution facilities to be maintained by a CSA Service Area (CSA) providing extended water services. These Standards are minimum criteria. The County Engineer may permit modifications or may require higher standards where unusual conditions are encountered. These Standards shall also apply to any privately owned and maintained system serving 4 or more residential units or any commercial or industrial uses. Where water supply and distribution facilities are to be maintained by a Community Service District or a City, the standards of the District or City shall govern the design and construction of water supply and distribution facilities.

8-2 INTENT OF WATER SYSTEM IMPROVEMENT STANDARDS

The intent of these water system improvement standards is to provide water systems that reliably and safely convey water at a reasonable capital cost and with minimum operation and maintenance costs.

8-3 DEFINITIONS

When the following terms or titles are used in these water system improvement standards, or in any document or instrument where these standards govern, the intent and meaning shall be as herein defined:

- AWWA - American Water Works Association.
- Raw Water – Untreated, non-potable water for irrigation use only.
- Recycled Water – Reclaimed treated wastewater, non-potable water for irrigation use only.
- Water System - Refers to potable, raw water, and recycled (reclaimed) water systems.

8-4 APPLICABLE STANDARDS

The most current requirements of the following agencies, regulations and standards shall apply to the design of water systems. In case of conflict between the requirements of these water system improvement standards and the agencies and documents listed below, the more stringent requirement shall govern.

- United States Environmental Protection Agency (EPA) Drinking Water Regulations.
- Laws, regulations, codes, and standards of the State of California relating to domestic water.
- Title 17, Chapter 5, California Code of Regulations, regarding cross-connections and backflow prevention.
- Title 22, Division 4, Chapter 16, California Code of Regulations, regarding California Waterworks Standards
- Permit and regulatory requirements of the State of California Department of Health Services.
- Yolo County Code Title 6, Chapter 8, Water Quality.
- Rules and regulations of Yolo County Health Department.
- General Order No. 103 of the California Public Utilities Commission.
- Uniform Fire Code.
- Latest Edition of the American Water Works Association (AWWA) standards.

8-5 WATER SYSTEM MASTER PLAN

The Developer shall provide a Water System Master Plan for the approval of the County Engineer that addresses water supply and reliability issues, and demonstrates how adequate daily service and fire protection will be provided for the project.

The Master Plan shall include, at a minimum:

1. A copy of the water assessment prepared for the project in accordance with the California Water Code Section 10910, et. seq.
2. The anticipated growth of the water system over a projected period of at least ten years in terms of the population and number and type of residential, commercial, and industrial service connections to be served by the water system.
3. Estimates of the amount of water needed to meet the total annual demand over the projected ten-year growth period (projected system demand). Methods, assumptions, and calculations used to estimate the projected system demand shall be included.
4. A map and description of the entire existing and proposed service area, showing:
   a. The location of each water source, including wells that are abandoned, out-of-service, destroyed, standby, or inactive;
   b. Any valid water rights owned by the system for surface water sources, including information on any limitations or restrictions of those rights;
   c. For a groundwater aquifer, the groundwater levels and drawdown patterns;
   d. Permits or approvals for groundwater extraction if pumping from an adjudicated groundwater basin;
   e. Existing and planned source pumping capability and distribution storage capacity for the system
   f. The calculated sustained well yields of existing wells if groundwater sources are used; as a whole and for each pressure zone;
   g. Permits, if required, for any waters proposed for use to offset potable water demand; and
   h. A Source Water Assessment for each potable water source.
5. Distribution system piping, pressure zones, hydro-pneumatic tanks, and reservoirs;
6. Valves, sample taps, flow meters, unmetered service connections, and other system appurtenances;
7. Conveyance facilities;
8. Provisions for backup power to operate facilities during extended power outages common in rural areas;
9. Any flood plains in the projected service area; and
10. The 100 year flood or highest recorded flood level, whichever is higher.

8-6 IMPROVEMENT PLAN SUBMITTAL

Improvement plans shall meet the requirements of these Improvement Standards, to the satisfaction of the County Engineer.

8-7 APPROVAL OF IMPROVEMENT PLANS

The County Engineer will approve water system improvements concurrently with any street, sewer, storm drainage or other improvements shown on the Improvement Plans. The following must occur before the plans can be approved:

- The local Fire District must approve the improvement plans as to fire flow pressure, fire hydrant spacing, and fire hydrant valve outlet configuration and sizes.

- The location of all wells in use and all abandoned wells must be shown on the improvement plans. Wells must be properly abandoned in accordance with permits issued by the Yolo County Health Department. Copies of well abandonment permits for all abandoned wells must be provided to the County Engineer prior to final acceptance of any public improvements.

8-8 IMPROVEMENT PLAN REVISION

All plan revisions that affect a water system to be maintained and operated by the County shall be approved and signed by the County Engineer prior to construction.

8-9 CONNECTION PERMITS AND FEES

A water connection and/or encroachment permit shall be obtained for each new connection to the water system. Contact Yolo County Department of Planning and Public Works for information concerning fees.

8-10 WATER QUALITY

The quality of the potable water supplied or delivered into any portions of a public water system shall conform to the applicable federal standards and State Department of Health Services Drinking Water Standards.

8-11 WATER PRESSURE

Water distribution systems shall be designed so that normal operating pressures at service connections to the distribution system are not less than 45 pounds per square inch (psi) and not more than 100 psi. During periods of maximum day domestic demand plus fire demand, the pressure shall not be less than 20 psi at the location of the fire flow and no less than 5 psi anywhere in the distribution system.

8-12 WATER DEMAND

Determination of design flow rates required for a specific land use category shall consider maximum day domestic demands occurring in conjunction with an emergency fire flow demand. For design of the water supply and distribution system, the unit demand factors shall be assumed in accordance with Table 8-1 below, in consultation with the County Engineer. Small and/or remote systems may require more stringent standards, as determined by the County Engineer.

To provide for projected growth, the County Engineer may require that distribution mains be upsized in accordance with approved Master Water Plans.

TABLE 8-1 WATER DEMAND FACTORS	
Land Use Category	**Average Day Water Demand Factors**
Single Family Residential (<6 Dwelling Units/Acre)	728 gpd/dwelling unit
Multi Family (>6 to 12 Dwelling Units/Acre)	521 gpd/dwelling unit
Commercial/Retail	2,598 gpd/ac
Business Professional/Light Industrial	2,598 gpd/ac
Industrial	2,562 gpd/ac
Railroad Yard	109 gpd/ac
Elementary Schools	3,454 gpd/ac
High Schools	4,068 gpd/ac
Public (Fire Station, etc)	1,780 gpd/ac
Park/Recreation	2,988 gpd/ac

The average day demand to maximum day demand peaking factor shall be 2.0. The maximum day demand to peak hour demand peaking factor shall be 1.7 (3.4 average day to peak hour).

8-13 FIRE FLOWS

Required fire flows shall be determined by the California Fire Code, the fire protection district having jurisdiction, and the County of Yolo. Minimum fire flows shall not be less than shown in Table 8-2 following, with a 2-hour duration:

TABLE 8-2 FIRE FLOWS	
Development Category	**Fire Flow, Gallons per Minute**
Single-Family Residential	1,500
Light Commercial	2,500
Planned Unit and Multiple Dwelling Areas	2,500
Central Business District	3,500
Industrial/Higher Value Buildings	3,500

8-14 WELLS, TREATMENT PLANT AND STORAGE FACILITY DESIGN

Where a CSA is proposed to provide wastewater treatment services, the Developer shall be responsible for all costs to create the CSA, prepare an Engineer's Report to estimate assessments, and provide engineered plans for the wells, treatment plant, and storage facility design. Such plans shall be prepared by an engineering firm retained by the Developer that 1.) has demonstrated expertise and experience designing municipal water supply, treatment, and storage systems, and 2.) is approved by the County Engineer prior to the commencement of design work.

In general, all developments must provide a minimum of two (2) demonstrated sources of water. The water supply and treatment plant shall include, but is not limited to, wells, storage tanks, pumps, hydropneumatic tanks, chemical storage and treatment equipment, backup power with automatic transfer switches, toilet facilities, safety eyewashes, conditioned office space for operations and maintenance personnel and control equipment, lighting, landscaping, landscape irrigation, and security fencing. Automatic backup power systems to operate the water system shall be provided, using natural gas where available, or propane (LPG). Operational systems shall include telemetry and SCADA systems to allow remote monitoring and operations.

Site selection for the above mentioned facilities shall be approved by the County Engineer and meet the requirements of the Yolo County Environmental Health Department and the State Department of Health Services.

8-15 DISTRIBUTION MAIN DESIGN

Sizing of distribution mains shall be such that the normal pressures stated in Section 8-11 and the minimum requirements as stated below for distribution main spacing and sizing are maintained. The Hazen-Williams formula shall be used in the hydraulic study of the system, using a "C" value of 125 for polyvinyl chloride pipe and cement-lined ductile iron pipe.

A Hardy-Cross hydraulic analysis of any proposed distribution system shall be provided to the County Engineer. In design of the system, the maximum assumed delivery from any hydrant shall be assumed to be limited to 1,500 gallons per minute.

A. Distribution Main Design Plan Requirements: Plans for the construction of water mains whether in conjunction with other improvements or for a water project only, shall conform to the following standards, as well as other provisions contained in these Improvement Standards.

1. The distribution main shall be shown on the Street Plan and Profile sheets, and for non-street areas on separate plan and profile sheets as required.
2. Details of distribution mains crossing within 15" of other utilities, or unusual alignments, will be provided if deemed necessary by the County Engineer.
3. A sand bedding shall be provided around all water mains (6 inches minimum all directions), regardless of pipe material type. If existing soil is too porous to hold sand, a geotextile fabric placed on the trench bottom and covered with 6 inches of sand may be used. Bedding and backfill shall be compacted to 95% relative compaction. Grooves shall be dug in the pipe bedding to accommodate pipe bells, fittings, and joints so that the pipe is continuously supported by the bedding material.
4. Stationing for all fittings, shut off valves, air release/vacuum valves, and in line blow-off valves shall be called-out in the profile view of the improvement plan sheets. Elevations shall be called-out at all changes in pipe elevation. Horizontal alignment changes shall be called out on the plan view.
5. Commercial, industrial, and apartment Improvement Plans with a water easement shall have a note that states, "Utilities may not be located within water easement(s) except if the utility crosses the water easement within 20 degrees of perpendicular to the water main."

B. Distribution Main Location: All water distribution mains shall be installed within public rights-of-way or easements.

1. In new subdivisions, the centerline of the water main shall be located six feet north or west of street centerlines within minor and primary streets. If a street loops 180 degrees or more it is not necessary for the water main to cross to the other side of the street to meet this requirement.
2. If it is necessary to install a water distribution main within a private road, the water easement shall be the width of the paving plus one foot each side. Water easements over water distribution mains located on commercial, industrial, or apartment properties shall have a minimum width of 15 feet. The water main shall be centered in the easement.
3. If it is necessary to install a water distribution main within a landscape corridor, then no trees shall be planted within five feet of the water main. The water distribution main shall be centered within a 15 foot wide water easement. The landscape plans for the corridor shall be submitted prior to approval of the improvement plans.
4. If a water distribution main is required to be installed between residential homes, the pipe material shall be Class 350 Ductile Iron Pipe, and a 6 inch wide warning tape shall be placed on the backfill. The center of the main shall be centered within a 15 foot wide easement.
5. Ten (10) feet shall be the minimum horizontal distance between the exterior surfaces of parallel water distribution and sanitary sewer mains or recycled water mains. The water distribution main shall be higher than the sewer main or recycled water main. Separation may be less if it is accordance with California State Department of Health Services requirements and approved by the County Engineer.
6. On all utility crossings, the water distribution main shall maintain a separation or clearance of at least 12-inches (1 foot) from the utility.
7. When crossing over a sanitary sewer force main, it shall be specified that the water distribution main be installed a minimum of three (3) feet above the sewer line and be ductile iron.
8. Water distribution mains to be installed in public right-of-ways or easements not conforming to the items above shall be approved by the County Engineer in consultation with other affected utility providers.

C. Distribution Main Layout and Sizing: The distribution system, whenever possible, shall be in grid form so that pressures throughout the system tend to become equalized under varying rates and locations of maximum demand, and to provide system redundancy. The minimum pressures and flows as specified shall govern design of the system. The following conditions are to be considered for the distribution system design:

1. The minimum pipe size shall be eight inches inside diameter.
2. Where distribution mains are installed in an arterial street, dual mains (one pipeline on each side of the street) may be required.
3. Mains shall maintain a minimum cover of 36-inches, and when not avoiding other utilities mains shall have a maximum depth of 60-inches, unless otherwise specified by the County Engineer. Both distances shall be measured from finish grade. Mains shall be located a minimum of 24" from the subgrade of the street pavement section.

D. Distribution Main Pipe Restraint: Pipes shall be restrained from movement as a result of thrust on the fittings and valves of the water system. Thrust restraint for bends and tees may be accomplished with thrust blocks as shown in Standard Drawing 8-3, or by means of pipe joint restraining devices such as Star Pipe Products, Stargrip® Series 4000, or equivalent. Thrust blocks must be poured against undisturbed soil.

E. **Type of Distribution Main Pipe and Pipe Deflection:** Water mains up to 12" diameter shall be Class 200 AWWA C900 Polyvinyl Chloride. Ductile iron pipe (DIP) for crossings shall be manufactured to conform to ANSI/AWWA C-150/21.50 thickness design of ductile iron pipe and to "Ductile Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water and Other Liquids" (ANSI/AWWA C-151/A21.51) and shall be cement-mortar lined in accordance with the standard for "Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water" (ANSI/AWWA C-104/A21.4). All DIP shall be encased in clear, 4-mil HDPE sleeves, installed in accordance with these Improvement Standards and the standard for "Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids" (ANSI/AWWA C-105/A21.5).

Pipe curvature induced due to bending PVC pipe shall exceed 140% of the manufacturer's minimum recommended bending radius. Bending of Polyvinyl Chloride pipe shall not exceed the limits described in Standard Drawing 8-9.

F. **Distribution Main Valves:** Valve clusters shall be placed at all pipe intersections with a valve on each leg of the main. Gate valves shall be used on 12" diameter and smaller mains. Butterfly valves shall be used on all larger size mains. Valves shall be placed in between main line intersections at intervals of 500 feet between valves.

8-16 WATER SYSTEM APPURTENANCES

Water system appurtenances include fire hydrants, water service lines, water meters, detector check valves, and back-flow devices.

A. **Fire Hydrants and Blow-off Assemblies:** Fire hydrants and blow-off assemblies shall be located as follows:

1. Fire hydrants shall be connected to distribution mains only.
2. Fire hydrants shall be placed at street intersections wherever possible, and located to minimize the hazard of damage by traffic. They shall have a maximum normal spacing of 500 feet measured along the street frontage in residential developments, 300 feet in commercial developments, or as otherwise approved by the local Fire District. Hydrants located at intersections shall be installed at the curb return. Within residential areas, all other hydrants shall be located on property lines between lots. See Standard Drawing 8-2 and typical installation details.
3. The minimum size lateral serving a fire hydrant shall be six inches in diameter provided the distance from the nearest intersecting main to the hydrant shall not be greater than 50 feet if fire flow requirements are 1500 gpm, or 10 feet if fire flow requirements are greater then 1500 gpm. The lateral pipeline connecting the hydrant and the main shall have a gate valve flanged to the main.
4. A fire hydrant or four (4)-inch blow-off assembly shall be installed on all permanent dead-end runs including cul-de-sacs. If the local Fire District requires a hydrant at the end of a dead-end run, then a 4-inch Blow-off assembly will not be allowed. Two-inch Blow-off valves shall be used if dead-end runs are temporary. Wherever possible, the blow-off assemblies shall be installed in the street right-of-way, a minimum distance of three (3) feet from the lip of gutter, or behind the sidewalk. In no case shall the location be such that there is a possibility of siphoning into the distribution system. See Standard Drawings 8-12, and 8-13 for specifications and typical installation details.

B. Water Service Lines: Service lines from the water distribution main to the property line or edge of easement shall always be installed at the time the main is constructed. Services from mains installed in private roads shall extend one foot beyond the edge of the pavement, sidewalk, curb and gutter. Service line criteria shall be as follows:

1. In all new subdivisions, the service line shall be located 5 feet from the side property line, and the meter box assembly shall be located outside of the flowline of any proposed sideyard swales or areas subject to ponding.
2. The minimum size of a new residential service line and meter shall be one and one-half inches (1-1/2") in diameter. Schools, commercial, industrial, or multiple-family units with higher water demand shall be provided with larger service lines, subject to approval of the County Engineer. All services shall be installed with a corporation stop at the main and valve at the property line. The property line valve shall be the angle meter stop (2" and smaller services) or a gate valve (services larger than 2") at the water meter whenever possible.
3. The Contractor shall make all water service taps into existing mains upon application for a permit and payment of the required fees. A note to this effect shall be placed on the plan sheet which details the area that requires such tapping. Application should be made to County of Yolo Planning and Public Works Department and the required fees paid at least five (5) days in advance of the time the tap is desired. The Contractor shall perform all work subject to inspection and acceptance by the County Engineer.
4. All services up to two inches in diameter shall be Type K soft copper. All larger services shall be the same material as the water main. No joints shall be allowed in service lines.
5. The location of all water services shall be permanently marked with a 2" tall "W" wet-stamped into the face of the concrete curb.

C. Water Meters: The developer shall provide meters and a complete automated meter reading system (meters, radio-read transmitters, remote transceivers, software, etc). Water meters shall be installed on all residential, commercial, industrial, multi-family, and irrigation water services. Meter boxes with an idler will be installed by the developer. Meters will be provided by the developer for installation by the builder after building permits are issued. Meter boxes shall be set above the back of walk as required to provide for drainage away from the box and shall be adjusted, as needed, to final grade by the building contractor. Size of water meter shall not be less than the size of the service line unless approved by the County Engineer. See Standard Drawing 8-6 for specifications and typical installation details.

D. Fire Department Connection: A backflow prevention device shall be provided for each fire service line into a building, whether residential, commercial or industrial use. See Standard Drawing 8-7 for specifications and typical installation details. The Fire District or Department will review and approve all connection details. Contact the Fire District or Department for requirements based on specific uses, and field testing requirements. Prior to acceptance a copy of the test certification/report from an AWWA certified private Certified Backflow Prevention Assembly Tester shall be required for each devise.

E. Back-Flow Devices: Back-flow devices are required in accordance with Title 17, Chapter V, and Sections 7583-7622 of the California Code of Regulations. See Standard Drawing 8-8 for specifications and typical installation details. Prior to acceptance a copy of the test certification/report from an AWWA certified private Certified Backflow Prevention Assembly Tester shall be required for each device.

Back-flow devices shall be provided with an insulating blanket and lockable metal enclosure, GuardShack™, or equivalent meeting the following requirements:

1. Manufactured with minimum 1¼" schedule 40 metal pipe (A.S.T.M.-A-53 Gr.A.E.W). All sharp corners on top of the enclosure shall be eliminated by using pipe formed to a 6" radius for 12" wide enclosures and a 9" radius on all 18" wide or wider enclosures.
2. Expanded metal shall be ½" spacing, #13 gauge flattened diamond pattern steel. Expanded metal shall be "die-formed" for uniformity. There shall be no exposed ends of expanded metal on the outside of the enclosure.
3. Welding shall be a minimum of ¼" along weld on 4" spacing.
4. Enclosure shall be powder coated with dark green color, subject to the approval of County Engineer.

F. Air Release/Vacuum Valve Assemblies: Air release/vacuum valve assemblies are required at high points in a distribution system as determined by the County Engineer. See Standard Drawing 8-14 for specifications and typical installation details. Air release valve boxes shall be located at least 5 feet away from driveways, and shall be protected with bollards as required by the County Engineer.

G. Polyethylene Wrapping:
All valves, fittings, DIP, copper and underground brass shall be wrapped and sealed in an 8-mil minimum thickness polyethylene encasement. Use pipe wrap tape to secure and seal to the polyethylene encasement. Damaged or scratched surfaces on epoxy coated valves and appurtenances may be repaired with an epoxy kit per manufacturer's recommendations and to the satisfaction of the County inspector prior to wrapping. Otherwise, the damaged valve shall be replaced with a new valve.

H. Tracer wire: A continuous number 10 AWG, insulated, single strand copper tracing wire shall be attached to all mains, service lines and appurtenances per Standard Detail 8-4 and the following:
1. Tracing wire shall be continuous between mainline valve boxes and fire hydrants. It shall be attached to the top of the pipe with 10-mil polyethylene tape every 10 feet.
2. Tracing wires through valve boxes shall be brought to the surface by placing outside of riser, but inside the box.
3. Tracing wire in manholes and vaults shall be attached inside the facility within nine inches of the rim.
4. Wire splices shall be soldered and located above ground and inside of valve boxes, except for splices necessary for services.

I. Marking tape: A 12-inch wide, blue plastic non-detectable water pipe marking tape, marked "Buried Water Main Below," shall be placed in all main line trenches, 12 to 24 inches from the surface. Where a water main and recycled water main intersect, the plastic marking tape shall also be attached to the top of the pipe with nylon tie-wrap banded around the warning tape and the pipe every five feet on center. The warning tape shall extend to the nearest valves located on each side of said intersection.

J. Markers: Mains in unpaved areas shall be marked every 150 lineal feet with a blue composite utility marker having a decal stating: "Caution Water Pipeline." Appurtenances (valves, ARV's, test stations, etc.) and angle points shall also be marked. All fire hydrants shall be marked with blue, two-way, retro-reflective markers placed 6" off the street centerline on the side nearest the hydrant.

K. Water Sampling Stations: Water sampling stations shall be provided to the satisfaction of the County Engineer.

8-17 RECYCLED WATER AND NON-POTABLE WATER DISTRIBUTION MAINS

Recycled water and non-potable water facilities may be required for use in specified areas as determined by projects conditions of approval or County policy, in consultation with the County Engineer. Design flows and demands for recycled and non-potable water systems shall be determined by the developer's engineer. Design requirements for recycled water and non-potable water distribution mains are similar to potable water; however, there are special provisions described as follows:

1. To avoid cross connection of the potable and non-potable water systems, recycled water and non-potable facilities shall be clearly marked through appropriate coloring of pipe materials and above ground appurtenances. Coloring shall be purple unless otherwise directed.
2. Pipe color shall be purple and embossed or integrally stamped/marked "CAUTION: NONPOTABLE WATER - DO NOT DRINK", or "CAUTION: RECYCLED WATER - DO NOT DRINK". Valve and meter boxes shall be colored purple and have the words "NONPOTABLE WATER" stamped into the face.
3 All above ground facilities shall be marked with signage to caution against drinking water from the recycled water system. All signs shall be made and placed in such a manner as to become a permanent part of the facility or appurtenance. Park sites, large turf areas, and other publicly used areas may require warning signs of the appropriate size as determined by the County Engineer or other regulatory agency.
4. The recycled and non-potable water system shall maintain a minimum pressure of 40 psi.
5. The recycled and non-potable water mains shall be located on the south and east side of a street (or same side as the sanitary sewer). The recycled and non-potable water mains shall be located at a minimum of four feet from the lip of gutter. The recycled and non-potable water mains and valve actuators will be located in the center of traffic lanes or on traffic lane lines. A deviation from these criteria may be allowed if approved by the County Engineer in consultation with other affected utility providers.

8-18 TESTING PROCEDURES

Testing of the water system may proceed only after joint utility crossings are completed, the sewer mains and services have passed pressure test and TV inspection, the recycled water system has passed testing, and subgrade elevations have been met. Road bases to be lime-treated shall be pressure tested before and after the lime treatment process. Testing prior to subgrade placement may be subject to additional pressure tests at the discretion of the County Engineer. The new system shall be filled with potable water through an approved backflow device.

A. Pressure Test:

1. Contractor shall verify that all system valves are open prior to testing.
2. The County inspector shall be present during the duration of the test.
3. Pressure testing shall be conducted for two hours at 150 pounds per square inch or at one-and-one-half times the operating pressure, whichever is higher, as measured from the system high point. The test gauge shall be liquid-filled and capable of testing up to 300 psi.
4. No detectable leakage is allowed.

B. Chlorine Disinfection: Chlorine disinfection shall comply with the AWWA Standard for Disinfection Water Mains (C651-92) and as specified below:

1. Disinfection inspections shall begin only after passing the pressure test.
2. Prior to chlorination, pre-flush water mains and services. Preflushing is not permitted if using the Tablet Method for chlorination.

3. Chlorine shall be drawn through all mains, hydrant runs and services. The County inspector shall verify that a minimum chlorine residual of 50 parts per million (ppm) has been achieved.
4. After a 24-hour holding period, the County inspector will verify that a minimum chlorine content of 25 ppm remains in the system.
5. Upon approval by the County inspector, the water system shall be flushed to remove concentrated chlorine. Flushing shall be continued until the remaining water has a chlorine residual below 1 ppm and a turbidity equal to or less than 1 NTU. Chlorinated water shall be neutralized to 1 ppm chlorine residual or less prior to discharge. Discharge location and neutralization methods shall be documented in the SWPPP and coordinated with and approved by the County.

C. Water Quality Testing: Water quality samples shall be taken per the following procedure:

1. Once flushing has lowered the chlorine residual below 1 ppm and the turbidity is equal to or less than 1 NTU, the water system shall observe a minimum 24 hour detention time. Water may not be drawn during this time period.
2. After the 24-hour holding period has elapsed, water quality samples shall be collected by the County inspector for testing.
3. If the sample lot does not meet the minimum chlorine residual and turbidity criteria, additional flushing shall be required. The procedure shall be repeated until the criteria are met.
4. A minimum of 2 sets of samples at least 24 hours apart after completion of final flushing as indicated above shall be taken at locations indicated in ANSI/AWWA C651 and will be tested for coliform organisms and heterotrophic plate count. Costs for testing will be the Developer's responsibility. Satisfactory bacteriological results will be:
    a) absence of total and fecal coliform,
    b) a heterotrophic plate count less than 100 CFU and
    c) CL_2 Residual

D. Continuity Testing: The Contractor shall test continuity of the tracing wire with standard locating equipment. The County inspector shall witness all testing. Discontinuity in the tracing wire shall be repaired. It is recommended that the Contractor perform continuity testing after subgrade is made, but before asphalt is placed. Final continuity testing will take place after asphalt is placed and all valve boxes are raised.

E. Corrosion Protection System Testing: At the completion of the pipe installation, the corrosion engineer shall conduct a test of the corrosion monitoring system in the presence of the County inspector. A report showing the test results shall be submitted to the County for review and approval. The report shall include test station locations as called out on the approved plans, appurtenance tested, test result, and recommendations for future monitoring and maintenance.

8-19 RECORD PLANS

Record Drawings shall be prepared in accordance with Section 2-11 *Record Plans* of these improvement standards and shall also include the following:

1. Each sheet of the improvement plan shall be labeled or stamped "As-Built" or "Record Drawing".
2. Elevations of the top of the end of distribution mains.
3. The type of water distribution main pipe installed shall be clearly marked on each sheet.
4. The type of end fitting and pipe at the end of the distribution mains shall be described.

5. Changes of location of shut-off valves, fittings, air release/vacuum valves, blow-off assemblies, hydrants, and water services which vary from the improvement plans.

Record Drawings shall be approved by the County Engineer prior to acceptance of the project.

PART 4 – BID AND CONTRACT DOCUMENTS

COUNTY OF YOLO
DEPARTMENT OF COMMUNITY SERVICES
DIVISION OF INTEGRATED WASTE MANAGEMENT
44090 COUNTY ROAD 28H, WOODLAND, CALIFORNIA 95776
(530) 666-8852

BID DOCUMENTS, PROPOSAL, BOND FORMS, AND AGREEMENT

FOR THE

CONSTRUCTION OF THE EXTRACTION WELL PIPELINES

DECEMBER 7, 2021

IN THE
COUNTY OF YOLO

W.O. 9363

BID OPENING: JANUARY 18, 2022 @ 2PM
County of Yolo
Yolo County Central Landfill
Conference Room
44090 County Road 28H
Woodland, CA 95776

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BIDDER'S CHECKLIST

This checklist has been prepared and furnished to aid bidders in including all necessary supporting information with their proposal. Bidders shall also reference the Plans and Specifications in preparing their proposals, including the Notice to Contractors and Section 2 of the General Provisions, which provides the proposal requirements and conditions. Bidder's submittals should include, but are not limited to, the following:

ITEM	CHECKED
1. Proposal (Bid) w/ Addendum Acknowledgment	_____
2. Bid Schedule	_____
3. Bidder's Statement of Financial Responsibility, Technical Ability and Experience	_____
3a. Additional Satisfactory Evidence	_____
4. Debarment and Suspension	_____
5. List of Subcontractors	_____
6. Noncollusion Declaration	_____
7. Iran Contracting Act Certification	_____
8. Public Works Contractor Registration Certification	_____
9. Proposal Guarantee	_____

(DO NOT DETACH)

PROPOSAL

to the
DEPARTMENT OF COMMUNITY SERVICES
DIVISION OF INTEGRATED WASTE MANAGEMENT
COUNTY OF YOLO

WORK ORDER NO. 9363

NAME OF BIDDER

BUSINESS ADDRESS

CITY, STATE, ZIP

TELEPHONE NO: AREA CODE (____)

FAX NO.: AREA CODE (____)

In response to the Notice to Contractors and in accordance with the Project Plans and Specifications (including the payment of not less than the minimum wage rates set forth therein) and the Contract annexed hereto, the undersigned hereby proposes to the County to furnish all labor, technical and professional services, supervision, materials and equipment, other than materials and equipment specified as furnished by the County, and to perform all operations necessary and required to construct the project in accordance with the provisions of the Plans and Specifications and any addenda thereto, and at the prices stated opposite the respective items set forth in the Bid Schedule.

The Project Plans and Specifications for the work to be done are dated DECEMBER 7, 2021 and are entitled:

PLANS AND SPECIFICATIONS
FOR THE
CONSTRUCTION OF EXTRACTION WELL PIPELINES
at the
YOLO COUNTY CENTRAL LANDFILL

The undersigned certifies that it has examined and is fully familiar with all of the provisions of the Plans and Specifications and any addenda thereto; that it has carefully checked all of the words and figures shown in its Bid Schedule; that it has carefully reviewed the accuracy of all statements in this proposal and attachments hereto; and that it understands and agrees

that the County will not be responsible for any errors or omissions on the part of the undersigned in preparing this proposal.

The undersigned has by careful examination of the Plans and Specification and any addenda thereto, and by examination of the actual site conditions, satisfied itself as to the nature and location of all work, the general and local conditions to be encountered in the performance of any work, the requirements of the Contract and all other matters which can in any way affect the work or the cost thereof.

This proposal constitutes a firm offer to the County which cannot be withdrawn for 120 days after the date set for opening of proposals, or until a contract is executed by the County and a third party, whichever is earlier.

Enclosed find cash, bidder's bond, or cashier's or certified check No. _____ from the _____ Bank in the amount of _____, which is not less than ten percent (10%) of this bid, payable to the County of Yolo as bid security and which is given as a guarantee that the undersigned will enter into a contract and provide the necessary bonds and certificates of insurance if awarded the work.

If awarded a Contract, the undersigned agrees to execute and deliver to the County within ten (10) days after date of receipt of Notice of Award, a signed Contract and the necessary Performance Bond, Payment Bond, Certificates of Insurance and Endorsements, and Tax Identification Number.

The undersigned certifies that it is licensed in accordance with the California law providing for the registration of Contractors, License No. _____, Expiration Date _____, class of license(s) _____. If the bidder is a joint venture, each member of the joint venture must include the above information.

The following forms, which have been completed and executed by undersigned bidder, are incorporated by this reference and made a part of this proposal:

BID SCHEDULE
BIDDER'S STATEMENT OF FINANCIAL RESPONSIBILITY, TECHNICAL ABILITY, AND EXPERIENCE
DEBARMENT AND SUSPENSION
LIST OF SUBCONTRACTORS
NONCOLLUSION DECLARATION
IRAN CONTRACTING ACT CERTIFICATION
PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION
PROPOSAL GUARANTEE

The undersigned acknowledges receipt, understanding, and full consideration of the following addenda to the Plans and Specifications:

Addenda No. _____

(Fill in addenda numbers if addenda have been received and insert, in this Proposal, any Bid Schedule sheets that were received as part of the addenda.)

[SIGNATURE AND CERTIFICATION ON THE NEXT PAGE]

The undersigned acknowledges that the representations made herein are made under penalty of perjury under the laws of the State of California.

Bidder:

_____
(Company Name)

By _____
(Signature)

_____
(Type or print name)

_____
(Title)

_____
(Where signed) (City, State)

Bidder's Business Address:

_____
_____
_____
_____

(corporate seal)

Dated:_____, 20_____
State of Incorporation:_____

Names of individual members of firm or names and titles of all officers of corporation and their addresses are listed below:

Name_____ Title_____

Complete Address_____

Phone_____FAX_____

Name_____ Title_____

Complete Address_____

Phone_____ FAX_____

Name_____ Title_____

Complete Address_____

Phone_____ FAX_____

BID SCHEDULE

CONTRACT PRICE SCHEDULE

Item No	Description	Section Reference[1]	Estimate Quantity	Unit	Unit Price	Total Cost
1	Mobilization/Demobilization	11-6	1	LS		
2	Prepare and Implement Drainage and Erosion Control Plan	11-6	1	LS		
3	Well connections and wellhead piping modifications	11-6	11	EA		
4	6in HDPE Piping	Greenbook 306-15.1	7,712	LF		
5	6in resilient wedge gate valve, box and cover	Greenbook 306-15.1	4	EA		
Total Bid						

Notes:
(1) The Section Reference provides the Section number within the Technical Provisions or Contract Documents where the measurement and payment of the bid item is described.

The costs for any work shown or required in the Plans and Specifications, but not specifically identified as a line item are to be included in the related line items and no additional compensation shall be due to Contractor for the performance of the work.

The bidder shall set forth for each unit basis item of work an item price and a total for the item, and for each lump sum item a total for the item, all in clearly legible figures in the respective spaces provided for this purpose. In the case of unit basis items, the amount set forth under the "Total" column shall be the extension of the item price bid on the basis of the estimated quantity for the item.

In case of discrepancy between the item price and the total set forth for a unit basis item, the unit price shall prevail, except as provided in (a) or (b), as follows:

(a) If the amount set forth as a unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item total column, then the amount set forth in the item total column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price;

(b) (Decimal Errors) If the product of the entered unit price and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc. from the entered total, the discrepancy will be resolved by using the entered unit price or item price or item total, whichever most closely approximates percentage-wise the unit price or item total in the County's final estimate of cost.

For purposes of evaluating bids, the County will correct any apparent errors in the extension of unit prices and any apparent errors in the addition of lump sum and extended prices.

The estimated quantities for unit price items are for purposes of comparing bids only and the County makes no representation that the actual quantities of work performed will not vary from the estimates. Final payment shall be determined by the Engineer from measured quantities of work performed based upon the unit price.

BIDDER'S STATEMENT OF FINANCIAL RESPONSIBILITY, TECHNICAL ABILITY, AND EXPERIENCE

The Bidder is required to state its financial responsibility, technical ability and what work of a similar character to that included in the proposed Contract he or she has successfully performed and give reference which will enable the Board of Supervisors to judge his or her responsibility, experience, skill, and business standing.

Bidder shall also provide Additional Satisfactory Evidence, on its own form, as defined in Section 11-4 of the Special Provisions.

For bids in excess of seven hundred fifty thousand ($750,000), the bidder must submit proof of participation in a State of California Division of Apprenticeship Standards approved joint labor and management apprenticeship program.

A. INFORMATION ABOUT BIDDER

(Indicate not applicable ("N/A") where appropriate.)

NOTE: Where bidder is a joint venture, pages shall be duplicated and information provided for all parties to the joint venture.

1.0 Name of Bidder: _____

2.0 Type, if Entity: _____

3.0 Bidder Address: _____

_____

_____

Facsimile Number Telephone Number

_____

Email Address

4.0 How many years has Bidder's organization been in business as a Contractor?

_____

5.0 How many years has Bidder's organization been in business under its present name? _____

5.1 Under what other or former names has Bidder's organization operated?_____

6.0 If Bidder's organization is a corporation, answer the following:

6.1 Date of Incorporation: _____

6.2 State of Incorporation: _____

6.3 President's Name: _____

6.4 Vice-President's Name(s): _____

_____

6.5 Secretary's Name: _____

6.6 Treasurer's Name: _____

7.0 If an individual or a partnership, answer the following:

7.1 Date of Organization: _____

7.2 Name and address of all partners (state whether general or limited partnership):

_____

_____

_____

8.0 If other than a corporation or partnership, describe organization and name principals:

_____

_____

9.0 List other states in which Bidder's organization is legally qualified to do business.

_____

_____

_____

10.0 What type of work does the Bidder normally perform with its own forces?

_____

_____

11.0 Has Bidder ever failed to complete any work awarded to it? If so, note when, where, and why:

_____

_____

12.0 Within the last five years, has any officer or partner of Bidder's organization ever been an officer or partner of another organization when it failed to complete a contract? If so, attach a separate sheet of explanation:

_____

_____

13.0 List Trade References:

_____

_____

_____

_____

14.0 List Bank References (Bank and Branch Address):

_____

_____

_____

_____

15.0 Name of Bonding Company and Name and Address of Agent:

_____

_____

_____

B. LIST OF CURRENT PROJECTS (BACKLOG)

[**Duplicate Page if needed for listing additional current projects.**]

Project	Description of Bidder's Work	Completion Date	Cost of Bidder's Work

C. LIST OF COMPLETED PROJECTS – LAST FIVE YEARS

[**Duplicate Page if needed for listing additional completed projects.**]

Please include only those projects which are similar enough to demonstrate bidder's ability to perform the required work.

Project	Description of Bidder's Work	Completion Date	Cost of Bidder's Work

D. EXPERIENCE AND TECHNICAL QUALIFICATIONS QUESTIONNAIRE

The bidder shall identify the key personnel to be assigned to this project in a management, construction supervision or engineering capacity. The bidder may provide a current resume for each key personnel that is fully responsive to each question below.

1. List each person's job title, name and percent of time to be allocated to this project:

_____

_____

_____

2. Summarize each person's specialized education:

_____

_____

_____

3. List each person's years of construction experience relevant to the project:

_____

_____

_____

4. Summarize such experience:

_____

_____

_____

Bidder agrees that personnel named in this bid will remain on this project until completion of all relevant work, unless substituted by personnel of equivalent experience and qualifications approved in advance by the County.

E. ADDITIONAL BIDDER'S STATEMENTS:

If the bidder feels that there is additional information which has not been included in the questionnaire above, and which would contribute to the qualification review, it may add that information in a statement here or on an attached sheet, appropriately marked:

_____
_____
_____
_____
_____
_____

Name of Bidder_____

Signature_____

Name and Title_____

Dated_____

DEBARMENT AND SUSPENSION

(Public Contract Code Section 6109)

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

Signature:_____

Printed Name:_____

Title:_____

Firm Name:_____

Date:_____

LIST OF SUBCONTRACTORS

The subcontractor listed below will perform work or labor or render service to the contractor in or about the construction of the work or improvement, or are subcontractors licensed by the State of California who will, under subcontract to the contractor, specially fabricate and install a portion of the work or improvement according to detailed drawings contained in the Contract Documents, in an amount in excess of one-half of one percent (1/2 of 1%) of the contractor's total bid. Notwithstanding the foregoing, if the work involves the construction of streets and highways, then the bidder shall list each subcontractor who will perform work or labor or render service to the bidder in or about the work in an amount in excess of one-half of one percent (0.5%) of the bidder's total bid price or $10,000, whichever is greater. No additional time shall be granted to provide the below requested information.

In compliance with the Subletting and Subcontracting Fair Practices Act Chapter 4 (commencing at Section 4100), Part 1, Division 2 of the California Public Contract Code, the bidder shall set forth below:

a) The name and the location of the place of business;

b) The California contractor license number;

c) The DIR public works contractor registration number; and

d) The portion of the work which will be done by each subcontractor.

If a bidder fails to specify a subcontractor or if a contractor specifies more than one subcontractor for the same portion of work, then the bidder shall be deemed to have agreed that it is fully qualified to perform that portion of work and that it shall perform that portion itself.

Work to be done by Subcontractor	**Name of Subcontractor**	**Location of Business**	**CSLB Contractor License No.**	**DIR Registration Number**

Work to be done by Subcontractor	Name of Subcontractor	Location of Business	CSLB Contractor License No.	DIR Registration Number

Work to be done by Subcontractor	Name of Subcontractor	Location of Business	CSLB Contractor License No.	DIR Registration Number

(Attach additional sheets if necessary)

Name of Bidder_____

Signature_____

Name and Title_____

Dated_____

NONCOLLUSION DECLARATION TO BE EXECUTED
BY BIDDER AND SUBMITTED WITH BID
(Public Contract Code Section 7106)

State of California)
) ss.
County of Yolo)

The undersigned declares:

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

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

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

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

Name of Bidder_____

Signature_____

Name and Title_____

Dated_____

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

IRAN CONTRACTING ACT

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

☐ The Contractor is not:

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

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

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

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

Signature:_____

Printed Name:_____

Title:_____

Firm Name:_____

Date:_____

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

PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See http://www.dir.ca.gov/Public-Works/PublicWorks.html for additional information.

No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

Bidder hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and is currently registered as a contractor with the Department of Industrial Relations. If the project is exempt from the contractor registration requirements pursuant to the small project exemption under Labor Code Sections 1725.5 and 1771.1, please mark "Yes" in response to "Small Project Exemption."

Name of Bidder:_____

DIR Registration Number: _____

DIR Registration Expiration:_____

Small Project Exemption: _____ Yes or _____ No

Unless Bidder is exempt pursuant to the small project exemption, Bidder further acknowledges:

1. Bidder shall maintain a current DIR registration for the duration of the project.

2. Bidder shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.

3. Failure to submit this form or comply with any of the above requirements may result in a finding that the bid is non-responsive.

Name of Bidder_____

Signature_____

Name and Title_____

Dated_____

PROPOSAL GUARANTEE

[Note: Not required when other form of bidder's security, e.g. cash, certified check or cashier's check, accompanies bid.]

The makers of this bond are, _____, as Principal, and _____, as Surety and are held and firmly bound unto the County of Yolo, organized and operating under the laws of the State of California, hereinafter called the County, in the penal sum of TEN PERCENT (10%) OF THE TOTAL BID PRICE of the Principal submitted to the County for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted the accompanying bid dated _____, 20 ____, for THE CONSTRUCTION OF EXTRACTION WELL PIPELINES.

If the Principal does not withdraw its bid within the time specified in the Contract Documents; and if the Principal is awarded the Contract and provides all documents to the County as required by the Contract Documents; then this obligation shall be null and void. Otherwise, this bond will remain in full force and effect.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents shall affect its obligation under this bond, and Surety does hereby waive notice of any such changes.

In the event a lawsuit is brought upon this bond by the County and judgment is recovered, the Surety shall pay all litigation expenses incurred by the County in such suit, including reasonable attorneys' fees, court costs, expert witness fees and expenses.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this _____ day of _____, 20____, the name and corporate seal of each corporation.

(Corporate Seal)

_____
Contractor/ Principal

By_____

Title_____

_____
Surety

(Corporate Seal)

By _____
Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title_____

Notary 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 _____

On ____, 20___, before me, _____, Notary Public, personally

appeared _____, who proved to me on the basis of satisfactory
Name(s) of Signer(s)

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 of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

- ☐ Individual
- ☐ Corporate Officer

_____
Title(s)

- ☐ Partner(s) ☐ Limited ☐ General
- ☐ Attorney-In-Fact
- ☐ Trustee(s)
- ☐ Guardian/Conservator
- ☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____

_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

Notary 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 _____

On ____, 20___, before me, _____, Notary Public, personally

appeared _____, who proved to me on the basis of satisfactory
Name(s) of Signer(s)

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 of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

- ☐ Individual
- ☐ Corporate Officer

_____
Title(s)

- ☐ Partner(s) ☐ Limited ☐ General
- ☐ Attorney-In-Fact
- ☐ Trustee(s)
- ☐ Guardian/Conservator
- ☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____

_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

COUNTY OF YOLO, CALIFORNIA
AGREEMENT NO. _____

County Work Order No. 9363

THIS AGREEMENT, ("Agreement" or "Contract")) made and entered into on this ____ day of MONTH, between the COUNTY OF YOLO, a political subdivision of the State of California ("COUNTY"), and_____, ("CONTRACTOR"), a California corporation.

ARTICLE I. In consideration of the payments and agreements hereinafter mentioned, to be made and performed by the COUNTY, CONTRACTOR shall, at his or her own cost and expense, furnish all the labor, technical and professional services, supervision, materials, and equipment, except such as are mentioned in the Contract Documents referenced below to be furnished by the COUNTY, and perform all operations necessary to construct and complete in a good, workmanlike and substantial manner and to the satisfaction of the COUNTY, the work described in the Contract Documents for the public work of improvement titled:

PLANS AND SPECIFICATIONS FOR THE
CONSTRUCTION OF THE EXTRACTION WELL PIPELINES
at the
YOLO COUNTY CENTRAL LANDFILL
Dated DATE

ARTICLE II. Time is of the essence in the performance of the work. The work shall be commenced and completed pursuant to Section 11-5 of the Special Provisions.

ARTICLE III. The COUNTY shall pay to the CONTRACTOR as full compensation for the performance of the Contract, subject to any additions or deductions as provided in the Contract Documents, and including all applicable taxes and costs, the sum of _____ Dollars ($_____), hereinafter, the Contract Price. Payment shall be made as set forth in the General Provisions. COUNTY will pay to CONTRACTOR compensation based upon the prices set forth in the Contract Price Schedule.

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

ARTICLE V. CONTRACTOR shall provide indemnification and defense as set forth in the General Provisions.

ARTICLE VI. The "Contract Documents" include the following documents, each of which is incorporated into this Contract by reference:

Notice to Contractors
Addenda
Proposal, including all required forms
Performance Bond
Payment Bond
General Provisions
Special Provisions
Technical Provisions
Standard Drawings
Project Drawings
Standard Construction Specifications
Change Orders executed by the COUNTY

The CONTRACTOR shall complete the Work in strict accordance with all of the Contract Documents.

All of the Contract Documents are intended to be complementary. Work required by one of the Contract Documents and not by others shall be done as if required by all. In the event of a conflict, the various Contract Documents will be given effect in the order set forth in the General Provisions.

ARTICLE VII. Each and every provision of law required to be included in these Contract Documents shall be deemed to be included in these Contract Documents. The CONTRACTOR shall comply with all requirements of applicable federal, state and local laws, rules and regulations, including, but not limited to, the provisions of the California Labor Code and California Public Contract Code which are applicable to this work.

CONTRACT PRICE SCHEDULE

Item No.	Description	Section Reference[1]	Estimate Quantity	Unit	Unit Price	Total Cost
1	Mobilization/Demobilization		1	LS		
2	Storm Water Pollution Prevention		1	LS		
3	Well connections and wellhead piping modifications		11	EA		
4	6in HDPE Piping	Greenbook 306-15.1	7,712	LF		
5	6in resilient wedge gate valve, box and cover	Greenbook 306-15.1	4	EA		
					Total	

ARTICLE VIII. CONTRACTOR expressly acknowledges that CONTRACTOR is fully cognizant of, fully understands, and unreservedly agrees that, all provisions of the Project Plans and Specifications are absolutely controlling and equally applicable.

ARTICLE IX. CONTRACTOR shall maintain, at its sole cost an expense, the insurance requirements attached hereto as Exhibit A and incorporated herein by this reference throughout the entire term of this Agreement.

ARTICLE X.

A) It is understood and agreed by all the parties hereto that CONTRACTOR is an independent CONTRACTOR and that no relationship of employer-employee exists between the COUNTY and CONTRACTOR. Neither CONTRACTOR nor CONTRACTOR's assigned personnel shall be entitled to any benefits payable to employees of the COUNTY. CONTRACTOR hereby indemnifies and holds the COUNTY harmless from any and all claims that may be made against the COUNTY based upon any contention that an employer-employee relationship exists by reason of this Agreement.

B) It is further understood and agreed by all parties hereto that neither CONTRACTOR nor CONTRACTOR's assigned personnel shall have any right to act on behalf of the COUNTY in any capacity whatsoever as an agent or to bind the COUNTY to any obligation whatsoever.

C) It is further understood and agreed by all parties hereto that CONTRACTOR must issue any and all forms required by Federal and State laws for income and employment tax purposes, including W-2 and 941 forms, for all of CONTRACTOR's assigned personnel.

ARTICLE XI. In the performance of the services required by this Agreement, CONTRATOR shall comply with all applicable Federal, State, and County statutes, ordinances, regulations, directives, and laws. This Agreement shall be deemed to be executed within the State of California and construed in accordance with and governed by the laws of the State of California. Any action or proceeding arising out of this Agreement shall be filed in a California Superior Court located in Woodland, California.

ARTICLE XII. The waiver by COUNTY or any of its officers, agents, or employees or the failure of the COUNTY or its officers, agents, or employees to take action with respect to any right conferred by, or any breach of any obligation or responsibility of this Agreement shall not be deemed to be a waiver of such obligation or responsibility, or subsequent breach of same, or of any terms, covenants, or conditions of this Agreement.

ARTICLE XIII. This Agreement, including all exhibits expressly incorporated therein, constitutes the entire agreement between the COUNTY and CONTRACTOR and supersedes all prior negotiations, representations, or agreements, whether written or oral. In the event of a dispute between the parties as to the language of this Agreement or the construction or meaning of any term hereof, this Agreement shall be deemed to have been drafted by the parties in equal parts so that no presumptions or inferences concerning its terms or interpretation may be construed against any party to this Agreement.

ARTICLE XIV. This Agreement may be amended only by written instrument signed by the COUNTY and CONTRACTOR.

ARTICLE XV. Contractor certifies that any service provided pursuant to this Agreement shall be without discrimination based on color, race, creed, national origin, religion, sex, age, sexual preferences, or physical or mental disability in accordance with all applicable Federal, State and County laws and regulations and any administrative directives established by the County Board of Supervisors or the County Administrative Officer. For the purpose of this Agreement, distinctions on the grounds of color, race, creed, national origin, religion, sex, age, sexual preferences, or physical or mental disability include but are not limited to the following: denying a participant any service or benefit which is different, or is provided in a different manner or at a different time from that provided to other participants under this Agreement; subjecting a participant to segregation or separate treatment in any way in the enjoyment or any advantage or privilege enjoyed by others receiving any service or benefit; treating a participant differently from others in determining whether the participant has satisfied any admission, enrollment quota, eligibility, membership, or other requirement or condition which individuals must meet in order to be provided any service or benefit; and the assignment of times or places for the provision of services.

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

ARTICLE XVII. All notices shall be in writing and either served by personal delivery or mailed to the other party as designated in the Contract Documents. Written notice to the CONTRACTOR shall be addressed to CONTRACTOR's principal place of business unless CONTRACTOR designates another address in writing for service of notice. Notice to the COUNTY shall be addressed to the COUNTY as designated in the Notice to Contractors unless COUNTY designates another address in writing for service of notice. Notice shall be effective upon receipt or five (5) calendar days after being sent by first class mail, whichever is earlier. Notice given by facsimile shall not be effective unless acknowledged in writing by the receiving party.

ARTICLE XVIII. Should a change be contemplated in the name or nature of the CONTRACTOR's legal entity, the CONTRACTOR shall first notify the COUNTY in order that proper steps may be taken to have the change reflected on the Contract and all related documents. No change of CONTRACTOR's name or nature will affect the COUNTY's rights under the Contract, including but not limited to the bonds.

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

COUNTY:	**CONTRACTOR:**
COUNTY OF YOLO	CONTRACTOR
By: _____ Ramin Yazdani, Director, Integrate Waste Management Yolo County Department of Community Services	By:_____ Name: _____ Title: _____

Licensed in accordance with an act providing for the registration of CA State Contractors, License No._____

CA Department of Industrial Relations Public Works Contractor Identification Number _____

Approved as to Form:
Philip Pogledich, County Counsel

By: _____
Eric May, Senior Deputy

EXHIBIT A

INSURANCE REQUIREMENTS

A. During the term of this Agreement, Contractor shall at all times maintain, at its expense, the following coverages and requirements. The comprehensive general liability insurance shall include broad form property damage insurance.

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

    a. **Comprehensive General Liability** – $1,000,000/occurrence and $2,000,000/aggregate
    b. **Automobile Liability** – $1,000,000/occurrence (general) and $500,000/occurrence (property) [include coverage for Hired and Non-owned vehicles.]
    c. **Professional Liability/Malpractice/Errors and Omissions** – $1,000,000/occurrence and $2,000,000/aggregate (If any engineer, architect, attorney, accountant, medical professional, psychologist, or other licensed professional performs work under a contract, the contractor must provide this insurance. If not, then this requirement automatically does not apply.)
    d. **Workers' Compensation** – Statutory Limits/**Employers' Liability** - $1,000,000/accident for bodily injury or disease (If no employees, this requirement automatically does not apply.)

2. 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.

    a. 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.

b. 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.

B. 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.

C. 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.

D. 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.

E. 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.

PAYMENT BOND

BOND NO. _____

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the County of Yolo, State of California, ("Owner") has awarded to _____ ("Contractor/Principal") a contract (County Agreement No._____, dated _____, 2022, referred to as the "Agreement") for the work described as _____. The Agreement is incorporated by this reference into this Payment Bond ("Bond"); and

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

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

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

It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, or specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described; or pertaining or relating to the furnishing of labor, materials, or equipment therefor; nor by any change or modification of any terms of payment or extension of time for payment pertaining or relating to any scheme or work of improvement herein above described; nor by any rescission or attempted rescission of the contract, agreement or bond; nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond; nor by any fraud practiced by any person other than the claimant seeking to recover

on the bond; and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given; and under no circumstances shall the Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Owner and Contractor/Principal or on the part of any obligee named in such bond; that the sole condition of recovery shall be that the claimant is a person described in California Civil Code section 9100, and who has not been paid the full amount of his or her claim; and that the Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned, including but not limited to the provisions of sections 2819 and 2845 of the California Civil Code.

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

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

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

_____ (SEAL)
Contractor/Principal

By:_____
Contractor/'s Representative

_____
Contractor/Principal's Address

_____
City, State, Zip

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

_____
Surety's Address

_____
City, State, Zip

_____
Telephone Number

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

Notary 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 _____

On ____, 20___, before me, _____, Notary Public, personally

appeared _____, 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 of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General
☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

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_____
Title(s)

- ☐ Partner(s) ☐ Limited ☐ General
- ☐ Attorney-In-Fact
- ☐ Trustee(s)
- ☐ Guardian/Conservator
- ☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

PERFORMANCE BOND

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 Contract for the Project dated _____, (hereinafter referred to as "Contract Documents"), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by 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) _____

Notary 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 _____

On ____, 20___, before me, _____, Notary Public, personally

appeared _____, 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 of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

- ☐ Individual
- ☐ Corporate Officer

_____
Title(s)

- ☐ Partner(s) ☐ Limited ☐ General
- ☐ Attorney-In-Fact
- ☐ Trustee(s)
- ☐ Guardian/Conservator
- ☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

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Signer is representing:
Name Of Person(s) Or Entity(ies)

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Title or Type of Document

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Number of Pages

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Date of Document

_____
Signer(s) Other Than Named Above

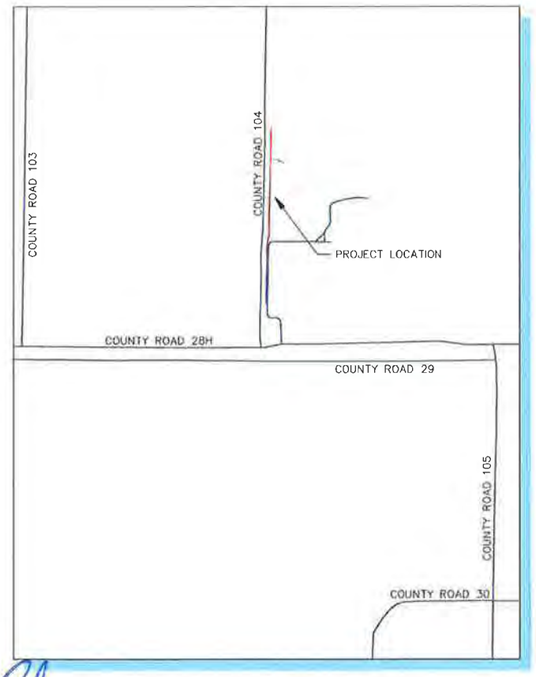
PART 5 – CONSTRUCTION PLANS

YOLO COUNTY LANDFILL EXTRACTION WELL PIPELINES

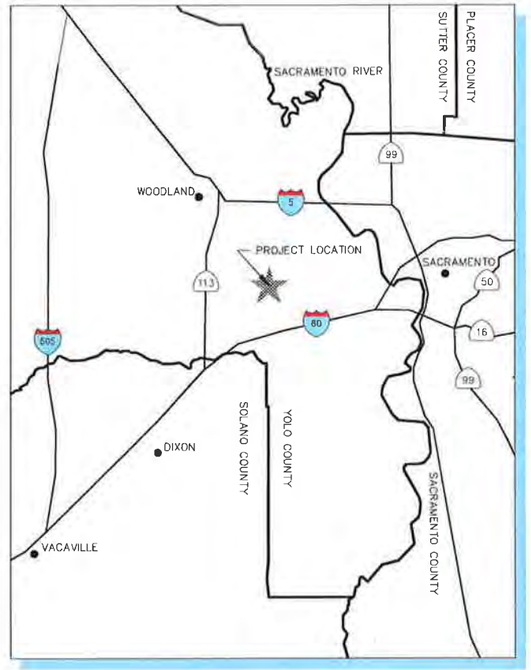
PREPARED FOR:

COUNTY OF YOLO

CALIFORNIA COUNTIES



VICINITY MAP

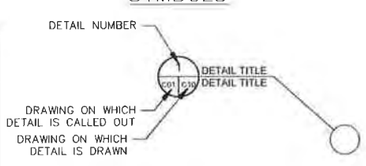


REGIONAL MAP

ABBREVIATIONS

ø	DIAMETER	N	NORTHING
AB	AGGREGATE BASE	TYP	TYPICAL
E	EASTING		
FT	FEET		
GCL	GEOSYNTHETIC CLAY LINER		
HDPE	HIGH DENSITY POLYETHYLENE		
MIN	MINIMUM		

SYMBOLS



DRAWING INDEX

DRAWING NUMBER	TITLE AND DESCRIPTION	LATEST REVISION NUMBER	LATEST REVISION DATE
GENERAL			
G01	TITLE PAGE		
G02	GENERAL NOTES AND LEGEND		
CIVIL			
C01	OVERALL SITE PLAN AND SURVEY CONTROL		
C02	CIVIL DETAILS		

NOTE:
EXISTING TOPOGRAPHY BASED ON AERIAL SURVEY PERFORMED BY R.E.Y. ENGINEERS, INC. ON XXXX X, XXXX

BASIS OF COORDINATES

THE BEARINGS SHOWN HEREON ARE IN TERMS OF THE NORTH AMERICAN DATUM OF 1983 (NAD 83), EPOCH 1999.50 PER YOLO COUNTY SUBSIDENCE NETWORK. BASED LOCALLY UPON GPS OBSERVATIONS TO STATIONS "COY-1" AND "UCD1". THE COORDINATES WERE SCALED BY AN AVERAGE COMBINATION FACTOR OF 1.00004588 TO OBTAIN GROUND COORDINATES AND DISTANCES. COORDINATES ARE EXPRESSED IN U.S. SURVEY FEET

BASIS OF COORDINATES

THE COORDINATES UPON WHICH THIS SURVEY IS BASED UPON ARE IN TERMS OF THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011, EPOCH 2010.0, STATE PLANE COORDINATES ZONE 2.

BASIS OF ELEVATION

THE ELEVATIONS SHOWN HEREON ARE IN TERMS OF THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED LOCALLY UPON STATION "COY-1", ELEVATION=28.05'.

NOTES:
1. PIPE BENDS AND GEOSYNTHETICS ARE SHOWN NTS.

REV. NO.	DATE	DESCRIPTION	DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY

DATE OF ISSUE: 09/27/21
DESIGNED BY: JH
DRAWN BY: RT
CHECKED BY: MC
APPROVED BY: MC

Geo-Logic ASSOCIATES
143E Spring Hill Dr, Grass Valley, California 95945
geo-logic.com | 530.272.2448

COUNTY OF YOLO
DEPARTMENT OF COMMUNITY SERVICES
DIVISION OF INTEGRATED WASTE MANAGEMENT
44090 COUNTY ROAD 28H WOODLAND, CA 95776-9101

DIRECTOR
APPROVED _____ 20____
R. E. NO. _____

YOLO COUNTY
LANDFILL EXTRACTION WELL PIPELINES
YOLO COUNTY, CALIFORNIA
TITLE PAGE

DRAWING NO. G01
PROJECT NO. AU17.1142

This drawing has not been published but rather has been prepared by Geo-Logic Associates, Inc. for use by the client named in the title block, solely in respect of the construction operation, and maintenance of the facility named in the title block. Geo-Logic Associates, Inc. shall not be liable for the use of this drawing on any other facility or for any other purpose.

LOCATION: S:\Projects\AU17.1142 Yolo Landfill Pipeline Design\CAD\PRODUCTION\ G-0 TITLE PAGE.dwg DATE: 10/14/2021 4:45 PM PLOT SCALE = 1.0000' PLOTTED BY: THOMAS RYAN

GENERAL CONSTRUCTION NOTES:

A. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, ORDINANCES, AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.

B. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED CONSTRUCTION PERMITS AND APPROVALS OF LIKE KIND PRIOR TO START OF CONSTRUCTION.

C. PROJECT DOCUMENTS CONSIST OF THESE DRAWINGS, PROJECT SPECIFICATIONS, PROJECT CONTRACTS, AND ANY AND ALL SUBSEQUENT EXECUTED PROJECT DOCUMENTATION ISSUED AS, OR WITH, CHANGE ORDERS, AND RFI'S (REQUEST FOR INFORMATION.) THE CONTRACTOR SHALL REVIEW ALL PROJECT DOCUMENTS AND VERIFY ALL DIMENSIONS, QUANTITIES, AND FIELD CONDITIONS. ANY CONFLICTS OR OMISSIONS WITH THE DOCUMENTS SHALL BE REPORTED TO THE ENGINEER/PROJECT MANAGER FOR CLARIFICATION PRIOR TO PERFORMANCE OF ANY WORK IN QUESTION. IN THE EVENT THE CONTRACTOR DOES NOT NOTIFY THE ENGINEER/PROJECT MANAGER, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY AND ANY AND ALL EXPENSE FOR ANY REVISIONS NECESSARY OR CORRECTIONAL WORK REQUIRED.

D. THE LOCATION OF BURIED UTILITIES ARE BASED UPON INFORMATION PROVIDED TO THE ENGINEER BY OTHERS AND MAY NOT REFLECT ACTUAL FIELD CONDITIONS. EXISTING BURIED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL USE ANY MEANS APPROVED BY THE ENGINEER/PROJECT MANAGER TO LOCATE UNDERGROUND UTILITIES INCLUDING, BUT NOT LIMITED TO, ELECTRONIC LOCATING EQUIPMENT AND/OR POT HOLING. ANY DAMAGE TO ANY OTHER UTILITIES AND/OR COLLATERAL DAMAGE CAUSED BY THE CONTRACTOR SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.

E. EXISTING FENCING THAT IS NOT DESIGNATED FOR REMOVAL SHALL NOT BE DISTURBED. ANY FENCING THAT IS DISTURBED OR ALTERED BY THE CONTRACTOR SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. IF THE CONTRACTOR DESIRES TO REMOVE FENCING TO ACCOMMODATE CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL OBTAIN THE OWNER'S WRITTEN PERMISSION BEFORE FENCE IS REMOVED. CONTRACTOR SHALL RESTORE THE FENCE TO ITS ORIGINAL CONDITION AT THE EARLIEST OPPORTUNITY TO THE SATISFACTION OF THE OWNER. WHILE ANY FENCING IS REMOVED, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SECURITY OF THE SITE UNTIL THE FENCE IS RESTORED.

F. AT THE END OF EACH WORK DAY, THE CONTRACTOR SHALL CLEAN AND PICK UP THE WORK AREA TO THE SATISFACTION OF THE ENGINEER/PROJECT MANAGER. AT NO TIME SHALL THE WORK BE LEFT IN A MANNER THAT COULD ENDANGER THE WORKERS OR THE PUBLIC.

G. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO PROJECT SPECIFICATIONS AND PLANS, AS AMENDED AND REVISED BY THE ENGINEER. ALL INSTALLATION DETAILS ARE TYPICAL AND MAY BE CHANGED TO BETTER FIT EXISTING LOCAL CONDITIONS UPON APPROVAL BY THE ENGINEER.

H. ONLY THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFETY OF ALL WORK. ALL WORK, INCLUDING WORK WITHIN TRENCHES, SHALL BE IN ACCORDANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).

I. THE CONTRACTOR SHALL NOT INSTALL ITEMS AS SHOWN ON THESE PLANS WHEN IT IS OBVIOUS THAT FIELD CONDITIONS ARE DIFFERENT THAN SHOWN IN THE PLANS. SUCH CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN A TIMELY MANNER. IN THE EVENT THE CONTRACTOR DOES NOT NOTIFY THE ENGINEER IN A TIMELY MANNER, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY AND EXPENSE FOR ANY REVISIONS NECESSARY, INCLUDING ENGINEERING DESIGN FEES.

J. EXISTING SITE IMPROVEMENTS WHICH ARE DAMAGED OR DISPLACED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE. REPAIRS SHALL BE APPROVED BY THE OWNER PRIOR TO CONSTRUCTION OF THE REPAIRS. REPAIRS SHALL BE ACCEPTED BY THE OWNER PRIOR TO FINAL PAYMENT.

SURVEY MONUMENTS, PROPERTY CORNERS, BENCHMARKS

K. THE CONTRACTOR SHALL NOTIFY THE OWNER AT LEAST SEVEN (7) DAYS BEFORE BEGINNING ANY CONSTRUCTION ACTIVITY THAT COULD DAMAGE OR DISPLACE SURVEY MONUMENTS, PROPERTY CORNERS, OR PROJECT BENCHMARKS SO THESE ITEMS MAY BE RELOCATED.

L. ANY SURVEY MONUMENTS, PROPERTY CORNERS, OR BENCHMARKS THAT ARE NOT IDENTIFIED FOR RELOCATION ARE THE RESPONSIBILITY OF THE CONTRACTOR TO PRESERVE AND PROTECT. RELOCATION OR REPLACEMENT OF THESE ITEMS SHALL BE DONE BY THE OWNER'S SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.

DESIGN SURVEY

M. EXISTING TOPOGRAPHY BASED ON AERIAL SURVEY PERFORMED BY R.E.Y. ENGINEERS, INC. ON JULY 1, 2021. THE ENGINEER CANNOT VALIDATE OR WARRANTY THIS INFORMATION. ANY DISCREPANCIES BETWEEN THE DESIGN AND SITE SURFACE CONDITIONS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY.

PAVEMENT

N. WHEN ABUTTING NEW PAVEMENT TO EXISTING PAVEMENT, CUT EXISTING PAVEMENT EDGE TO A NEAT, STRAIGHT LINE AS NECESSARY TO REMOVE ANY BROKEN OR CRACKED PAVEMENT AND MATCH NEW PAVEMENT ELEVATION TO EXISTING.

O. ALL UTILITIES AND UTILITY SERVICE LINES SHALL BE INSTALLED AND APPROVED PRIOR TO PAVING.

UTILITIES

P. UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES SHOWN ON THESE DRAWINGS ARE SHOWN IN AN APPROXIMATE LOCATION ONLY BASED ON THE INFORMATION PROVIDED TO THE ENGINEER BY OTHERS. THIS INFORMATION MAY BE INACCURATE OR INCOMPLETE. ADDITIONALLY, UNDERGROUND LINES MAY EXIST THAT ARE NOT SHOWN. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ANY UTILITY LINE, PIPELINE, OR UNDERGROUND UTILITY LINE IN OR NEAR THE AREA OF THE WORK IN.

Q. THE CONTRACTOR SHALL CONTACT THE STATEWIDE UTILITY LOCATOR SERVICE AT 811 AT LEAST FIVE WORKING DAYS BEFORE BEGINNING CONSTRUCTION. AFTER THE UTILITIES ARE SPOTTED, THE CONTRACTOR SHALL EXPOSE ALL PERTINENT UTILITIES TO VERIFY THEIR VERTICAL AND HORIZONTAL LOCATION. IF A CONFLICT EXISTS BETWEEN EXISTING UTILITIES AND PROPOSED CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH MINIMAL DELAY.

R. THE CONTRACTOR SHALL EXERCISE DUE CARE TO AVOID DISTURBING ANY EXISTING UTILITIES, ABOVE OR BELOW GROUND. UTILITIES THAT ARE DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

S. THE CONTRACTOR SHALL COORDINATE ANY REQUIRED UTILITY INTERRUPTIONS WITH THE OWNER AND AFFECTED UTILITY COMPANY A MINIMUM OF FIVE (5) WORKING DAYS BEFORE THE INTERRUPTION.

T. THE CONTRACTOR SHALL MAINTAIN A RECORD DRAWING SET OF PLANS AND PROMPTLY LOCATE ALL UTILITIES, EXISTING OR NEW, IN THEIR CORRECT LOCATION, HORIZONTAL AND VERTICAL. THIS RECORD SET OF DRAWINGS SHALL BE MAINTAINED ON THE PROJECT SITE AND SHALL BE AVAILABLE TO THE OWNER AND ENGINEER AT ANY TIME DURING CONSTRUCTION. RECORD INFORMATION SHALL INCLUDE HORIZONTAL AND VERTICAL COORDINATE CALLOUTS, LINE SIZES, LINE TYPES, BURIAL DEPTHS, AND ALL OTHER PERTINENT INSTALLATION INFORMATION. IN ADDITION ALL ITEMS THAT ARE INSTALLED EXACTLY DESIGNED SHALL BE NOTED AS SUCH.

EROSION CONTROL, ENVIRONMENTAL PROTECTION, AND STORM WATER POLLUTION PREVENTION PLAN

U. THE CONTRACTOR SHALL CONFORM TO ALL LOCAL, AND FEDERAL DUST AND EROSION CONTROL REGULATIONS. THE CONTRACTOR SHALL PREPARE AND OBTAIN ANY DUST CONTROL OR EROSION CONTROL PERMITS FROM THE APPROPRIATE REGULATORY AGENCIES.

V. THE CONTRACTOR SHALL PROMPTLY REMOVE OR STABILIZE ANY MATERIAL EXCAVATED WITHIN THE RIGHT-OF-WAY OR ADJACENT PROPERTY TO KEEP IT FROM WASHING OFF THE PROJECT SITE.

W. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE ONTO ADJACENT PROPERTY BY CONSTRUCTION OF TEMPORARY EROSION CONTROL BERMS OR INSTALLING SILT FENCES AT THE PROPERTY LINES (OR LIMITS OF CONSTRUCTION WHERE DESIGNATED) AND WETTING SOIL TO PREVENT IT FROM BLOWING.

X. WATERING, AS REQUIRED FOR CONSTRUCTION DUST CONTROL, SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION AND NO MEASUREMENT OR PAYMENT SHALL BE MADE. CONSTRUCTION AREAS SHALL BE WATERED FOR DUST CONTROL, THE OWNER WILL PROVIDE WATER FREE OF CHARGE TO THE CONTRACTOR FOR CONSTRUCTION IN COMPLIANCE WITH STATE ORDINANCES.

Y. THE CONTRACTOR SHALL PROPERLY HANDLE AND DISPOSE OF ALL ASPHALT AND CONCRETE REMOVED ON-SITE AT A LOCATION IDENTIFIED BY THE OWNER.

Z. ALL WASTE PRODUCTS FROM THE CONSTRUCTION SITE, INCLUDING ITEMS DESIGNED FOR REMOVAL, CONSTRUCTION WASTE, CONSTRUCTION EQUIPMENT WASTE PRODUCTS (OIL, GAS, TIRES, ETC.), DRILLING MUD AND WATER, GARBAGE, GRUBBING, EXCESS CUT MATERIAL, VEGETATIVE DEBRIS, ETC., CAN BE DISPOSED OF ON-SITE.

AA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEANUP AND REPORTING OF SPILLS OF HAZARDOUS MATERIALS ASSOCIATED WITH THE CONSTRUCTION SITE. HAZARDOUS MATERIALS INCLUDES GASOLINE, DIESEL FUEL, MOTOR OIL, SOLVENTS, CHEMICALS, PAINT, ETC. WHICH MAY BE A THREAT TO THE ENVIRONMENT. TO REPORT, CALL 911 FIRST AND THEN CALL CALIFORNIA EMERGENCY MANAGEMENT AGENCY, CA STATE WARNING CENTER, 1-800-852-7550 OR 1-916845-8911.

AB. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS CONCERNING SURFACE AND UNDERGROUND WATER. CONTACT WITH SURFACE WATER BY CONSTRUCTION EQUIPMENT AND PERSONNEL SHALL BE MINIMIZED. EQUIPMENT MAINTENANCE AND REFUELING OPERATIONS SHALL BE PERFORMED IN AN ENVIRONMENTALLY SAFE MANNER IN COMPLIANCE WITH CITY, COUNTY, STATE, AND EPA REGULATIONS.

AC. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS CONCERNING CONSTRUCTION NOISE AND HOURS OF OPERATION AS STATED IN THE SPECIFICATIONS OR IMPOSED BY THE OWNER, CITY OR COUNTY AUTHORITIES.

TRAFFIC CONTROL

AD. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TRAFFIC CONTROL PLANS AND TRAFFIC CONTROL EQUIPMENT. ALL SIGNS, BARRICADES, CHANNELIZATION DEVICES, SIGN FRAMES AND ERECTION OF SUCH DEVICES SHALL CONFORM TO THE REQUIREMENTS OF "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" LATEST EDITION.

RECORD SURVEY:

AE. THE CONTRACTOR SHALL PROVIDE RECORD SURVEY, BY A CALIFORNIA LICENSED SURVEYOR, IN AUTOCAD FORMAT, PROVIDING FIELD VERIFIED LOCATIONS FOR THE PIPELINE, 1000' MINIMUM SPACING, TO INCLUDE VALVES, AND CHANGES IN DIRECTION.

MISCELLANEOUS SYMBOLS:

NOTE: SYMBOLS ARE NOT SHOWN TO SCALE ON PLAN OR PROFILE DRAWINGS, AND INDICATE APPROXIMATE LOCATION ONLY.

- APPARENT RIGHT-OF-WAY
- ENVIRONMENTAL CLEARED CORRIDOR
- EXIST WIRE FENCE
- EXIST CHAIN LINK FENCE
- EXISTING WOOD FENCE
- EXISTING TELEPHONE LINE
- EXISTING NATURAL GAS LINE
- EXISTING SANITARY SEWER LINE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND COMMUNICATION (UC)
- EXISTING WATER LINE
- EXISTING 6" HDPE WATER LINE
- NEW CLEAN WATER LINE (CLN)
- NEW CONTAMINATED WATER LINE (CON)
- NEW CHAIN LINK FENCE
- NEW WATER LINE
- SURVEY MONUMENT (PREVIOUS PROJECT)
- PROPOSED STRUCTURE
- DEPRESSION CONTOUR
- EXISTING MAJOR CONTOUR LINE AND ELEVATION DESIGNATION
- EXISTING MINOR CONTOUR LINE AND ELEVATION DESIGNATION
- SPOT ELEVATION (FT MSL)
- EXISTING ELECTRICAL BOX
- EXISTING SIGN
- EXISTING POWER POLE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING ELECTRIC PULLBOX
- EXISTING COMMUNICATIONS PEDESTAL
- EXISTING WATER VALVE
- EXISTING WATER SPIGOT
- EXISTING WATER HOOKUP
- EXISTING WELL
- EXISTING GAS CLEANOUT
- EXISTING STRUCTURE
- EXISTING BRIDGE
- EXISTING CULVERT
- FO — EXISTING FIBER OPTIC PEDESTAL
- T — EXISTING TELEPHONE PEDESTAL
- S — EXISTING SEWER MANHOLE
- EXISTING UNPAVED ROAD
- CAV VALVE

REGISTERED PROFESSIONAL ENGINEER — MONTE A. CHRISTIE — No. C58868 — GE2630 — EXP. 6/30/23 — CIVIL & GEOTECHNICAL — STATE OF CALIFORNIA

REV. NO.	DATE	DESCRIPTION	DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY

DATE OF ISSUE: 09/27/21
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DRAWN BY: RT
CHECKED BY: MC
APPROVED BY: MC

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COUNTY OF YOLO
DEPARTMENT OF COMMUNITY SERVICES
DIVISION OF INTEGRATED WASTE MANAGEMENT
44090 COUNTY ROAD 28H WOODLAND, CA 95776-9101

DIRECTOR
APPROVED ____________ 20____ R. E. NO.

YOLO COUNTY
LANDFILL EXTRACTION WELL PIPELINES
YOLO COUNTY, CALIFORNIA
GENERAL NOTES AND LEGEND

DRAWING NO. G02
PROJECT NO. AU17.1142

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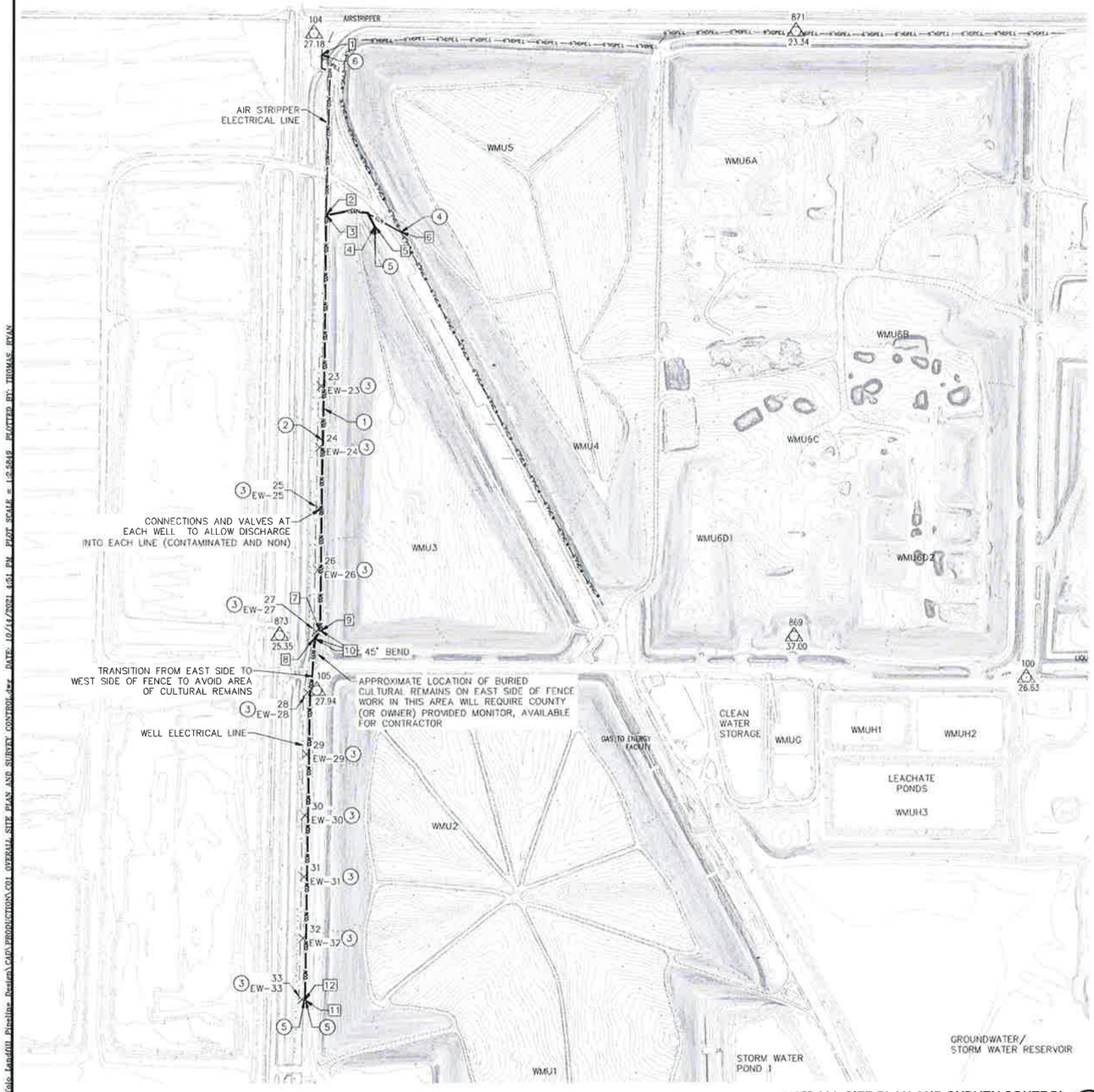
DATE: 10/13/2021 6:09 AM PLOTTED BY: THOMAS RYAN



OVERALL SITE PLAN AND SURVEY CONTROL (1)

SCALE: 1"=250'

NOTE:

EXISTING TOPOGRAPHY BASED ON AERIAL SURVEY PERFORMED BY R.E.Y. ENGINEERS, INC. ON XXXX X, XXXX.

BASIS OF COORDINATES

THE BEARINGS SHOWN HEREON ARE IN TERMS OF THE NORTH AMERICAN DATUM OF 1983 (NAD 83), EPOCH 1999.50 PER YOLO COUNTY SUBSIDENCE NETWORK. BASED LOCALLY UPON GPS OBSERVATIONS TO STATIONS "COY-1" AND "UCD1". THE COORDINATES WERE SCALED BY AN AVERAGE COMBINATION FACTOR OF 1.0000458B TO OBTAIN GROUND COORDINATES AND DISTANCES, COORDINATES ARE EXPRESSED IN U.S. SURVEY FEET.

BASIS OF COORDINATES

THE COORDINATES UPON WHICH THIS SURVEY IS BASED UPON ARE IN TERMS OF THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011, EPOCH 2010.0, STATE PLANE COORDINATES ZONE 2.

BASIS OF ELEVATION

THE ELEVATIONS SHOWN HEREON ARE IN TERMS OF THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED LOCALLY UPON STATION "COY-1", ELEVATION=28.05'.

Point Table – Control points			
Point #	Northing	Easting	Elevation
100	1979270.80	6652425.50	26.63
104	1981902.50	6649523.50	27.18
869	1979442.88	6651477.25	37.00
871	1981904.91	6651487.75	23.33
873	1979452.21	6649382.97	25.35

100 / 26.63 EXISTING CONTROL MONUMENT & ELEVATION

GENERAL NOTES:

1. MINIMUM PIPE BURIAL 3' TO TOP OF PIPE
2. ALL PIPING SHALL BE RESTRAINED

KEY NOTES:

(1) 6" HDPE PIPE, "CLEAN WATER", 3592 LF. INSTALL PER DETAIL 1 OR 2, DWG C02.

(2) 6" HDPE PIPE, CONTAMINATED WATER, 4120 LF. INSTALL PER DETAIL 1 OR 2, DWG C02.

(3) CONNECT EXISTING WELL TO BOTH PIPELINES, PER DETAIL 3, DWG C03.

(4) CONNECT CLEAN WATER HDPE PIPELINE TO EXISTING PVC SCH 40 AIR STRIPPER DISCHARGE PIPELINE.

(5) STUB/CAP AND PROVIDE 6" GATE VALVE FOR FUTURE CONNECTION.

(6) CONNECT TO AIR STRIPPER INFLOW HDPE LINE. PROVIDE 6" GATE VALVE.

Point Table			
Point #	Northing	Easting	Elevation
1	1981815.73	6649555.03	27.83
2	1981164.11	6649572.70	26.00
3	1981160.90	6649574.35	26.00
4	1981113.95	6649769.83	27.00
5	1981116.04	6649772.52	27.00
6	1981092.31	6649879.15	28.06
7	1979472.41	6649546.26	24.60
8	1979439.08	6649522.86	26.24
9	1979471.13	6649550.11	24.49
10	1979437.78	6649528.77	25.74
11	1977965.54	6649486.20	24.52
12	1977965.59	6649483.20	24.20

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STATE OF CALIFORNIA

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COUNTY OF YOLO
DEPARTMENT OF COMMUNITY SERVICES
DIVISION OF INTEGRATED WASTE MANAGEMENT
44090 COUNTY ROAD 28H WOODLAND, CA 95776-9101

DIRECTOR
APPROVED _____ 20____ R. E. NO.

YOLO COUNTY
LANDFILL EXTRACTION WELL PIPELINES
YOLO COUNTY, CALIFORNIA
OVERALL SITE PLAN AND SURVEY CONTROL

DRAWING NO. C01
PROJECT NO. AU17.1142

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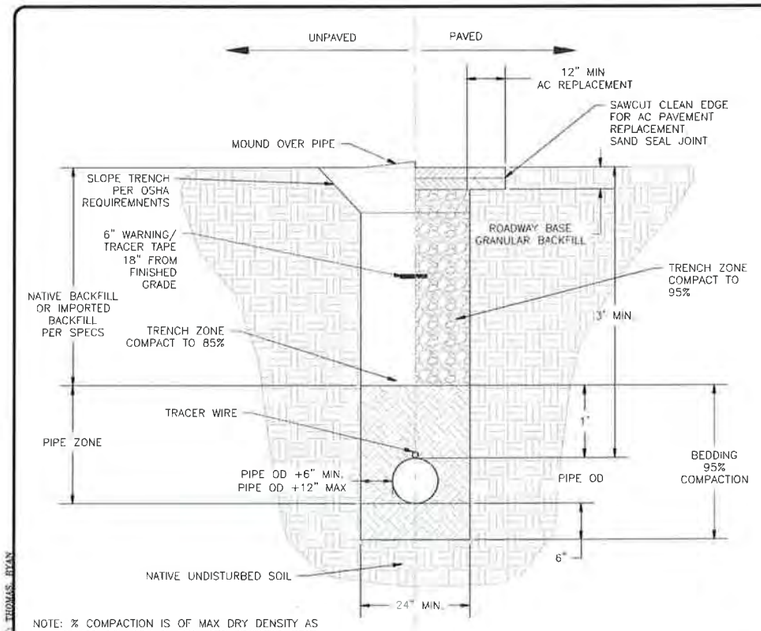
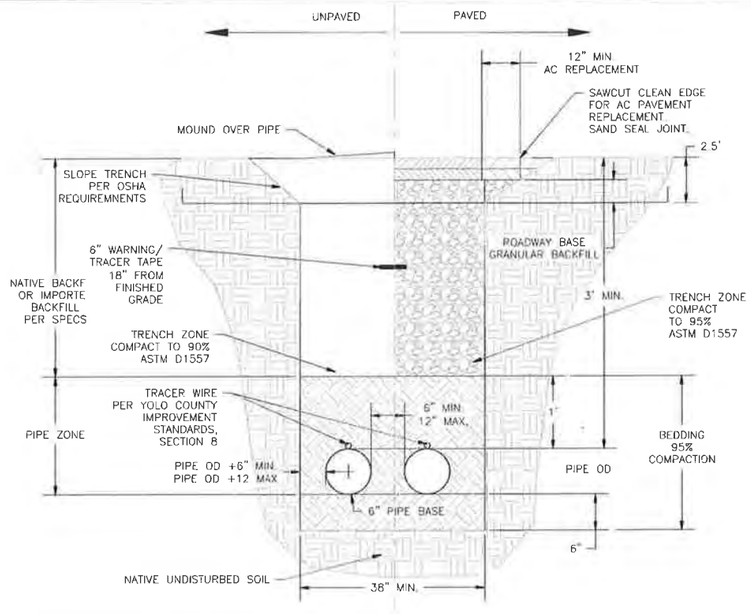
LOCATION: S:\Projects\AU17.1142 Yolo Landfill Pipeline Design\CAD\PRODUCTION\C01 OVERALL SITE PLAN AND SURVEY CONTROL.dwg DATE: 10/14/2021 1:51 PM PLOT SCALE = 1.0000 PLOTTED BY: THOMAS RYAN



NOTE: % COMPACTION IS OF MAX DRY DENSITY AS DETERMINED BY ASTM D-698, STD PROCTOR TEST

SINGLE PIPE TRENCH DETAILS (1/-)

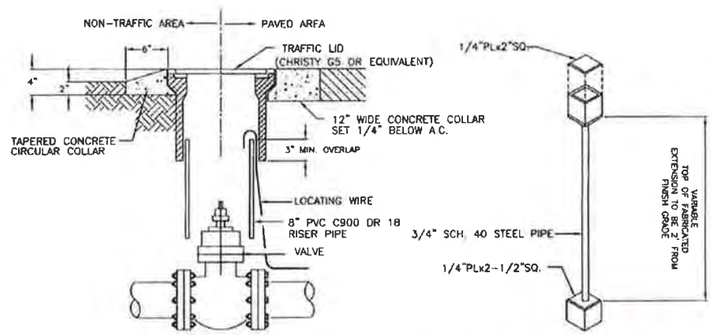
SCALE: NTS



NOTE: % COMPACTION IS OF MAX DRY DENSITY AS DETERMINED BY ASTM D-698, STD PROCTOR TEST

DOUBLE PIPE TRENCH DETAILS (2/-)

SCALE: NTS



TRAFFIC VALVE BOX

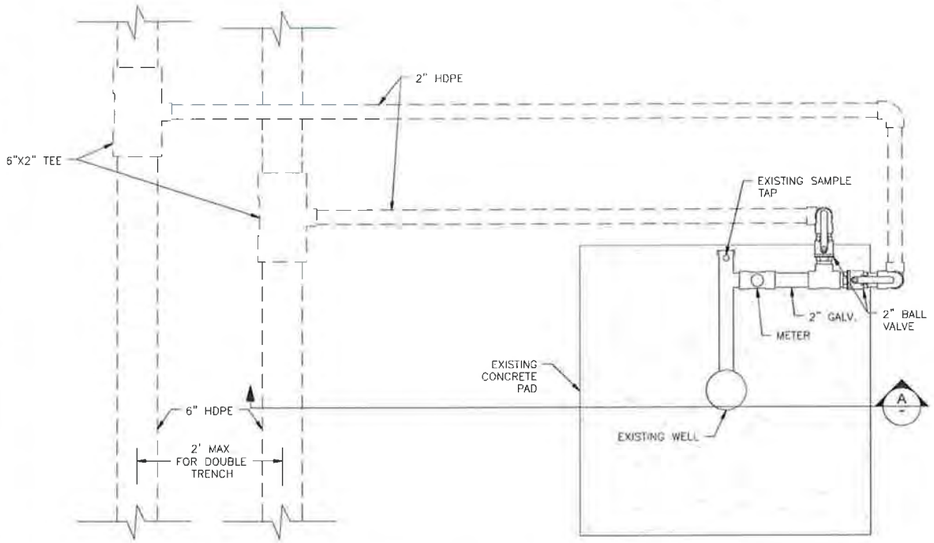
VALVE OPERATING NUT EXTENSION
(REQUIRED WHERE VALVE NUT IS IN EXCESS OF 4 FEET BELOW FINISH GRADE)

NOTES:

1. VALVE BOX AND RISER SHALL BE SET PLUMB AND CENTERED OVER WATER VALVE NUT.
2. SET VALVE BOX TO FINAL FINISH GRADE. IN AREAS WHERE THE FINISH GRADE HAS NOT BEEN DEFINED, PLACE 4"X4" LOCATING POST PAINTED BLUE WITHIN 1 FOOT OF VALVE BOX. POST SHALL BE 6 FEET IN LENGTH AND BURIED 3 FEET.
3. WRAP ALL FITTINGS AND DUCTILE IRON PIPE IN CLEAR 4-MIL HDPE.

VALVE BOX INSTALLATION DETAILS - YOLO COUNTY DWG #8-5 (3/-)

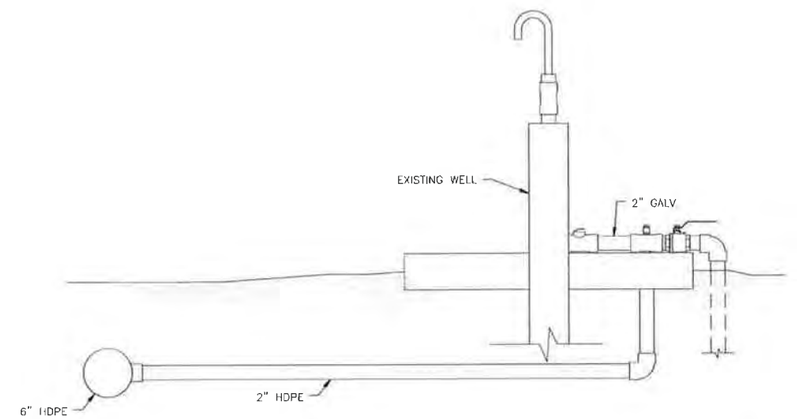
SCALE: NTS



NOTE:
ABOVEGROUND PIPING TO BE GALVANIZED, BELOW GROUND PIPE TO BE HDPE.

WELL CONNECTION PLAN DETAIL (4/-)

SCALE: NTS



WELL CONNECTION SECTION DETAIL (A/-)

SCALE: NTS

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STATE OF CALIFORNIA

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APPROVED _____ 20 ____ R E NO.

YOLO COUNTY
LANDFILL EXTRACTION WELL PIPELINES
YOLO COUNTY, CALIFORNIA
CIVIL DETAILS

DRAWING NO. C02
PROJECT NO. AU17.1142

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LOCATION: S:\Projects\AU17.1142 Yolo Landfill Pipeline Design\CAD\PRODUCTION\C02 CIVIL DETAILS.dwg DATE: 10/14/2021 5:02 PM PLOT SCALE = 1.0000 PLOTTED BY: THOMAS RYAN