

CONTRACT SPECIFICATIONS

For



CITY OF PLACERVILLE

MEASURE H&L PROJECT MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1

City Project Number: 41819

City of Placerville
3101 Center Street
Placerville, CA 95667

For use in connection with California Department of Transportation, Standard Specifications **Dated 2015** and Revised Standard Specification Dated February 12, 2016, and Caltrans Standard Plans, City of Placerville Standard Plans, State of California Labor Surcharge and Equipment Rental Rates, and Director of Industrial Relations General Prevailing Wage Rates.

October, 2019



**CITY OF PLACERVILLE
MOSQUITO ROAD STABILIZATION PROJECT -
PHASE 1**

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MOSQUITO ROAD STABILIZATION PROJECT –
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CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

CONTRACT DOCUMENTS

INCLUDING
NOTICE TO BIDDERS, PROPOSAL, AGREEMENT, AND SPECIAL
PROVISIONS

The various portions of the Contract Documents have been prepared under the direction of the following
licensed Civil Engineer, in accordance with California Business and Professions Code § 6735.

ACSchiestel

Registered Civil Engineer

October 14, 2019

Date



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CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION – PHASE 1**

Project No. 41819

BIDDING REQUIREMENTS

OCTOBER, 2019

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CITY OF PLACERVILLE, CALIFORNIA
ENGINEERING DEPARTMENT

**SECTION 00020
NOTICE TO BIDDERS**

NOTICE IS HEREBY GIVEN by the City of Placerville, State of California, that sealed bids for work in accordance with the Project Plans (Plans) and Contract Documents designated:

MOSQUITO ROAD STABILAZATION PROJECT - PHASE 1 - CIP NO. 41819

Will be received at the 3rd floor front counter at City Hall, 3101 Center Street, Placerville, California 95667, until Thursday, November 14, 2019 at 2:00 PM, at which time bids will be publicly opened and read aloud at the same address. No bid may be withdrawn after the time established for receiving bids or before the award and execution of the Contract, unless the award is delayed for a period exceeding one hundred and twenty (120) calendar days. Bids shall be executed in accordance with the instructions given and forms provided in the bound Contract Documents furnished by the City of Placerville, Engineering Department. All bids must be clearly marked on the envelope:

MOSQUITO ROAD STABILAZATION PROJECT - PHASE 1 - CIP NO. 41819

COST ESTIMATE (FOR BONDING PURPOSES): For bonding purposes, the anticipated project cost is less than \$1,100,000.

PRE-BID CONFERENCE: A non-mandatory pre-bid conference will be held at the Placerville Station, 2690 Mosquito Road, Placerville, CA 95667. The conference will be held on Wednesday, November 6, 2019 at 10 A.M. The project engineer will be available to answer bidder questions. All questions and answers will be documented and posted to www.publicpurchase.com following the meeting.

LOCATION/DESCRIPTION OF THE WORK: The project is located at on Mosquito Road in the City of Placerville, El Dorado County. The work to be done is shown on the Plans and described in the Specifications and generally consists of, but is not limited to:

- Construction and completion of approximately 1,472 LF of 8-inch water main, 188 LF of 4-inch water main, 14 residential services and meters, 4 fire hydrants, 2-inch dead-end blow-off, water sampling station, abandonment of the existing 6-inch water main, 38 LF of 6-inch sewer main, 4 cast-in-place sewer manholes, and 1,403 LF of cast-in-place-pipe (CIPP) sewer pipe lining in a minor arterial City street. Work includes, but is not limited to: soil excavation, rock excavation, backfilling, concrete, pipefitting, pipe abandonment, manhole and drain inlet removal, pressure testing, disinfection, connections to existing City facilities, site restoration, patch paving and trench paving, sewer bypass pumping, and all other work required in the Contract drawings. The contractor shall be Class "A" licensed.

- Project will require traffic control for equipment access and construction of the project by the Contractor and Subcontractor.
- Coordination and compliance is also required by the Contractor with various regulatory agencies including the City of Placerville, County of El Dorado, and State Regional Water Quality Control Board.

COMPLETION OF WORK: All work shall be completed within 75 working days after the date of the written notice to proceed from the City. Work within City streets is anticipated to occur during normal working hours from the hours of 7 am to 5 pm, Monday through Friday. No work shall be performed by the Contractor on Saturday or Sunday, or City designated holidays.

OBTAINING OR INSPECTING CONTRACT DOCUMENTS:

The Contract Documents and Plans are available on Monday, October 14, 2019 and may be examined or purchased for \$80 each at City of Placerville Engineering Department, 3101 Center Street, 3rd Floor, Placerville, CA 95667. Bidder assumes full responsibility for printing the contract documents to scale.

The Contract Documents and Plans may be previewed and downloaded from <http://cityofplacerville.org> and clicking on the "Projects out to Bid" button or by visiting <http://www.publicpurchase.com> and searching RFP # 41819. Access www.publicpurchase.com or contact support at support@publicpurchase.com for assistance with free vendor registration and access to this digital project information.

In order to submit a bid on this project, the digital contract documents must be downloaded for no cost through Public Purchase. This places you on the plan holders list and ensures receipt of addenda by email from publicpurchase.com. Only bidders on the plan holders list may submit a bid. Bidder is solely responsible for printing and binding the bid documents from the digital format before submitting the bid.

This is a locally funded project; subject to local regulations, City of Placerville code and ordinances, including wage rates, civil rights, etc.

All bidders' questions shall be submitted in writing to the City or via email at the contact information provided below. No oral responses to any questions concerning the content of the Plans and Contract Documents will be given. All responses will be in the form of written addenda to the Contract Documents and Plans. Inquires or question about alleged patent ambiguity of the plans, specifications, or estimate must be submitted as a bidder inquiry before bid opening. Bid inquiries must be received by 4:00 pm on the seventh (7th) business day before bid opening. After this time, the City will not consider these questions as bid protests.

City of Placerville
Engineering Department
Attn: A. Cory Schiestel, Associate Civil Engineer
3101 Center Street
Placerville, CA 95667
Email: cschiestel@cityofplacerville.org

CONTRACTOR'S LICENSE: In accordance with the Provisions of California Public Contract Code Section 3300, the City of Placerville has determined that the Contractor must possess a valid Class A General Engineering License and all other classes required by the categories and types of work included in this contract at the time of contract bid. Failure to possess the specified license shall render the bid as non-responsive and shall act as a bar to award of the contract to any bidder not possessing said license at the time of bid. The Contractor must possess a Class A license or a combination of Class C licenses that make up a majority of the work.

BUISNESS LICENSE: The Contractor must comply with all of the requirements of the City Business License Ordinance, where applicable, before beginning work and through Contract Acceptance.

GENERAL INFORMATION: Bids must be on unit price basis. The amount of bid for comparison purposes will be the total sum based on unit prices.

PREVAILING WAGE RATES: Pursuant to the Labor Code of the State of California, the Director of Industrial Relations has determined the general prevailing rate of wages and employer payments for health and welfare, vacation, pension, and similar purposes applicable to the work to be done. This rate and scale is available at the DIR website: <http://www.dir.ca.gov/DLSR/PWD> or from the City Clerk's office. The Contractor to whom the contract is awarded, and the subcontractors, must pay not less than these rates for this area to all workers employed in the execution of this contract.

DIR REGISTRATION: Effective March 1, 2015, all contractors and subcontractors shall be registered with DIR pursuant to Labor Code Section 1725.5 to be qualified to bid on this project or to be listed as a subcontractor for this project pursuant to Public Contract Code Section 4104. Bidders will be required to submit proof of registration for themselves and all listed subcontractors prior to award of the contract.

BID BOND: Each bid response shall be accompanied by the bid securities attachments provided at the end of these specifications and include cash, cashier's check, certified check, or Bidder's Bond made payable to the City of Placerville in the amount not less than ten percent (10%) of the total bid amount, such guaranty to be forfeited should the bidder to whom the contract is awarded fail to enter into the contract.

BONDS: The successful bidder will be required to furnish, prior to performance of any work hereunder, a payment bond in the amount equal to one hundred percent (100%) of the contract price, and a faithful performance bond in the amount of equal to one hundred percent (100%) of the contract price. The bonds must be approved by the City. As a condition precedent to the completion of this contract, the contractor shall furnish a Warranty Bond, in a form acceptable to the City in an amount of one hundred percent (100%) of the total contract price plus change orders, to hold good for a period of one year after the completion and acceptance of the work, to protect the City against the results of defective materials, quality of work, and equipment during that time. This bond shall be delivered to the City before the final payment under this contract will be made.

SUBSTITUTE SECURITIES FOR RETENTION MONEYS: In accordance with Part 5 (Section 22300), Division 2 of the Public Contract Code, a contractor may substitute securities for retention moneys withheld by a public agency to ensure performance under this contract. At the request and expense of the contractor, securities equivalent to the amount withheld shall be deposited with the City of Placerville, or with a state or federally chartered bank, as the escrow agent, who shall then pay such moneys to the contractor, and upon satisfactory completion of the contract, the securities shall be returned to the contractor.

SUBMISSION OF BIDS: The City Clerk will receive sealed bids until 2:00 pm on the bid open date at City Hall, 3rd Floor, and 3101 Center Street, Placerville, California. Bids received after this time will not be accepted. Bid proposals shall be sealed in an envelope plainly marked, "BID PROPOSAL FOR MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1 - CIP NO. 41819". Bids will only be accepted from registered plan holders. Bids not properly marked will be considered nonresponsive. The City will immediately open and publically read the bids at the mentioned location after the specified closing time.

REJECTION AND PROTESTS OF BIDS: The City reserves the right to reject any or all bids or any parts thereof and waive any irregularities or informalities in any bid or in the bidding to the extent permitted by law and to make awards in all or part of the best interest of the City. No bidder may withdraw his bid for a period of one hundred and twenty (120) calendar days after the date set for the bid opening. Bid protests must be submitted in writing to the attention of the City Clerk before 4:00 pm of the 3rd calendar day following the bid opening.

By: 

Rebecca Neves, P.E. City Engineer
City of Placerville

Date: 10/14/19

**SECTION 00100
INSTRUCTIONS TO BIDDERS**

1.0 WORK TO BE DONE

It is the intention of the Owner to construct improvements as shown and set forth in the Contract Documents titled: Mosquito Road Stabilization Project – Phase 1, dated October, 2019. All of the work is particularly set forth in the permits, plans and specifications, and all of said work, together with all other work incidental thereto, and is included. The work includes the furnishing of all labor, materials, taxes, incidentals and equipment necessary for completion of the project. Codes and standards, definition of words and terms, and abbreviations shall be as specified in Section 01060, REFERENCES.

2.0 EXAMINATION OF CONTRACT DOCUMENTS

Each Bidder shall thoroughly examine and be familiar with those Contract Documents and addenda (if any). The submission of a bid shall constitute an acknowledgment upon which the Owner may rely that the Bidder has thoroughly examined and is familiar with the Contract Documents. The failure or neglect of a Bidder to receive or examine any of the Contract Documents shall in no way relieve it from any obligation with respect to its bid or to the Contract. No claim for additional compensation will be allowed which is based upon a lack of knowledge of any Contract Documents.

3.0 INSPECTION OF PROJECT SITE AND PRE-BID ACCESS TO THE SITE

Prior to submitting a bid, it will be the sole responsibility of each bidder to conduct any additional examination, investigation, exploration, test, study or other inquiry and to obtain any additional information pertaining to the physical conditions (including surface, subsurface, and underground utilities) at or near the Project site that may affect the cost, progress, or performance of the Project, and that the bidder deems are necessary to prepare its bid for performance of the Project in accordance with the bid package and contract documents. Bidders seeking any such additional examination or other inquiries or information concerning the Project will do so at the bidder's sole expense.

Bidders seeking to conduct any additional examination or other inquiry at the Project site must request site access from the Owner in writing at least five (5) days in advance. The location of any excavation, boring or other invasive testing will be subject to approval on behalf of the Owner and any other agencies with jurisdiction over such testing. Bidders may not conduct tests at the Project site prior to obtaining Owner approval and entering into an executed Indemnity and Release Agreement with the City which will include applicable insurance.

Bidders who intend only to observe site conditions and not conduct such examinations are not required to provide an executed Indemnity and Release Agreement or insurance information. If, during the course of its site inspection, a Bidder finds conditions which appear to be in conflict with the letter or spirit of the Contract Documents, the Bidder may apply to the

Owner, in writing, for additional information and explanation at least seven (7) calendar days before the time specified for opening the bids.

Submission of a bid by the bidder shall constitute conclusive evidence that, if awarded the Contract, it has relied upon and is relying on its own examination of (1) the site of the work, (2) access to the site, (3) all other data and matters requisite to the fulfillment of the work and on its own knowledge of existing facilities on and in the vicinity of the site of the work to be constructed under the Contract, (4) the conditions to be encountered, (5) the character, quality and scope of the proposed work, (6) the quality and quantity of the materials to be furnished, and (7) the requirements of the Contract, the plans, the specifications, and other related information made available to Bidders by the Owner.

The information provided by the Owner is not intended to be a substitute for, or a supplement to the independent verification by the Bidder to the extent such independent investigation of site conditions is deemed necessary or desirable by the Bidder.

4.0 INTERPRETATION OF CONTRACT DOCUMENTS

No oral representations or interpretations will be made to any Bidder as to the meaning of the Contract Documents. Requests for an interpretation shall be made in writing and delivered by e-mail or U.S. Mail at least seven (7) business days before the time specified for opening the bids to:

City of Placerville
Engineering Department
Attn: A. Cory Schiestel, Associate Civil Engineer
3101 Center Street
Placerville, CA 95667
FAX: 530-642-5568
Email: cschiestel@cityofplacerville.org

All questions submitted via electronic telecommunication (e-mail) shall be submitted in the time set forth herein. For e-mail to be effective, it shall have a date and time receipt acknowledgment from the Owner and shall be clearly identified with the following title in the Subject line:

"Mosquito Road Stabilization Project – Phase 1: Bidder Questions"

It is the Bidder's sole responsibility to ensure that the e-mail question is received by the Owner in a timely manner. Upon receipt of an e-mail question, the Owner shall provide acknowledgement of receipt within 1 business day. If the Bidder does not receive an acknowledgement of receipt of an e-mail question from the Owner within the above referenced timeframe, Bidder shall assume the e-mail transmission was not received by the Owner, and shall be responsible for resubmitting the same in a timely manner, and if necessary by an alternate allowable method of transmission allowing for confirmation of receipt (e.g., facsimile).

Requests to clarify the source of materials, equipment, suppliers or any other such matter which does not modify, change, increase, or decrease the scope of work requires no action by the Owner other than a response to the Bidder requesting the clarification.

Requests to clarify possible ambiguous or incomplete statements or designs, or any other such clarification which modifies, changes, increases or decreases the scope of work, requires issuance of an addendum signed by the Owner and transmitted to all recipients of complete sets of Contract Documents. No other interpretation or information concerning the Contract Documents issued prior to the date specified for opening of bids will be binding.

5.0 INFORMATION AVAILABLE TO BIDDERS – CONTAMINATED SOIL MANAGEMENT PLAN

Contaminated soil was discovered during City potholing operations on Mosquito Road between station 5+00 and 10+00, and is expected to be encountered during trenching activities. Refer to the contaminated soil management plan enclosed in appendix F of the project specifications.

6.0 INFORMATION AVAILABLE TO BIDDERS – SUBSURFACE CONDITIONS

Although there is no geotechnical report available for this project, the City has discovered a 6" to 12" concrete base layer under existing asphalt concrete between station 3+00 and 7+50. There is a bid item for the removal of this concrete layer within the trench limits for the installation of new water main. The bid item will be paid on the actual quantity by linear foot of concrete base layer removed.

7.0 POSTPONEMENT OF OPENING

The Owner reserves the right to postpone the date and time for receiving and/or opening of bids at any time prior to the date and time established in the Notice of Invitation to Bid. Postponement notices may be faxed or emailed and will subsequently be mailed to planholders of record in the form of addenda.

8.0 OPENING OF BIDS

All bids, irrespective of any irregularities or informalities, if received on time, will be opened and publicly read aloud at the time and place set forth in the Notice Inviting Bids, provided that, if a mandatory pre-bid conference and/or walk-through is prescribed in Section 00020, NOTICE TO BIDDERS. Bidders, their representatives and other interested persons may be present at the opening and reading of bids.

Any bids received after the time for receiving and opening bids as set forth in the Notice to bidders or as postponed by addenda will not be opened. Any such bids will be returned, unopened, to the Bidder.

The public reading of each bid will include at least the following:

- A. Name and address of bidder.

- B. The total amount of bid.
- C. The nature and amount of the security furnished with the bid.
- D. Acknowledgement of addenda.

9.0 PREPARATION OF BID FORMS AND BIDDER'S CHECKLIST

Bids shall be made on the separately bound blank bid forms and must be submitted at the time and place stated in the Notice to Bidders. All blanks in the bid forms must be appropriately filled in, in permanent ink or typed, and all prices must be stated in figures.

All bids must be submitted in sealed envelopes bearing on the outside the name of the Bidder, its address, and the name of the project for which the bid is submitted. It is the sole responsibility of the Bidder to see that its bid is received before the time stipulated in the Notice to Bidders. A Bid will not be accepted after the date and time designated in the Notice to Bidders. Any Bid received after said date and time designated in the Notice to Bidders will be returned to the Bidder unopened. Owner shall not be responsible for errors or omissions in the bid. Bidders shall write their names on each bid form in the space provided.

The checklist shown below has been prepared and furnished to aid Bidders in including all necessary supporting information with their bid. Bidders' submittals should include, but are not limited to, the following:

ITEM	CHECKED
1. Proposal (Section 00310)	1._____
2. Acknowledge Addenda (Section 00310)	2._____
3. List of Subcontractors (Section 00310)	3._____
4. Public Contract Code Questionnaire and Statements (Section 00310)	4._____
5. Bidder's proof of DIR Registration	5._____
6. Non-collusion Declaration (Section 00310)	6._____
7. Power-of-Attorney for Surety's Agent to execute Bidder's Bond	7._____
8. Authority to sign Proposal if signature if is by agent other than officer of corporation, partner, or Owner	8._____

10.0 BIDDER'S SIGNATURE AND AUTHORITY

If the bid is made by an individual; bidder's name, signature, and post office address must be shown. If the bid is made by a firm or partnership; the name and post office address of the firm or partnership, a list of the partners, and the signature of at least one of the general partners must be shown. If the bid is made by a corporation; the bid shall show the name of the state under the laws of which the corporation is chartered, the name and post office address of the corporation, and the title of the person who signs on behalf of the corporation. If the bid is made by a corporation; a certified copy of the bylaws or resolution of the Board of Directors of the corporation shall be furnished, showing the authority of the officer signing the bid, to execute Contract on behalf of the corporation. If the bid is made by a joint venture, the bid shall be signed by a representative of the sponsoring partner of the joint venture. Additionally, the bid shall include a copy of the resolution or agreement empowering the representative to execute the bid and bind the joint venture.

All signatures on the bid shall be in longhand. Signature stamps are unacceptable and shall not be used.

11.0 DESCRIPTION OF BID ITEMS

See Item 2.0 of Section 01200, **MEASUREMENT AND PAYMENT** for complete description of each Bid Item.

12.0 ERASURES AND CORRECTIONS

The bid submitted must not contain any erasure, interlinear additions, or other corrections unless each such correction is authenticated. Authentication may be made by affixing in the margin, immediately opposite the correction, the signature of the person submitting the bid.

13.0 BID IRREGULARITIES

Changes in or additions to the bid form, recapitulations of the work bid upon, alternative bids, or any other modifications of the bid form which are not specifically called for in Section 00310 may result in rejection of the bid at the Owner's sole discretion. The Owner may treat all such bids as not being responsive to the Invitation to Bid. The Owner, at its' sole discretion may consider no oral, telephonic or email modification of any bid submitted.

14.0 MODIFICATION OF BID

Upon written request, a bid already received may be modified or withdrawn at any time before the time established for receiving bids. The request must be executed by the Bidder or its authorized representative as described in Paragraph 00100-10.0, **BIDDER'S SIGNATURE AND AUTHORITY**. Modifications shall be made in writing, executed, and submitted in the same form and manner as the original bid. Withdrawal of

a bid does not prejudice a bidder's right to submit a new bid within the time designated for the submission of bids. No bid may be withdrawn after the time established for receiving bids except as provided in Paragraph 00100-15.0, WITHDRAWAL OF BIDS.

15.0 WITHDRAWAL OF BIDS

In accordance with California Public Contract Code 5103, a bidder may withdraw its bid with the consent of the Owner. A Bidder desiring to withdraw its bid, after the time of opening the bids, shall give written notice to the Owner within five (5) days after opening of the Bids (excluding Saturdays, Sundays, or Owner holidays) of the alleged mistake.

The Bidder shall provide documentation in accordance with California Public Contract Code 5103. Bids cannot be changed because of mistake.

16.0 BID PROTEST

The lack of a prompt procedure to resolve disputes regarding the bidding process would impair the Owner's ability to carry out its purpose of constructing this project in a timely manner. Therefore, to the maximum extent authorized by law and notwithstanding any other procedures specified in documents referenced herein, all disputes and/or protests regarding the bidding process shall be subject to the following procedure. In submitting a bid to the Owner for this project, the bidder agrees to comply with and to be bound by this procedure.

Any Bid protest must be submitted in writing to the Project Owner before 4:00 p.m. on the third (3rd) calendar day following Bid opening.

- A. The initial protest document must contain a complete statement of the basis for the protest, and all supporting documentation.
- B. The party filing the protest must have actually submitted a Bid for the Work. A subcontractor of a party submitting a Bid for the Work may not submit a Bid protest. A party may not rely on the Bid protest submitted by another Bidder, but must timely pursue its own protest.
- C. The protest must refer to the specific portion of the Contract Document which forms the basis for the protest.
- D. The protest must include the name, address and telephone number of the person representing the protesting party.
- E. The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest which may be adversely affected by the outcome of the protest. Such

parties shall include all other Bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

- F. The Owner will give the protested Bidder five (5) working days after the receipt of the protest to submit a written response. The responding Bidder shall transmit the response to the protesting Bidder concurrent with delivery to the Owner.
- G. The procedure and time limits set forth in this paragraph are mandatory and are the Bidder's sole and exclusive remedy in the event of Bid protest. The Bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue the Bid protest, including filing a Government Code Claim or legal proceedings. A Bidder may not rely on a protest submitted by another Bidder, but must timely pursue its own protest.
- H. If the Owner determines that a protest is frivolous, the protesting bidder may be determined to be non-responsible and that bidder may be determined to be ineligible for future contract awards.

17.0 ADDENDA

Addenda issued during the time of bidding shall become a part of the documents furnished bidders for the preparation of bids, shall be covered in the bids, and shall be made a part of the Contract. Each bid shall include specific acknowledgment in the space provided of receipt of all Addenda issued during the bidding period. Failure to so acknowledge may result in the bid being rejected as not responsive. Failure of any bidder to receive such Addenda shall not be grounds for non-compliance with the terms of the instructions.

Addenda will be issued such that they should be received by each recipient of a complete set of Contract Documents no later than three (3) working days prior to the specified bid date. Addenda withdrawing the request for bids or postponing the bid deadline may be issued any time prior to the specified bid deadline.

18.0 BID GUARANTY

The bid form shall be accompanied by a bid guaranty bond provided by a surety company authorized to carry on business in the State of California with a minimum "A" rating with Best's Rating Guide for payment to the Owner in the sum of at least ten percent (10%) of the total amount of the bid price, or, alternatively, by a certified or cashier's check, payable to the Owner in the sum of at least ten percent (10%) of the total amount of the bid price. The bid guaranty bond shall be provided on the form included in Section 00310, PROPOSAL, of this Project Document. The amount payable to the Owner under the bid guaranty bond, or the certified or cashier's check and the amount thereof, as the case may be, shall be forfeited to the Owner as liquidated damages in case of a failure or neglect of the bidder to furnish, execute, and deliver to the Owner the required performance and payment bonds, evidences of

insurance; and to enter into, execute, and deliver to the Owner the Agreement on the form provided herewith, within ten (10) calendar days after receiving written notice from the Owner that the award has been made and the Agreement is ready for execution.

The bid guarantees the three lowest Bidders will be retained until the Agreement is signed, evidence of insurance provided, and satisfactory bonds furnished or other disposition made thereof. The bid guarantees will be returned to all but the lowest three responsive bidders upon written request from the Bidder. The bid guarantees from the lowest three bids will be available for return at the time they are considered null and void per terms of the Bid Guaranty Bond.

19.0 QUALIFICATION OF BIDDER

This section is not required for this project.

20.0 LOCAL BUSINESS LICENSE

The Contractor shall have a local business license for the work contemplated before the Contract can be executed. All subcontractors will be required to secure the appropriate local business license before they commence work on the project.

21.0 WORK PERCENTAGES

The Contractor shall perform at least fifty percent (50%) of the Contract Bid Amount. This portion of work shall encompass the performance of work by the Contractor's forces and equipment, the procurement of materials and equipment by the Contractor and field related general conditions required to support and supervise the construction effort. Subcontractors shall not be responsible for the performance of any work or procurement of materials or equipment within the above Contractor's work percentage allotment.

The value of the work subcontracted shall be determined by summing all of the percentages identified for the subcontractors listed in Section 00310. If the sum of such percentages exceeds fifty percent (50%), the Owner may treat the bid as nonresponsive and reject it on that basis.

22.0 SUBCONTRACTORS

In accordance with California Public Contract Code Section 4100, et seq., "Subletting and Subcontracting Fair Practices Act," each general bid shall have listed in Section 00310, **PROPOSAL**, the name, California contractor license number, location of the place of business and the portion of work to be performed by each subcontractor who will perform work or labor or render service to the bidder in or about the construction of the work or improvement, or of any subcontractor licensed by the State of California who, under subcontract to the bidder, will specially fabricate and install a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent of the bidder's total bid.

Failure to list subcontractors may render the bid non-responsive and may be grounds for rejection of the bid. Failure to comply with the provisions of the California "Subletting and Subcontracting Fair Practices Act" shall make the Contractor subject to the sanctions as set forth in the Act.

Alternate subcontractors shall not be listed for the same work.

23.0 SOLE-SOURCED ITEMS AND SUBSTITUTIONS DURING BIDDING

Bidders are advised that, in accordance with Public Contract Code Section 3400, the Owner has made a finding that particular materials, products, things or services are designated by specific brand or trade names in order to match other materials, products, things or services in use or to obtain necessary items available only from one source. By listing a sole-source vendor, Owner has only identified a particular product the supply of which will conform to the Contract. Owner does not warrant in any respect the performance of any designated sole-source vendor. Owner shall not be responsible for, and Contractor shall not be excused for, any failure of a sole-source vendor to supply a conforming product in a timely fashion. Bidders shall refer to individual specification sections for specific requirements.

Contractors, manufacturers or suppliers of materials and equipment may offer an alternative product and request the alternatives to specified products be considered equal unless the Owner has sole-sourced a product in accordance with Public Contract Code 3400. Inclusion of such alternatives in the bid is the sole responsibility of the Contractor. Inclusion of the proposed alternative should only be considered if it is the Contractor's sole belief the offered alternative is equal in quality and performance to the specified product. After award of the Contract, such offers of alternative products will be reviewed and processed as a substitution as provided under Section 01330-11.0, **SUBSTITUTES OR "OR EQUAL" ITEMS AND PRODUCT OPTIONS**. If the material, equipment, process or article offered by the contractor is not, in the Owner's sole opinion, substantially equal or better in respect to that specified, then the contractor shall furnish that material, process or article specified or one that in the Owner's opinion is substantially equal or better in every respect.

24.0 BIDDERS INTERESTED IN MORE THAN ONE BID

No person, firm, or corporation, under the same or different name, shall make, file, or be interested in more than one bid for the same work unless alternate bids are called for. A person, firm, or corporation may, however, submit sub-proposals or quote prices on materials to more than one bidder.

Pursuant to Public Contract Code Section 7106, Bidders shall execute and furnish with their bids Section 00310, **NON-COLLUSION DECLARATION**. Reasonable grounds to believe that any individual, partnership, corporation, or combination is interested in more than one bid for the proposed work may cause rejection of all bids in which that individual, partnership, corporation, or combination is interested.

25.0 SHEETING, SHORING AND BRACING

Pursuant to the provisions of California Labor Code Section 6707, each bid submitted shall contain, in the bid item indicated, the amount included in its bid for adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life and limb in trenches and open excavation, which shall conform to applicable safety orders. By listing this sum, the Bidder warrants that its action does not convey tort liability to the Owner, the Design Consultant, the Construction Manager, and their employees, agents, and subconsultants.

26.0 WAGE RATES

Pursuant to provisions of the Labor Code Section 1770, et seq., of the State of California, the Director of the Department of Industrial Relations has ascertained the prevailing rate of per diem wages of the locality in which the Work is to be performed and applicable to the work to be done.

Bidders shall promptly notify the Owner, in writing, of any and all classifications of labor not listed in the prevailing wage determinations but necessary for the performance of the Work, before bids are submitted.

27.0 OFFER OF ASSIGNMENT OF ANTITRUST ACTIONS

As provided by Section 4552, et. seq., of the California Government Code, in submitting a bid to the Owner, the Bidder offers and agrees that if the bid is accepted, it will assign to the Owner all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the Bidder for sale to the Owner pursuant to the bid. Such assignment shall be made and become effective at the time the Owner tenders final payment to the Bidder.

28.0 ASSIGNMENT OF CONTRACT

Any attempted assignment by the Contractor of any contract to be entered into hereunder, or any part thereof, or of funds to be received thereunder by the Contractor, is void unless such assignment has prior written approval of Owner, and the Surety has been given due notice of such assignment in writing and has consented thereto in writing.

29.0 REJECTION OF BIDS

The Owner reserves the right to reject any and all bids and further reserves the right to reject any bids which are nonresponsive, incomplete, obscure, or irregular; any bids which omit a bid on any one or more items on which the bids are required; any bids in which unit prices are unbalanced in the opinion of the Owner; any bids accompanied by

insufficient or irregular bid guaranty; and bids from Bidders who failed to perform properly or complete on time past City projects.

The Owner also reserves the right to waive irregularities in a bid or bidding procedure.

30.0 EVALUATION OF BIDS AND AWARD OF CONTRACT

After the Proposals have been opened and read, they will be checked for accuracy and compliance with the Contract Documents. If a Contract is awarded, it will be to the lowest responsive, responsible, qualified Bidder whose bid complies with the specified requirements, as it may best serve the interests of the Owner. All bids will be compared on the basis of the Engineer's estimate of the quantities of work to be done. The selection of any or all alternates or bid schedules shall be at the sole discretion of the Owner. The Owner reserves the right to reject an unbalanced bid which is a bid having nominal prices for some bid items and enhanced prices for other bid items.

The criteria which will be used to determine the lowest responsive and responsible Bidder are as follows:

Responsive Bidder: Means a Bidder who has submitted a Bid which conforms in all material respects to the Bidding Documents.

Responsible Bidder: Means a Bidder who has the capacity and capability in all respects to perform fully the contract requirements and who has the integrity and reliability to assure good faith performance. Among factors to be considered in determining whether the Bidder meets these standards, are:

- A. Financial, material, equipment, facility, and personnel resources and expertise necessary to meet contractual requirements;
- B. A record of integrity;
- C. A record of Successful Project Completions defined as:
 - 1. Completion of project on time and without liquidated damages.
 - 2. Completion of project without excessive defective work issues.
 - 3. Completion of project without excess claims or disputes issues;
- D. Qualified legally to contract with the OWNER, and;
- E. Has not failed to supply any necessary information in connection with the inquiry concerning responsibility.

In the evaluation of any bid, the Owner shall have the right to consider information provided by sources other than Bidder.

Within one hundred and twenty (120) days after the time of opening of the bids, the Owner will act either to accept a bid, to reject all bids or with the consent of the Bidders and their sureties to extend the time in which the Owner may act. The acceptance of a bid will be evidenced by a Notice of Award of Contract in writing, delivered in person or by mail to the Bidder whose bid is accepted. No other act of Owner will constitute acceptance of a bid. The Award of Contract shall obligate the Bidder whose bid is accepted to furnish performance and payment bonds and evidences of insurance, and to execute the Agreement in the form set forth in the Contract Documents. The Contract will require the completion of the work according to the Contract Documents.

Only one Contract will be awarded.

31.0 EXECUTION OF CONTRACT

The Agreement shall be executed by the successful bidder and returned, together with the Contract bonds and evidences of insurance, within fifteen (15) calendar days after receiving written Notice of Award of the Contract. Time is of the essence in this regard. After execution by Owner, one copy of the Agreement shall be returned to Contractor.

The failure to execute the Contract Documents or to furnish the bonds or insurance required by these instructions within fifteen (15) calendar days after receiving written notice of the Award of the Contract constitutes default. In case of default, the Owner may, at its sole discretion, award the Contract to the next lowest Bidder or may re-advertise the project for new bids. If a more favorable bid is received by re-advertising, the defaulting Bidder shall have no claim against the Owner for a refund.

If a Bidder to whom an award is made fails or refuses for any reason to execute the Contract or fails to furnish any or all of the required insurance or Contract Bonds in proper form, within the time stated, it is agreed and stipulated between Owner and the Bidder to whom any award is made that damage has been and will be sustained by the Owner. It is further agreed by the Owner and any and all Bidders that it will be impractical and extremely difficult to fully ascertain and determine the actual damage that the Owner will sustain by such delay. Therefore, the Owner and all parties who submit a Bid under the Notice Inviting Bids shall be deemed to have jointly studied and attempted to estimate the damages suffered by the Owner by such delay under these circumstances and agree that the amount of the Bidder's bond or check is agreed to as the liquidated damages payable by such Bidder(s). This Bidder's bond or check will be collected and held by the Owner as the sole property of the Owner for full compensation for the damages suffered by the Owner as a result of the Bidder's failure to execute the Contract and furnish the Bonds and Insurance as required.

32.0 CONTRACT AND BONDS

The successful Bidder, simultaneously with the execution of the Agreement, will be required to furnish a Payment Bond equal to one hundred percent (100%) of the

Contract Price, a Faithful Performance Bond equal to one hundred (100%) of the Contract Price, the **WORKERS' COMPENSATION INSURANCE CERTIFICATE** in Section 00510 and evidences of required insurance. Said insurance and bonds shall be secured from a surety company satisfactory to Owner with a minimum "A" rating with Best's Rating Guide.

The form of Agreement, as provided in Section 00510, **AGREEMENT** which the successful Bidder as Contractor will be required to execute, and the forms of bonds, which it will be required to furnish, shall be carefully examined by the Bidder. The Faithful Performance Bond is to secure the faithful performance of the Contract, and the Payment Bond is to secure payment for those to whom the Bidder may become legally indebted for labor, materials, tools, equipment, or services of every kind used or employed by the Bidder in performing the work.

33.0 LIST OF RECIPIENTS OF FULL SETS OF CONTRACT DOCUMENTS

Bidders may obtain a current listing of all recipients of complete sets of Contract Documents. This list will also include all plan rooms that were sent Contract Documents. To obtain a list, call the City of Placerville Engineering Department at 530-642-5250 or email your request to cschiestel@cityofplacerville.org.

*****END OF SECTION*****

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**SECTION 00310
PROPOSAL**

**To: CITY OF PLACERVILLE,
COUNTY OF EL DORADO,
STATE OF CALIFORNIA**

For the construction of

MOSQUITO ROAD STABILIZATION PROJECT - PHASE 1 - PROJECT No. 41819

Bid Opening: November 14, 2019 at 2:00 p.m.

NAME OF BIDDER

BUSINESS POST OFFICE BOX

CITY, STATE, ZIP

BUSINESS STREET ADDRESS
(PLEASE INCLUDE EVEN IF POST OFFICE BOX USED)

CITY, STATE, ZIP

TELEPHONE NO. AREA CODE (.....)

FAX NO. AREA CODE (.....)

The work for which this Proposal is submitted is for the construction in accordance with these Contract Documents (including the payment of not less than the State general prevailing wage rates or Federal minimum wage rates set forth herein), the Project Plans described below, including any addenda thereto, the Contract annexed hereto, and also in accordance with the California Department of Transportation Standard Plans and Standard Specifications, and the Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished, and in accordance with the General Prevailing Wage rates. The Project Plans and Contract Documents for the work to be done are entitled:

MOSQUITO ROAD STABILIZATION PROJECT - PHASE 1 - PROJECT No. 41819

Bids are to be submitted for the entire work, including additive alternates, if any. The amount of the bid for comparison purposes will be the total of all the base and optional bid items.

The Bidder shall set forth for each unit basis item of work a unit 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 "Item Total" column shall be the product of the unit price bid and the estimate 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 total column for the item shall prevail and shall be divided by the estimate 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 total, whichever most closely approximates percentage wise the unit price or item total in the Department's Final Estimate of Cost.

If this Proposal is accepted and the undersigned Bidder shall fail to enter into the Contract and furnish the two bonds in the sums required by the State Contract Act, with surety satisfaction to the City of Placerville within eight days, not including Sundays and legal holidays, after the bidder has received notice from the City of Placerville that the Contract has been awarded, the City of Placerville may, at its option, determine that the Bidder has abandoned the Contract, and thereupon this Proposal and the acceptance thereof shall be null and void and the forfeiture of such security accompanying this Proposal shall operate and the same shall be the property of the City of Placerville.

The undersigned, as Bidder, declares under penalty of perjury under the laws of the State of California that the only persons or parties interested in this Proposal, as principals, are those named herein; that this Proposal is made without collusion with any other person, firm, or corporation; that he has carefully examined the location of the proposed work, the annexed proposed form of Contract, and the Plans therein referred to; and he proposes, and agrees if this Proposal is accepted, that he will contract with the City of Placerville, in the form of the copy of the Contract annexed hereto, to provide all necessary machinery, tools, apparatus, and other means of construction, and to do all the work and furnish all the materials specified in the Contract, in the manner and time therein prescribed, and according to the requirements of the Engineer as therein set forth, and that he will take in full payment therefore the following item prices, to wit:

CONTRACTOR'S BID AND BID PRICE SCHEDULE

MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1 - PROJECT No. 41819

ITEM NO.	BID ITEM	UNIT OF MEASURE	ESTIMATED QUANTITY	ITEM PRICE	LINE TOTAL
1	MOBILIZATION/DEMOBILIZATION	LS	1	\$	\$
2	CONSTRUCTION AREA SIGNS	EA	2	\$	\$
3	POTHOLE EXISTING FACILITIES	LS	1	\$	\$
4	SITE SAFETY/TRAFFIC CONTROL SYSTEM	LS	1	\$	\$
5	WATER POLLUTION CONTROL PROGRAM	LS	1	\$	\$
6	PIPE ABANDONMENT	LS	1	\$	\$
7	REMOVE EXISTING FACILITIES	LS	1	\$	\$
8	4-INCH CONNECTION TO EXISTING	EA	1	\$	\$
9	6-INCH CONNECTION TO EXISTING	EA	4	\$	\$
10	8-INCH CONNECTION TO EXISTING	EA	1	\$	\$
11	4-INCH PVC C900 POTABLE WATER LINE & APPURTENANCES (NO T-CUT)	LF	188	\$	\$
12	8-INCH PVC C900 POTABLE WATER LINE & APPURTENANCES (NO T-CUT)	LF	586	\$	\$
13	8-INCH PVC C900 & POTABLE WATER LINE APPURTENANCES	LF	886	\$	\$
14	6-INCH GATE VALVE	EA	1	\$	\$
15	8-INCH GATE VALVE	EA	8	\$	\$
16	1-INCH WATER SERVICE AND METER ONLY (NO PRESSURE REGULATOR)	EA	1	\$	\$
17	2-INCH WATER SERVICE ONLY (CONNECT TO EXISTING METER)	EA	1	\$	\$
18	1-INCH SERVICE (TYPE 1)	EA	5	\$	\$
19	1-INCH SERVICE (TYPE 2)	EA	8	\$	\$
20	FIRE HYDRANT ASSEMBLY	EA	4	\$	\$
21	WATER QUALITY SAMPLING STATION	EA	1	\$	\$
22	2-INCH DEAD END BLOW-OFF & COMBINATION AIR VALVE	EA	1	\$	\$
23	CONTAMINATED SOIL DISPOSAL (CLASS II)	CY	150	\$	\$
24	CONTAMINATED SOIL DISPOSAL (CAL HAZ)	CY	50	\$	\$
25	CONTAMINATED SOIL DISPOSAL (OFFSITE REUSE)	CY	50	\$	\$

26	WATER MAIN PRESSURE TESTING	LS	1	\$	\$
27	WATER MAIN DISINFECTION	LS	1	\$	\$
28	8-INCH ACP LINING (CURED-IN-PLACE PIPE)	LF	1403	\$	\$
29	12-INCH CMP LINING (CURED-IN-PLACE PIPE)	LF	45	\$	\$
30	18-INCH CMP LINING (CURED-IN-PLACE PIPE)	LF	43	\$	\$
31	21-INCH CMP LINING (CURED-IN-PLACE PIPE)	LF	41	\$	\$
32	6-INCH PVC SEWER PIPE (SDR-26) AND APPURTANANCES	LF	38	\$	\$
33	SEWER CLEAN-OUT	EA	1	\$	\$
34	48-INCH CAST-IN-PLACE SEWER MANHOLE	EA	4	\$	\$
35	VERTICAL CURB & GUTTER	LF	12	\$	\$
36	5-FOOT SIDEWALK	SF	60	\$	\$
37	2-INCH HMA REMOVE & REPLACE	SF	3000	\$	\$
38	8-INCH HMA REMOVE & REPLACE	SF	1920	\$	\$
39	CONCRETE BASE LAYER EXCAVATION	LF	450	\$	\$
40	BOLLARD	EA	4	\$	\$
TOTAL BASE CONTRACT (FIGURE)		\$			
TOTAL CONTRACT (FIGURE)		-			

TOTAL BASE BID AMOUNT _____

_____ Dollars and _____ Cents.
 AMOUNT IN WRITING

Sign Here ☐ _____ Date: _____
 CONTRACTOR

 PRINT SIGNATURE NAME AND TITLE OF BIDDER

(NOTICE: Bidder's failure to execute the questionnaires and statements contained in this Proposal as required by applicable laws and regulations, or the determinations by City of Placerville based upon those questionnaires and statements, may prohibit award of the subject Contract to the Bidder.)

BIDDER'S PROOF OF DIR REGISTRATION

The Bidder agrees that its Proof of DIR Registration pursuant to Labor Code Section 1725.5 is attached hereto and made a condition of this bid.

SUBCONTRACTORS LISTING

The Bidder shall list the name and address of each subcontractor to whom the Bidder proposes to subcontract portion of the work, as required by the provisions in "Required Listing of Proposed Subcontractors" in Section 2 of the Standard Specifications.

NAME	LOCATION OF BUSINESS	LICENSE No.	PORTION OR TYPE OF WORK

PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has ☐, has not ☐ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

NOTE: The bidder must place a check mark after "has" or "has not" in one of the spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE

In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal state, or local government project because of a violation of law or a safety regulation?

Yes ☐ No ☐

If the answer is yes, explain the circumstances in the following space:

PUBLIC CONTRACT CODE SECTION 10232 STATEMENT

In conformance with Public Contract Code Section 10232, the Contractor hereby states, under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

NOTE: The above Statement and Questionnaire are part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement and Questionnaire. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

**NONCOLLUSION AFFIDAVIT
(Title 23 United States Code Section 112 and
Public Contract Code Section 7106)**

In conformance with Title 23 United States Code Section 112 and Public Contract Code Section 7106, the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidders has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in 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, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

NOTE: The above Noncollusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Noncollusion Affidavit. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

BUSINESS AND PROFESSIONS CODE SECTION 7028.15 STATEMENT

In accordance with the Business and Professions Code Section 7028.15, the Contractor hereby states, under penalty of perjury, that he/she is licensed in accordance with an act providing for the State of California registration of Contractors,

License No. _____, Classification(s) _____
Expiration Date _____

By my signature on this proposal, I certify, under penalty of perjury under the laws of the State of California, that the foregoing questionnaire and statements of Public Contract Code Section 10162, 10232, and 10285.1 are true and correct and that the bidder has complied with the requirements of Section 8103 of the Fair Employment and Housing Commission Regulation (Chapter 5, Title 2 of the California Administrative Code). By my signature on this proposal, I further certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Noncollusion Affidavit required by title 23 United States Code Section 11 2 and Public Contract Code Section 7106 are true and correct.

Date: _____

SIGNATURE AND TITLE OF BIDDER _____

NAME OF FIRM _____

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

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

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

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

License No. _____ Classification(s) _____

!(A copy of the afore-referenced license must be attached hereto)!

ADDENDA:

RECEIPT OF COPIES OF THE FOLLOWING ADDENDA(S) IS HEREBY ACKNOWLEDGED.

<u>ADDENDUM NO.</u>	<u>BIDDER'S SIGNATURE</u>	<u>DATE ACKNOWLEDGED</u>

_____	_____	_____
_____	_____	_____
_____	_____	_____

By my signature on this proposal, I certify, under penalty of perjury under the laws of the State of California, that the foregoing questionnaire and statements of Public Contract Code Sections 10162, 10232, and 10285.1 are true and correct and that the Bidder has complied with the requirements of Section 8103 of the Fair Employment and Housing Commission Regulations (Chapter 5, Title 2 of the California Administrative Code). By my signature on this Proposal, I further certify, under penalty of perjury under the laws of the State of California and the United States of America that the Noncollusion Affidavit required by Title 23 United States Code, Section 112 and Public Contract Code Section 7106 are true and correct.

The person or persons executing this Proposal on behalf of a corporation or partnership shall be prepared to demonstrate by resolution, article, or otherwise, that such person is or that such persons are

appropriately authorized to act in these regards for such corporation or partnership. Such authority shall be demonstrated to the satisfaction of the City of Placerville.

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

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

Executed this _____ day of _____, 2019

at _____ County, State of _____

SIGN HERE ○ _____

Name and Title of Bidder _____

Name of Firm _____

***** END OF PROPOSAL *****

CITY OF PLACERVILLE

BIDDER'S BOND
! (this form MUST be used) !

KNOW ALL PEOPLE BY THESE PRESENTS, THAT WE

_____, as PRINCIPAL, and
_____ as Surety are held and firmly bound unto the City of Placerville (Obligee) in the penal sum of TEN (10) PERCENT OF THE AMOUNT OF THE TOTAL BID PRICE of the Principal above named, submitted by said Principal to the Obligee for the work, for the payment of which sum in lawful money of the United States, well and truly to be made to the Obligee, we the Principal and surety bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents. In no case shall the liability of the surety hereunder exceed the sum of

\$ _____

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal has submitted the above-mentioned bid to the Obligee, as aforesaid, for certain construction specifically described as follows, for which bids are to be opened at Placerville, El Dorado County, California, on November 14, 2019 at 2:00 p.m. for the construction of the

MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1 - PROJECT No. 41819

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

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

IN WITNESS WHEREOF, we have set our hands and seals on this _____ day of _____ 2019.

SIGNATURES

(SEAL) _____ Principal

(SEAL) _____ Surety

Address: _____

(NOTE: Signature of those executing for the Surety shall be properly acknowledged, and accompanied by a Certificate of acknowledgment.)



CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

CONTRACT FORMS AND REQUIREMENTS

OCTOBER, 2019

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**SECTION 00500
NOTICE OF AWARD**

Date: _____

To: _____
(Name of Bidder)

Address: _____

Project: Mosquito Road Stabilization Project – Phase 1

Project No.: 41819

You are notified that your Bid dated _____ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for the construction and completion of a new water main on Mosquito Road from Clay Street to City Limit. Construction includes, but is not limited to: approximately 1,472 LF of 8-inch water main, 188 LF of 4-inch water main, 14 residential services and meters, 4 fire hydrants, 2-inch dead-end blow-off, water sampling station, abandonment of the existing 6-inch water main, 38 LF of 6-inch sewer main, 4 cast-in-place sewer manholes, and 1,403 LF of cast-in-place-pipe (CIPP) sewer pipe lining in a minor arterial City street. Work includes, but is not limited to: soil excavation, rock excavation, backfilling, concrete, pipefitting, pipe abandonment, manhole and drain inlet removal, pressure testing, disinfection, connections to existing City facilities, site restoration, patch paving and trench paving, and traffic control, and all other work required in the Contract drawings.

(Indicate total Work, alternates or sections of Work awarded.)

The Contract Price of your Contract is _____ Dollars (\$_____).

Two (2) copies of each of the proposed Section 00510, Agreement for Construction accompany this Notice of Award.

You must comply with the following conditions precedent within fifteen (15) days of the date you receive this Notice of Award.

1. Deliver to City of Placerville – Engineering Department two (2) signed copies of the Agreement, as found in Section 00510, leaving the date blank.
2. Deliver with the Agreement an appropriate Certificate of Authorization.
3. Deliver with the Agreement the Contract Bonds as specified in Section 00100, INSTRUCTIONS TO BIDDERS and Section 00700 City of Placerville Special Provisions.

4. Deliver with the Agreement a signed Certification of Drug-Free Workplace found in Section 00640.
5. Deliver with the Agreement a signed Workers' Compensation Insurance Certificate found in Section 00645.
6. Deliver with the Agreement all required original Insurance Certificates and endorsements as required in the City of Placerville Special Provisions.
7. Other conditions precedent: NONE

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award and declare your Bid security forfeited.

Within ten (10) calendar days after you comply with the above conditions, Owner will return to you one fully executed Agreement for your records.

CITY OF PLACERVILLE

By: _____

Its: _____

Copy to Owner's Representative
Construction Manager
City Engineer

*****END OF SECTION*****

**SECTION 00510
CONTRACT (AGREEMENT)**

**CITY OF PLACERVILLE
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

PROJECT NO.: 41819

THIS AGREEMENT ("Agreement") approved by the City Council this _____ day of _____, in the year of 2019, made and concluded, in duplicate, between the CITY OF PLACERVILLE, a political subdivision of the State of California, by the Development Services Department hereinafter called "City," and _____ hereinafter called "Contractor."

WITNESSETH:

WHEREAS, City has caused the above-captioned project to be let to formal bidding process, and

WHEREAS, Contractor has duly submitted a bid response for the captioned project upon which City has awarded this contract;

NOW, THEREFORE, the parties hereto have mutually covenanted and agreed, and by these presents do covenant and agree, each with the other, as follows:

Article 1. THE WORK

The Contractor shall complete the Work as specified or indicated under the Bid Schedule(s) and all work described in the City's Contract Documents entitled:

MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1 - PROJECT NO.: 41819

The project is located in the City of Placerville in El Dorado County in the State of California. The Work to be done is shown on the Plans, described in the Special Provisions.

Article 2. CONTRACT DOCUMENTS

The Contract Documents consist of: the Notice to Bidders; the bid forms which include the accepted Proposal, Bid Price Schedule and Total Bid, Subcontractors Listing, Section 10285.1 Statement, Section 10162 Questionnaire, Section 10232 Statement, Noncollusion Affidavit, Bidder's Bond; the Contract which includes this Agreement, Workers Compensation Certificate, Performance Bond, and Payment Bond; the drawings listed and identified as the Project Plans; the Special Provisions and all Addenda incorporated in those documents before their execution, and all Contract Change Orders issued in accordance with the Contract Documents which may be delivered or issued after the Effective Date of this Agreement and are not attached hereto; the prevailing Labor Surcharge And Equipment Rental Rates (when required) as determined by the Department of Industrial Relations to be in effect on the date the Work is accomplished; and all the obligations of City and of Contractor which are fully set forth and described therein; all Contract Documents which are hereby specially referred to and by such reference made a part hereof. All Contract Documents are intended to cooperate so that any work called for in one and not mentioned in the other is to be executed the same as if mentioned in all Contract Documents. Contractor agrees to perform all of its promises, covenants, and conditions set forth in the Contract Documents, and to abide by and perform all terms and conditions set forth therein. In case of conflict between this Agreement and any other contract document, this Agreement shall take precedence.

Article 3. COVENANTS AND CONTRACT PRICE

The City hereby promises and agrees with the said Contractor to employ, and does hereby employ, the said Contractor to provide the material and to do the Work according to the terms and conditions of the Contract Documents herein contained and referred to, for the prices hereinafter set forth, and hereby contracts to pay the same at the time, in the manner and upon the conditions herein set forth; and the said parties for themselves, their heirs, executors, administrators, successors and assigns, do hereby agree to the full performance of the covenants herein contained. The City shall pay the Contractor for the completion of the Work in accordance with the Contract Documents in current funds the Contract Prices named in the Contractor's Bid and Bid Price Schedule, a copy of which is attached hereto as Exhibit "A".

Article 4. COMMENCEMENT AND COMPLETION

The Work to be performed under this Contract shall commence on the date specified in the Notice to Proceed by the City, and the Work shall be fully completed within the time specified in the Notice to Proceed pursuant to the Special Provisions.

The City and the Contractor recognize that time is of the essence of the Agreement and that the City will suffer financial loss if the Work is not completed within the time specified in the Special Provisions annexed hereto, plus any extensions thereof allowed in accordance with the Special Provisions. They also recognize the delays, expense, and difficulties involved with proving in a legal proceeding the actual loss suffered by the City if the Work is not completed on time. Accordingly, instead of requiring any such proof, the City and the Contractor agree that as liquidated damages for delay (but not as a penalty) the Contractor shall pay the City the sum of three thousand dollars (\$3,000.00) for each calendar day the Work remains uncompleted after the time specified herein for the completion of the Work.

Article 5. INDEMNITY

To the fullest extent of the law, the Contractor shall defend, indemnify, and hold the City and its employees, agents, and consultants harmless against and from any and all claims, suits, losses, damages, and liability for damages, including attorney's fees and other costs of defense brought for or on account of injuries to or death of any person, including but not limited to, workers and the public, or on account of injuries to or death of City employees, or damage to property, or any economic consequential or special damages which are claimed or which shall in any way arise out of or be connected with Contractor's services, operations or performance hereunder, regardless of the existence or degree of fault or negligence on the part of the City, the Contractor, subcontractors or employee of any of these, except the active, or sole, negligence of the City, its officers and employees, where expressly prescribed by statute.

The duty to indemnify and hold harmless the City specifically includes the duties to defend set forth in Section 2778 of the Civil Code. The insurance obligations of the Contractor are separate, independent obligations under the Contract Documents, and the provision of this defense and indemnity are not intended to modify nor should they be construed as modifying or in any way limiting, the insurance obligations set forth in the Contract Documents.

Article 6. GUARANTEES

Contractor shall repair or replace any or all work provided hereunder which is defective due to faulty materials, poor workmanship, or defective equipment at no expense to the City, ordinary wear or tear and unusual abuse or neglect excepted, during the term of the contract and for a period of one year from the date of final acceptance of the Work.

Contractor shall be required to repair or replace any and all adjacent facilities or areas which have been damaged or displaced due to contractor work performed under this Agreement at no expense to the City during the term of this Agreement and for a period of one year from the date of final acceptance of the Work.

The parties agree that this guarantee and the rights and obligations accruing therefrom shall be in addition to, and not by way of limitation in any manner whatsoever to, the rights, obligations, warranties or remedies otherwise provided for by law.

In the event of Contractor's failure to comply with the above mentioned conditions within ten (10) calendar days after being notified in writing by the City, Contractor hereby authorizes City to proceed to have said defects repaired and made good at Contractor's expense, and Contractor will honor and pay all costs and charges therefore upon written demand.

Article 7. DISPUTES RESOLUTION

- a. **CONTINUE WORK DURING DISPUTE:** In the event of any dispute between the City and the Contractor, the Contractor will not stop Work but will prosecute the work diligently to completion in the manner directed by the City, and the dispute shall be resolved by a court of law after completion of the Work. However, all disputes must be submitted by Contractor in accordance with subsequent provisions of this section.
- b. **CITY'S REVIEW OF CLAIM:** The City shall review the facts pertinent to the claim, secure assistance from legal and other advisors, coordinate with the contract administrators, and within the time stipulated in subsection "c" herein, render a written decision on the claim. A copy of the decision shall be furnished to the Contractor by certified mail, return receipt requested, or any other method that provides evidence of receipt. The decision of the City shall be made final and conclusive except as is otherwise provided herein.
- c. **REQUIREMENTS FOR FILING A CLAIM:** For any Claim Subject to this section, the following requirements apply: The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.
 1. For claims of less than fifty thousand dollars (\$50,000), the City shall respond in writing to any claim within 45 days of the receipt of the claim or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the City may have against the claimant. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the City and the claimant. The City's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after the receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.
 2. For claims of fifty thousand dollars (\$50,000) or more, but less than or equal to three hundred seventy-five thousand dollars (\$375,000), the City shall respond in writing to all written claims within 60 days of the receipt of the claim or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the City may have against the claimant. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the City and the claimant. The City's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after the receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.
 3. If the claimant disputes the City's written response, or the City fails to respond within the time prescribed, the claimant may so notify the City, in writing, either within 15 days of the City's response or within 15 days of the City's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for the settlement of

the issues in dispute. Upon a demand, the City shall schedule a meet and confer conference within 30 days for settlement of the dispute.

4. If following the meet and confer conference the claim or any portion remains in dispute, the claimant may 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. For the purpose of these provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits a written claim pursuant to subdivision (a) until the time the claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer conference.
- d. **CLAIMS EXEMPT FROM REVIEW:** The procedures and remedies provided in this Article 7 do not apply to:
 1. Any claims by the City.
 2. Any claims for or respecting personal injury or death or reimbursement or other compensation arising out of or resulting from liability for personal injury or death.
 3. Any claim or dispute relating to stop payment requests or stop notices.
 4. Any claim related to the approval, refusal to approve, or substitution of subcontractors, regardless of tier, and suppliers.
 - e. **PROCEDURE TO RESOLVE CIVIL CLAIMS:** The City and Contractor shall follow procedures established for all civil actions filed to resolve claims pursuant to Section 20104.4 of the Public Contract Code.
 - f. **PAYMENT OF UNDISPUTED PORTION OF CLAIM:** Payment by City of undisputed portion of claim; interest on arbitration award or judgment.
 1. City shall pay such portion of a claim which is undisputed except as otherwise provided in the Contract.
 2. In any suit filed under Section 20104.4, of the Public Contract Code, the City shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.
 - g. **SUIT IN EL DORADO COUNTY ONLY:** Any litigation arising out of this Contract shall be brought in El Dorado County and the Contractor hereby waives the removal provisions of California Code of Civil Procedure Section 394.

Article 8. ASSIGNMENT OF ANTITRUST ACTIONS

In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract the contractor or subcontractor offers and agrees to assign the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. 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 the contractor, without further acknowledgment by the parties.

If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under this chapter, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the

bid price, less the expenses incurred in obtaining that portion of the recovery. Upon demand in writing by the assignor, the assignee shall, within one year from such demand, reassign the cause of action assigned under this part if the assignor has been or may have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action."

Article 9. TERMINATION BY OWNER FOR CONVENIENCE

The City reserves the right to terminate the Contract at any time upon determination by the City's Representative that termination of the Contract is in the best interest of the City. City shall issue the Contractor a written notice specifying that the Contract is to be terminated.

Upon receipt of said written notice, Contractor shall stop all work under the Contract except: (1) work specifically directed to be completed prior to termination, (2) work the Inspector deems necessary to secure the project for termination, (3) removal of equipment and plant from the site of the Work, (4) action that is necessary to protect materials from damage, (5) disposal of materials not yet used in the Work as directed by the City, and (6) cleanup of the site.

If the Contract is terminated for the City's convenience as provided herein, all finished or unfinished work and materials previously paid for shall, at the option of City, become its property. Contractor shall be paid an amount which reflects costs incurred for work provided to the date of notification of termination. In addition, Contractor shall be paid the reasonable cost, as solely judged by City, and without profit, for all work performed to secure the project for termination.

Article 10. TERMINATION BY OWNER FOR CAUSE

If the Contractor is adjudged as bankrupt or insolvent, or makes a general assignment for the benefit of its creditors or if a trustee or receiver is appointed for the Contractor or for any of its property, or if Contractor files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or on more than one occasion fails to supply sufficient skilled workmen or suitable material or equipment, or on more than one occasion fails to make prompt payments to subcontractors for labor, materials, or equipment, or disregards the authority of the City's Representative, or the Engineer, if one is appointed, or otherwise violates any provision of the Contract Documents, then the City may, without prejudice to any other right or remedy and after giving the Contractor and its Surety a minimum of 10 days from delivery of a written termination notice, terminate the services of the Contractor and take equipment and machinery thereon owned by the Contractor and finish the Work by whatever method the City may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished.

Without prejudice to other rights or remedies the City may have, if the Contractor fails to begin delivery of materials and equipment, to commence Work within the time specified, to maintain the 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 ensure the City's interest, or, if the Contractor is not carrying out the intent of the Contract, an Inspector's written notice may be served upon the Contractor and the Surety on its faithful performance bond demanding satisfactory compliance with the Contract. If the Contractor or its Surety does not comply with such notice within 5 days after receiving it, or after starting to comply, fails to continue, the City may exclude it from the premises and take possession of all material and equipment, and complete the Work by City's own forces, by letting the unfinished Work to another Contractor, or by a combination of such methods.

Where the Contractor's services have been so terminated by the City, said termination shall not affect any right of the City against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the City due the Contractor will not release the Contractor from compliance with the Contract Documents.

If the unpaid balance of the Contract price exceeds the direct and indirect costs of completing the Work, including compensation for additional professional services, such excess shall be paid to the Contractor. If the sums under the Contract are insufficient for completion, the Contractor or Surety shall pay to the City within 5 days after the completion, all costs in excess of the Contract price. In any event, the cost of completing the Work shall be charged against the Contractor and its Surety and may be deducted from any money due or becoming due from the City.

If the Surety assumes any part of the Work, it shall take the Contractor's place in all respect for that part and shall be paid by the City for all Work performed by it in accordance with the Contract. If the Surety assumes the entire Contract, all money due the Contractor at the time of its default shall be payable to the Surety as the work progresses, subject to the terms of this Contract.

The provisions of the section shall be in addition to all other rights and remedies available to the City under law.

If after notice of termination, it is determined for any reason that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the notice of termination had not been issued. The Contract shall be equitably adjusted to compensate for such termination.

Article 11. WORKERS COMPENSATION CERTIFICATION

Contractor warrants and represents that he is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers compensation or to undertake self-insurance in accordance with the provisions of that Code. Pursuant to the provisions of California Civil Code sections 1860, 1861, and prior to commencement of work, the Contractor shall sign and file with the City Project Administrator a certification in the form prescribed in section 1861.

Article 12. WARRANTY

The Contractor warrants to the City that materials and equipment furnished for the Work will be good quality and new, unless otherwise required or permitted under the Contract Documents, that the Work will be free from defects or flaws and is of the highest quality of workmanship and that the Work will conform with the requirements herein. Work not conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective.

WAIVER AND RELEASE UPON FINAL PAYMENT

The undersigned has been paid in full, less retention, by the City for all labor, services, equipment and material furnished to the City on the _____ (name of Project) located at _____ and does hereby waive and release the City, its officers, agents, and employees, from all claims and liability to the Contractor arising out of, or in any way connected with, the Contract, except for the disputed contract claims specified below:

Notice of Disputed Claim Amount of Claim

\$ _____

Date

Name, Title

Name of Contractor

Article 13. RETAINAGE AND FINAL PAYMENT

The retention from payment is set forth in Section 8 "Measurement and Payment" of the Standard of the Special Provisions. The Contractor may elect to receive 100 percent of payments due as set forth in the Contract Documents, without retention, by depositing securities of equivalent value with the City, in accordance with, and as set forth in Section 22300 of the Public Contract Code.

Final Payment to the Contractor in accordance with the final estimate is contingent upon the Contractor furnishing the City with a signed written release of all claims against the City arising by virtue of the Contract. The Contractor, from the operation of the release, may specifically exclude disputed Contract claims in stated amounts. The release shall be in substantially the following form:

Article 14. AUTHORIZED SIGNATURES

The parties hereto represent that the undersigned individuals executing this Agreement on behalf of their respective parties are fully authorized to do so by law or other appropriate instrument and to bind upon said parties the obligations set forth herein.

IN WITNESS WHEREOF, the said Development Services Department of the City of Placerville, State of California, has caused this Agreement to be executed by the City Council of the City of Placerville, in its behalf, and the said Contractor has signed this Agreement the day and year written below.

CITY OF PLACERVILLE

Dated _____

City Manager, City of Placerville

CONTRACTOR

Dated _____

Name of Company

By _____
Authorized Representative License No. Federal Employer Identification No.

NOTE: If Contractor is a corporation, the legal name of the corporations shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if Contractor is a co-partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts in behalf of the co-partnership; and if Contractor is an individual, his/her signature shall be placed above. Contractor executing this document on behalf of a corporation or partnership shall be prepared to demonstrate by resolution, article, or otherwise that they are appropriately authorized to act in

these regards. For such corporation or partnership, such authority shall be demonstrated to the satisfaction of City. If signature is by an agent, other than officer of a corporation or a member of a partnership, an appropriate Power of Attorney shall be on file with the City prior to signing this document.

Mailing Address:

Business Address: _____

City, Zip: _____

Phone: _____ **Fax:** _____

ATTACHMENT: EXHIBIT "A", Contractors Bid and Bid Price Schedule

END OF CONTRACT

**INSERT EXHIBIT A
TO THE CONTRACT AGREEMENT
(ATTACH CONTRACTOR'S BID AND PLAN SCHEDULE)**

**CITY OF PLACERVILLE
COUNTY OF EL DORADO, STATE OF CALIFORNIA
ENGINEERING DEPARTMENT**

PAYMENT BOND

Bond No. _____

WHEREAS, the City of Placerville, Engineering Department, hereafter referred to as
"Obligee", has awarded to Contractor
_____ hereafter referred to as
"Principal" a contract for the work described as follows:

**Mosquito Road Stabilization Project – Phase 1
Project No.: 41819**

AND, WHEREAS, said Principal is required to furnish a bond in connection with said contract,
guaranteeing the faithful performance thereof: NOW, THEREFORE, we the undersigned
Principal and Surety are held and firmly bound unto the Obligee, in the sum of
_____ Dollars
(\$ _____) to be paid to the Obligee, for which payment we bind ourselves, jointly
and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH,

That is said Principal or its subcontractors shall pay any of the persons named in Civil
Code Section 3181, or amounts required to be deducted, Unemployment Insurance Code
with respect to work or labor performed by such claimant, or any amounts required to be
deducted, withheld, and paid over to the Franchise Tax Board from the wages of
employees or the Principal and his subcontractors pursuant to Section 18806 of the
Revenue and Taxation Code, with respect to such work and labor, that the surety herein
will pay for the same in an amount not exceeding the sum specified in this bond, otherwise
the above obligation shall be void. In case suit is brought upon this bond, the surety will
pay a reasonable attorney's fee to be fixed by the court.

This bond shall inure to the benefit of any of the persons named in Civil Code Section 3181
as to give right of action to such persons or their assigns in any suit brought upon this bond.

Dated: _____, 20____.

Correspondence or Claims relating to this bond should be sent to the Surety at the following
address:

PRINCIPAL

SURETY

ATTORNEY-IN-FACT

NOTE: Signatures of those executing for the surety must be properly acknowledged and a Power
of Attorney attached.

CERTIFICATE OF ACKNOWLEDGEMENT

State of California, County of _____.

On this _____ day of _____ in the year of _____, before me
_____, personally appeared
_____, personally known to be (or proved to me on
the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument
as the attorney in fact of _____, and
acknowledged to me that he subscribed the name of the said company thereto as surety, and his
own name as attorney-of-fact.

(SEAL)

Notary Public

**CITY OF PLACERVILLE
COUNTY OF EL DORADO, STATE OF CALIFORNIA
ENGINEERING DEPARTMENT**

PERFORMANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENT, that we,
the Contractor in the Contract hereto annexed, as Principal, and
_____ as Surety, are firmly bound unto the City of Placerville, a
Political Subdivision of the State of California, hereinafter called the "Obligee" in the sum of
_____ DOLLARS (\$_____) lawful
money of the United States, for which payment, well and truly to be made, we bind ourselves,
jointly and severally, firmly by these present.

Signed, sealed and dated:

The condition of the above obligation is that if said Principal as Contractor in the Contract hereto annexed shall faithfully perform each and all of the conditions of said Contract to be performed by him, and shall furnish all tools, equipment, apparatus, facilities, transportation, labor and material, other than material, if any, agreed to be furnished by the Obligee, necessary to perform and complete, and to perform and complete in a good and workmanlike manner, the work of **Mosquito Road Stabilization Project – Phase I - Project No. 41819** in strict conformity with the terms and conditions set forth in the Contract hereto annexed, then this obligation shall be null and void,; otherwise bond shall remain in full force and effect and the said Surety will complete the Contract work under its own supervision by Contract or otherwise, and pay all costs thereof for the balance due under terms of the Contract, and the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension or time, alteration of addition to the terms of the Contract or to the work.

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

This guarantee shall insure the Obligee during the work required by any Contract and for a period of one (1) year from the date of acceptance of the work against faulty of improper materials or workmanship that may be discovered during that time.

No right of action shall accrue under this bond to of for the use of any person other than the Obligee named herein.

Dated: _____, 20_____.

Correspondence or Claims relating to this bond should be sent to the Surety at the following address:

PRINCIPAL

SURETY

ATTORNEY-IN-FACT

NOTE: Signatures of those executing for the surety must be properly acknowledged and a Power of Attorney attached.

CERTIFICATE OF ACKNOWLEDGEMENT

State of California, County of _____.

On this _____ day of _____ in the year of _____, before me
_____, personally appeared
_____, personally known to be (or proved to me on
the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument
as the attorney in fact of _____, and
acknowledged to me that he subscribed the name of the said company thereto as surety, and his
own name as attorney-of-fact.

(SEAL)

Notary Public

*****END OF SECTION*****

**SECTION
00550
NOTICE TO
PROCEED**

Date: _____

To: _____ (Name of Contractor)

Address: _____

Project: Mosquito Road Stabilization Project – Phase 1

Project No.: 41819

You are notified that the counting of Contract Time under the above contract will commence to run on _____. On that date, you are to start performing your obligations under the Contract Documents. In accordance with Section 00800-

1.1, **Time Allowed for Completion**, the date of Substantial Completion _____.

Before you may start any Work at the Site, you must:

1. Submit certified Safety Program as required by California Code of Regulations, Title 8, General Industry Safety Orders and other related regulatory requirements.
2. Submit copies of applicable permits (Example: Cal OSHA Annual Trench Excavation Permit) Submit approved fire protection plan, if applicable
3. Attend Pre-Construction conference.

CITY OF PLACERVILLE

By: _____

Its: _____

Copy to Owner's Representative Construction Manager Engineer

*****END OF SECTION*****

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SECTION 00640

**CITY OF PLACERVILLE
3101 CENTER STREET
PLACERVILLE, CA 95667**

CERTIFICATION OF DRUG-FREE WORKPLACE

PROJECT: MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1

CONTRACT NO.: 41819

KNOW ALL PERSONS BY THESE PRESENTS: that _____

(Contractor) has reviewed and understands the Substance Abuse Policy of the City of Placerville and hereby expressly agrees, pursuant to and in furtherance of the City's policy, to maintain a Substance Abuse Policy at the site and take such necessary acts and/or measures to maintain a Drug-Free Workplace at the site. It is further agreed that the use, manufacture, distribution, dispensing or possession of illegal drugs by the Contractor or any person under the control of the Contractor (including, but not limited to subcontractors, their employees, mechanics and suppliers entering the City's premises) or while conducting business with the City of Placerville shall constitute a breach of contract between the City of Placerville and Contractor and shall give rise to any and all remedies available to the City of Placerville in the event of a breach of Contract, including the termination thereof.

SIGNED AND SEALED this ____ day of _____, 2019.

SEAL

Principal

Signature of Principal

Title of Signatory

*****END OF SECTION*****

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SECTION 00645

**CITY OF PLACERVILLE
3101 CENTER STREET
PLACERVILLE, CA 95667**

WORKERS' COMPENSATION INSURANCE CERTIFICATE

PROJECT: MOSQUITO ROAD STABILIZATION PROJECT – PHASE I

CONTRACT NO.: 41819

In accordance with California Labor Code Section 1861, prior to commencement of work on the Contract, the Contractor shall sign and file with the Owner the following certification:

"I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

Name of Contractor

Signature

Title of Signatory

Date (month/day/year)

*****END OF SECTION*****

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CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

SPECIAL PROVISIONS AND SUPPLEMENTARY CONDITIONS

OCTOBER, 2019

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**SECTION 00700
SPECIAL PROVISIONS**

SECTION A – DESCRIPTION OF PROJECT

The location and scope of work for this project are as described in the Technical Specifications.

1. Contract Documents: The work shall be done in accordance with the following documents which, by reference, are incorporated into the contract:
 - A. Notice to Contractors (Section 00020) As contained herein and published in periodicals of the local area.
 - B. Instructions to Bidders (Section 00100) As contained herein and used by bidder in preparing formal proposal to do work.
 - C. Proposal (Section 00310) Including the bond required therewith, all as contained in blank form herein, used by the bidder making formal proposal to do the work.
 - D. Contract (Section 00510) The formal agreement between the City of Placerville and the Contractor, including the Faithful Performance Bond, and the Payment (Labor and Materials) Bond.
 - E. Standards – Except as stated in the Technical Specifications all work and materials shall be in accordance with the El Dorado Irrigation District Design and Construction Standards current edition, El Dorado County Community Development Agency, Design and Improvement Standards Manual and Standard Construction Specifications, current editions, the City of Placerville Design and Improvement Standards Manual, current edition, and the Standard Specifications of the State of California, 2015 edition, which said documents are specifically referred to and by such reference made in part hereof.
 - F. Specifications for the Work – These specifications, including all references.
 - G. Document Precedence -- The component Contract documents are intended to provide explanation for each other. Any work shown on the Plans and not in the Specifications, or vice versa, is to be executed as if indicated in both. In case of a conflict in the Contract, the following order of precedence will govern interpretation of the Contract:
 - 1) Field Instruction or other written directives
 - 2) Addenda
 - 3) Technical Specifications

- 4) Special Provisions
- 5) Project Plans
- 6) City Design and Improvement Standards Manual
- 7) County and EID Standard Drawings
- 8) County and EID Standard Specifications
- 9) State Standard Drawings
- 10) State Standard Specifications

2. Changes in the Work

A. Form of Change:

- 1) The City may, at any time, by written order, make changes in the Work as deemed necessary by the Engineer. Such changes include, but are not limited to, changes:
 - a) In the Specifications or Plans;
 - b) In the sequence, method or manner of performance of the Work;
 - c) In the owner-furnished facilities, equipment, materials, services or site; or
 - d) Directing acceleration of the Work.
- 2) If such changes cause an increase or decrease in the Contractor's cost of, or time required for, performance of the Contract, an equitable adjustment will be made and the Contract modified in writing accordingly.
 - a) Change Orders. A change pursuant to this Section A-2B will be in the form of a Contract Change Order which will set forth the work to be done or the method by which the change and cost adjustment, if any, will be determined, and the time of completion of the work.

Upon receipt of a Contract Change Order, the Contractor shall proceed with the ordered work. If ordered in writing by the Engineer, the Contractor shall proceed with the work so ordered

prior to actual receipt of a Contract Change Order. A Contract Change Order executed by the Contractor and approved by the Engineer is an executed Contract Change Order as that term is used throughout this Section.

- b) Change Order Protests. A Contract Change Order may be issued to the Contractor at any time. Should the Contractor disagree with any terms or conditions set forth in a Contract Change Order which the Contractor has not executed, the Contractor shall submit a written protest to the Engineer within fifteen (15) calendar days after the receipt of such Contract Change Order. The protest shall state the points of disagreement and, if possible, the quantities and cost involved. If a written protest is not submitted, payment will be made as set forth in the Contract Change Order. Such payment shall constitute full compensation for all work included therein or required thereby. Such unprotested Contract Change Orders shall be considered as executed Contract Change Orders.

Where the protest concerning a Contract Change Order relates to compensation, the compensation payable for all work specified or required by the Contract Change Order to which such protest relates will be determined in the same manner as provided in Section A-2B. The Contractor shall keep full and complete records of the cost of such work and shall permit the Engineer to have such access thereto as may be necessary to assist in the determination of the compensation payable for such work. Where the protest concerning a Contract Change Order relates to the adjustment of time and the completion of the Work, the time to be allowed therefore will be determined as provided in this Section.

The consent of the Contractor's sureties shall not be required as to any change or Extra Work, and the liability of the Contractor's Bonds shall be increased or decreased accordingly without notice to the sureties.

B. Procedures and Allowable Costs on Changes and Additions to Work

1) Forms of Payment

If the change in, or addition to, the Work will result in an increase in the contract sum, the City shall have the right to require the performance thereof. The compensation to be paid for any such work shall, in the City's sole discretion, be determined in one or more of the following ways:

- a) By agreed unit prices, if unit prices are required by the City's bid form and provided with contractor's bid;
- b) By proposal and acceptance of an agreed upon lump sum; or
- c) On a time and materials basis.

Until one of the above methods is agreed on, or if the Work is to be paid for on a time and materials basis, the Contractor shall keep full and complete records of the cost of such work in the form and manner prescribed by the Engineer and shall permit the Engineer to have access to such records as may be necessary to assist in the determination of the compensation payable for such work.

2) Lump Sum Payment

The City, in its sole and absolute discretion, may request a lump sum proposal by Contractor to perform the change in, or addition to, the Work performed. Such lump sum proposal shall be submitted by the Contractor within ten (10) days of the City's request therefor. Request for a lump sum proposal by City shall not be deemed an election by City to have the Work performed on a lump sum basis. Costs of preparing the proposal shall not be compensable.

- a) Contents of Lump Sum Proposal. The Contractor's proposal shall be itemized and segregated by labor and materials for the various components of the change (no aggregate labor total will be acceptable). The proposal shall be accompanied by signed proposals of any Subcontractors which will perform any portion of the change, and of any persons who will furnish materials or equipment for incorporation therein. The proposal shall also include the Contractor's estimate of the time required to perform the changes or additional work.
- b) Computation of Labor Costs. The portion of the proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, may include the projected wages of the reasonably anticipated Site labor, including foremen, who will be directly involved in the change in the Work. These projected wages shall not include charges for assistant superintendents, superintendents, office personnel, timekeepers and maintenance mechanics.

Labor costs may also include Contractor's overhead and profit which shall be computed by adding to the labor costs either up to fifteen percent (15%) of the projected wages, but not payroll costs, or the labor surcharge set forth in the California Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the Work is accomplished and which is a part of the Contract. The method of computing the overhead and profit shall be solely within the discretion of the City.

The labor surcharge, if used, 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 worker, other than actual wages as defined above or travel and subsistence payments as provided by Labor Code Section 1773.8. No time or charges will be allowed except when the workers are actually engaged in the proper, efficient and diligent performance or completion of the extra work as authorized. Overtime shall not be worked without prior approval of the Engineer.

- c) Computation of Equipment and Materials Costs. The portion of the proposal relating to materials may include the reasonably anticipated direct costs to the Contractor or to any of its Subcontractors of materials to be purchased for incorporation in the change in the Work. This portion of the proposal may also include transportation and applicable sales or use taxes. Up to fifteen percent (15%) of these direct costs may be included as overhead and profit for the Contractor or any such Subcontractor (such overhead and profit to include all small tools).

This portion of the proposal may further include the Contractor's and any of its Subcontractors' reasonably anticipated costs for the rental and operation of prime construction and automotive equipment furnished and used in connection with the change in the Work. The equipment rental and operation rates used shall be the current edition of the Department of Transportation, Division of Construction, Equipment Rental Rates. These costs shall not include charges for listed equipment or major tools with a new cost of \$500.00 or less. No time charges shall be allowed except for equipment actually used for the proper and efficient performance or completion of the authorized change in the Work.

- d) Subcontractors. The lump sum proposal may include up to five percent (5%) of the amount which the Contractor will pay to any of

its Subcontractors for the change in the Work as allowable overhead and profit to the Contractor.

- e) Failure to Submit Lump Sum Proposal. In the event that the Contractor fails to submit its proposal within the designated period, the Engineer may direct the Contractor to proceed with the change or addition to the Work and the Contractor shall so proceed. The Engineer shall unilaterally determine the reasonable costs and time to perform the work in question, which determination shall be final and binding upon the Contractor.
- f) Failure to Agree on Lump Sum Amount. In the event that the parties are unable to agree as to the reasonable costs and time to perform the change in or addition to the Work based upon the Contractor's proposal and the Engineer and City do not elect to have the change in the Work performed on a time and material basis, the Engineer and City shall make a unilateral determination of the reasonable cost and time to perform the change in the Work, based upon their own estimates, the Contractor's submission or combination thereof. In such instances, a Change Order shall be issued for the amount of costs and time determined by the Engineer and the City and shall become binding upon the Contractor unless the Contractor submits its protest in writing to the City within thirty (30) days of the issuance of the Change Order.

The City has the right to direct the Contractor in writing to perform the change in the Work which is the subject of the Change Order.

Failure of the parties to reach agreement regarding the costs and time of the performing the change in the Work and/or any pending protest shall not relieve the Contractor from performing the change in the Work promptly and expeditiously.

3) Payment by Unit Prices

If any of the items included in the lump sum proposal are covered by unit prices contained in the contract document, the City may, if it requires the change in the Work to be performed on a lump sum basis, elect to use these unit prices in lieu of the similar items included in the lump sum proposal in which event an appropriate deduction will be made in the lump sum amount prior to the application of any allowed overhead and profit percentages. No overhead and profit shall be applied to any unit prices.

4) Payment on a Time and Material Basis

If the City elects to have the change or addition to the Work performed on a time and material basis, the Work shall be performed, whether by the Contractor's forces or the forces of any of its Subcontractors or Sub-subcontractors, at actual costs to the entity or entities performing the change in the Work. Actual costs shall not include any charge for administration, clerical expense, supervision or superintendence of any nature whatsoever, including foremen, or the costs, use or rental of tools or plant.

Contractor may add fifteen percent (15%) thereof as the total overhead and profit to the entity or entities actually performing the change. This fifteen percent (15%), however, shall not be applied against any payroll costs as defined in Section A-2B with respect to lump sum proposals. If the entity or entities actually performing the work are Subcontractors or Sub-subcontractors, the Contractor shall be allowed five percent (5%) of the total charge of the performing entity or entities (including mark-up) as Contractor's mark-up. No other mark-ups shall be allowed hereunder.

The Contractor shall submit to the City daily work and material tickets, to include the identification number assigned to the change in the Work, the location and description of the change in the Work, the classification of labor employed (and names and social security numbers), the material used, the equipment rented (not tools) and such other evidence of cost as the City may require. The City may require authentication of all time and material tickets and invoices by persons designated by the City for such purpose. The failure of the Contractor to secure any required authentication shall, if the City elects to treat it as such, constitute a waiver by the Contractor of any claim for the cost of that portion of the Change in the Work covered by a non-authenticated ticket or invoice; provided, however, that the authentication of any such ticket or invoice by the City shall not constitute an acknowledgment by the City that the items thereon were reasonably required for the Change in the Work.

5) Limitations on Changes

The Contractor shall not be entitled to any amount for indirect costs, damages or expenses of any nature, including, but not limited to, so-called "impact" costs, labor inefficiency, wage, material or other escalations beyond the prices upon which the proposal is based and to which the parties have agreed pursuant to the provisions of this Section, and which the Contractor, its Subcontractors and Sub-subcontractors or any other person may incur as a result of delays, interferences,

suspensions, changes in sequence or the like, for whatever cause, whether reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable, arising from the performance of any and all changes in the work performed pursuant to this Section. It is understood and agreed that the Contractor's sole and exclusive remedy in such event shall be recovery of its direct costs as compensable hereunder and an extension of the time of the Contract, but only in accordance with the provisions of the Contract Documents.

It is expressly agreed that Contractor shall not be entitled to claim damages for anticipated profits on any portion of the Work that may be deleted. The amount of any adjustment for work deleted shall be estimated at the time deletion of work is ordered and the estimated adjustment will be deducted for the subsequent monthly pay estimates. The City reserves its rights under Section A-2H to audit Contractor's as-bid profit in connection with any deductive change, to arrive at a final adjustment. Contractor's as-bid profit shall be reduced pro rata according to the proportion of the original contract value less as-bid profit, represented by the work deleted.

The City reserves the right to contract with any person or firm other than the Contractor for any or all Extra Work.

- C. Unilateral Change in or Addition to the Work. Notwithstanding the above, the City, directly or through the Engineer, may direct the Contractor in writing to perform changes in or additions to the scope of the Contract. The Contractor shall perform such work and the parties shall proceed pursuant to the provisions of Section A-2B.
- D. Changes in Character of Work. If an ordered change in the Plans or Specifications materially changes the character of the Work of a Contract item from that upon which the Contractor based its bid price, and if the change increases or decreases the actual unit costs of such changed item as compared to the actual or estimated unit cost of performing the Work of the item in accordance with the Specifications and Plans originally applicable thereto, in the absence of an executed Contract Change Order specifying the compensation payable, an adjustment in compensation therefor will be made in accordance with the following:
 - 1) The basis of such adjustment in compensation will be the difference between the Contract unit-price to perform the work of the item or portion thereof involved in the change as originally planned and the actual unit cost of performing the work of the item or portion thereof involved in the change, as changed. Actual unit costs will be as agreed upon by the

Contractor and the Engineer. If they cannot agree or if there is no unit-price for the subject work, then the costs of the work will be determined by the Engineer in the same manner as if the work were to be paid for on the time and material basis as provided in Section A-2B. Any such adjustment will apply only to the portion of the work of the item actually changed in character.

- 2) Failure of the Engineer to recognize the change in character of the work at the time the Contract Change Order is issued shall in no way be construed as relieving the Contractor of its duties and responsibility of filing a written protest within the fifteen (15) calendar day limit as herein above provided.

E. Differing Site Conditions. The Contractor shall promptly, and before the following conditions are disturbed, notify the City in writing of any:

- 1) Material that the Contractor believes may contain hazardous waste, as defined in Section 25118 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; or
- 2) Subsurface or latent physical conditions at the Site differing from those indicated in the Contract Documents; or
- 3) Unknown conditions at the Site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

The Engineer shall thereupon promptly investigate the conditions. If the Engineer finds that they do involve hazardous waste, or do materially differ and cause and decrease or increase in the Contractor's cost of time of performance, the Engineer will issue and change order as appropriate. Any increase or decrease of cost resulting from such changes shall be adjusted in the manner provided in Section A-2B for adjustments as to extra and/or additional work and changes. However, neither the City nor the Engineer shall be liable or responsible for additional work, costs or changes to the Work due to material difference between actual conditions and any geotechnical, soils and other reports, surveys and analyses made available for the Contractor's review. In the event that a dispute arises between the City and the Contractor, whether the conditions materially differ, or involve hazardous waste, or cause and decrease or increase the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided by the Contract, but shall proceed with all work

to be performed under the Contract, the procedures applicable to claims for extra costs shall then apply.

F. Civil Action Procedures

The following procedures shall apply to all civil actions filed to resolve claims under this contract.

1) Non-Binding Mediation

Within sixty (60) days, but no earlier than thirty (30) days, following the filing of responsive pleadings, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties. 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 or by stipulation of both parties. If the parties fail to select a mediator within the fifteen-(15) day period, any party may petition the court to appoint the mediator.

2) Judicial Arbitration

- 1) 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 1141.11 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 subsection consistent with the rules pertaining to judicial arbitration.
- 2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators shall be experienced in construction law. Upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

- 3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of part 3 of the Code of Civil Procedure, 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 of the other party arising out of the appeal.

3) Intent

- 1) It is the intention of this Section that the differences between the parties, arising under and by virtue of the Contract, be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that it shall have no right to additional compensation for any claim that may be based on any act, failure to act, event, thing or occurrence for which no written notice of potential claim, as herein required, was timely filed.
- 2) In the event of an emergency endangering life or property, the Contractor shall act as stated in Section B-3E herein, and after execution of the emergency work shall present an accounting of labor, materials and equipment in connection therewith. The procedure for any payment that may be due to for emergency work will be as specified in Section A-2 herein.
- 3) The City shall pay money as to any portion of a claim which is undisputed, except as otherwise provided in the contract.
- 4) In any suit filed under this section, the City shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

G. Claims for Extra Costs

1) Notice of Potential Claims

- a) It is hereby mutually agreed that the Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the Engineer, or the happening of any event, thing or occurrence, unless the Contractor provides the Engineer with written notice of the potential claims as hereinafter specified. Compliance with this

section, however, shall not be a prerequisite as to matters within the scope of the protest provisions in Section A-2A.

- b) The written notice of potential claims shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. The notice as above required shall be given to the Engineer prior to the time that the Contractor commences performance of the Work giving rise to the potential claim for additional compensation, if based on an act or failure to act by the Engineer, or in all other cases within ten (10) days after the happening of the event, thing or occurrence giving rise to the potential claim.

2) Construction Claims

- a) The Contractor may submit a claim to the Engineer concerning any matter for which a protest under Section A-2A, or a notice of potential claim, is filed. Such claims, or potential claims, shall be submitted to the Engineer within ten (10) calendar days following the submission of the protest or notice, unless, due to the nature of the claim or the uncompleted state of the Work, it is impracticable to determine the amount or the extent of the claim within such period. In such cases, claims shall be submitted at the earliest practicable time in which such a determination can be made. In any event, all claims shall be filed on or before the date of the final release by the Contractor as provided for in Section B-8I. The contractor waives his rights to submit a claim if the notice of potential claims process or protest process is not followed per their respective sections
- b) All claims shall be in writing and shall set forth clearly and in detail, for each item of additional compensation claimed, the reasons for the claim, reference to applicable provisions of the Specifications, the nature and the amount of the cost involved, the computations used in determining such costs, all pertinent factual data and all the documents necessary to substantiate the claim. The Contractor shall maintain complete and accurate records of the cost or any portion of the Work for which additional compensation is claimed, and shall provide the Engineer with copies thereof, as required.

- c) The contractor waives his rights to submit a claim if the notice of potential claims process or protest process is not followed per their respective sections.

3) Resolution of Construction Claims \$50,000 or Less

- a) The City will respond in writing to all written claims for less than or equal to fifty thousand dollars (\$50,000) within forty-five (45) days of receipt of the claim, or may request, in writing, within thirty (30) days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the City may have against the claimant.
- b) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the City and the claimant.
- c) The City's written response to the claim, as further documented, shall be submitted to the claimant within fifteen (15) days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.

4) Resolution of Claims Greater than fifty thousand dollars (\$50,000) and Less than or Equal to three hundred and seventy-five thousand dollars (\$375,000).

- a) The City will respond in writing to all written claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000) within forty-five (45) days of receipt of the claim, or may request, in writing, within thirty (30) days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the City may have against the claimant.
- b) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the City and the claimant.
- c) The City's written response to the claim as further documented, shall be submitted to the claimant within thirty (30) days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

5) Resolution of Claims Greater than three hundred and seventy-five thousand dollars (\$375,000).

The Engineer shall, within a reasonable time after the presentation of any claim in excess of three hundred and seventy-five thousand dollars (\$375,000), make a decision in writing on such claim.

All decisions of the Engineer shall be final unless the Contractor, within ten (10) days after receipt of the Engineer's decision, files a written protest with the Engineer stating clearly and in detail the basis of the protest.

Such protest shall be forwarded promptly by the Engineer to the City Council, who will issue a decision on such protest. It is hereby agreed that the Contractor's failure to protest the Engineer's determination or instruction within ten (10) days after such determination or instruction is transmitted to the Contractor shall constitute a waiver by the Contractor of all rights to further protest, judicial or otherwise.

6) Meet and Confer Conference

- a) If the claimant disputes the City's written response, or the City fails to respond within the time prescribed, the claimant may so notify the City, in writing, either within fifteen (15) days of receipt of the City's response or within fifteen (15) days of the City's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the City will schedule a meet and confer conference within thirty (30) days for settlement of the dispute.
- b) If, following the meet and confer conference, the claim or any portion thereof remains in dispute, the claimant may 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. 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 claimant submits its written claim pursuant to subdivision (1) until the time the claim is denied, including any period of time utilized by the meet and confer conference.

7) Contractor's Duty During Claim Resolution

The Contractor shall proceed with the Work in accordance with the plans and specifications and determinations and instructions of the Engineer during the resolution of any claims disputes.

H. City's Right to Audit and Preservation of Records

- 1) The Contractor shall maintain books, records and accounts of all costs in accordance with generally accepted accounting principles and practices. The City and its authorized representatives shall have the right to audit the books, records and accounts of the Contractor under any of the following conditions:
 - a) The Contract is terminated for any reason in accordance with the provisions of the Contract Documents in order to arrive at equitable termination costs;
 - b) In the event of a disagreement between the Contractor and the City over the amount due the Contractor under the terms of the Contract;
 - c) To check or substantiate any amounts invoiced or paid which are required to reflect the costs of the Contractor, or the Contractor's efficiency or effectiveness under this Contract or in connection with extras, changes, claims, additions, backcharges, or others, as may be provided for in this Contract; and/or
 - d) If it becomes necessary to determine the City's rights and the Contractor's obligations under the Contract or to ascertain facts relative to any claim against the Contractor which may result in a charge against the City;
 - e) To determine any difference in cost occasioned by a permissible substitution; and /or
 - f) For any other reason in the City's sole judgment.
- 2) Contractor shall provide the City (or its representatives), unlimited, reasonable access during working hours to the Contractor's books and records. The City's audit rights shall be liberally construed in the City's favor.
- 3) The Contractor, from the effective date of final payment or termination hereunder, shall preserve and make available to the City for a period of three (3) years thereafter, at all reasonable times at the office of the

Contractor (but without any charge to the City), all its books, records, documents, photographs, micro- photographs, and other evidence bearing on the costs and expenses of the Contractor under this Contract and relating to the Work hereunder.

- 4) The City will make all payments required of it under this Contract subject to audit, under circumstances stated above, which audit may be performed at the City's option, either during the Contract time period or during the record retention time period. Regardless of authorization, approval or acceptance, signatures or letters which are given by the City and are part of the City's control systems or are requested by the Contractor, the payments made under this Contract shall not constitute a waiver or agreement by the City that it accepts as correct the billings, invoices or other charges on which the payments are based. If the City's audit produces a claim against the Contractor, the City may pursue all its legal remedies even though it has made all or part of the payments required by this Contract.
- 5) If any audit by the City or its representative discloses an underpayment by the City pursuant to the terms of the Contract Documents, the City shall have the duty to pay any amount found by the audit to be owed to the Contractor. If such audit discloses an overpayment, the Contractor shall have the obligation to reimburse the City for the amount of the overpayment. The City's right to claim reimbursement from the Contractor of any overpayment shall not be terminated or waived until three years after the completion of the City's audit or upon the termination of audit rights under subparagraph (f), below, whichever date is later. The obligation of the Contractor to make reimbursements hereunder shall not terminate except as provided by law.
- 6) The City's right to audit and the preservation of records shall terminate at the end of three (3) years after the date final payment is made or termination of the Contract. The Contractor shall include this "Right to Audit and Preservation of Records" clause in all subcontracts issued by it and it shall require the same to be inserted by all Sub-subcontractors in their subcontracts, for any portion of the work. Should Contractor fail to include this clause in any such contract or Sub- subcontractor contract, or otherwise fail to insure the City's rights hereunder, Contractor shall be liable to the City for all costs, expenses and attorney's fees which the City may have to incur obtaining or attempting to obtain an audit or inspection of or the restoration of records which otherwise would have been available to the City from the persons under this clause. The City or its authorized representative may conduct such audit.

3. Equal Employment Opportunity. During the performance of this contract, the Contractor agrees as follows:

That the Contractor will not, because of race, religious creed, color, sex, national origin or ancestry of any person, refuse to hire or employ any applicant or to bar or discharge any employee from employment, or to discriminate against any employee in compensation, or in terms, conditions or privileges of employment and that the Contractor will take affirmative action to insure that every applicant for employment and every employer will receive equal opportunity for employment and shall be granted equal treatment with respect to compensation, terms, conditions or other privileges of employment, without regard to any employee's race, religious creed, color, sex, national origin or ancestry.

SECTION B – GENERAL REQUIREMENTS

1. Definitions and Terms

- A. Standard Specifications – The Standard Specifications of the State of California, Department of Transportation, Division of Highways, 2015 edition. Any reference therein to a State Agency or officer shall be interpreted as the corresponding City office or officer acting under this contract with address at City Hall, Placerville, California 95667.
- B. City – The City of Placerville.
- C. City Council – The governing body of the City.
- D. City Specifications – The El Dorado Irrigation District, Design and Construction Standards, current edition. Any reference therein to a County Agency or officer shall be interpreted as the corresponding City office or officer acting under this contract with address at City Hall, Placerville, California 95667.
- E. Engineer – City Engineer of the City of Placerville or authorized agent who shall represent the City during the term of the contract.
- F. Laboratory – The laboratory of the City of Placerville to the extent of its capability; otherwise as defined in the Standard Specifications.

2. Proposal Requirements and Conditions

- A. General – The bidder's attention is directed to the provisions of Section 2 of the Standard Specifications, as supplemented herein, for the requirements and conditions which he/she must observe in the preparation of the proposal form and the submission of the bid.

- B. Proposal Forms – The proposal forms are bound in these Specifications which may be obtained from the office of the City of Placerville Engineering Division City Hall, 3101 Center Street, Placerville, California, as advertised in the 'Notice to Bidders.
 - C. Disqualification of Bidders – In addition to the other requirements the bidder must declare in the proposal that he/she has not accepted any bid from any Subcontractor or vendor through any bid depository, By-Laws, Rules and Regulations of which prohibit or prevent the Contractor from considering any bid from any Subcontractor or vendor which is not processed through said bid depository or which prevent any Subcontractor or vendor from bidding to any Contractor who does not use the facilities of or accept bids from or through such bid depository as to their ability, financial responsibility and experience in order to be eligible for consideration of their proposal.
 - D. Non-Collusion – In accordance with Public Contract Code Section 7106, a Non-collusion Affidavit is included in the proposal. Signing the proposal shall also constitute signature of the Non-collusion Affidavit.
3. Award and Execution of Contract, and Insurance Requirements
- A. General – The bidder's attention is directed to the provisions of Section 3 of the Standard Specifications, as supplemented herein, for the requirements of the Contract.
 - B. Award of Contract
 - 1) The City reserves the right to accept or reject any and all Bids for a period of one hundred and twenty (120) days after the date of opening, and to waive any minor informality or irregularity in any Bid. No Bid can be withdrawn during that period.
 - 2) The City reserves the right to reject any or all Bids, including, without limitation, the right to reject any non-conforming, non-responsive, unbalanced, or conditional bids.
 - C. Contract Bonds

The successful bidder shall furnish with the Contract a FAITHFUL PERFORMANCE BOND and a PAYMENT (LABOR AND MATERIALS) BOND, each in the amount of 100% of the total bid, on the forms prescribed by the City.
 - D. Responsibility of Contractor, Hold Harmless & Indemnity Agreement

The contractor shall take all responsibility for the work and shall defend, indemnify, release and hold harmless the City, its officers, officials, employees, agents and volunteers, from all claims, loss, damage, injury, and liability of every kind, nature, and description, directly or indirectly arising from the performance of the contract of work regardless of responsibility for negligence (including costs and expenses, which include attorney's fees, incurred in connection therewith) and from any and all claims, loss, damage, injury, and liability, howsoever the same may be caused, resulting directly or indirectly from the nature of the work covered by the contract, regardless of responsibility for negligence (including costs and expenses, which include attorney's fees, incurred in connection therewith), but excluding liability due to the sole negligence or willful misconduct of the City.

The City, pursuant to this contract and indemnity agreement, may, at the time of preparing and certifying the final voucher, and as a condition of preparing and certifying the same, require the Contractor to continue his/her bond or any part thereof, as security against any such unsatisfied claims, for a time not exceeding the time when such claims would be legally barred. Approval of the insurance under this hold harmless and responsibility clause.

E. Insurance and Liability

1) Insurance

Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the Contractor, its agents, representatives, employees or Subcontractors. The cost of such insurance shall be included in the Contractor's bid.

- a) Neither the Contractor nor any Subcontractor shall commence any work until all required insurance has been obtained at their own expense. Such insurance must have the approval of the City as to limit, form, and amount, and shall be placed with insurers with a current A.M. Best's rating of no less than A:VII.
- b) Any insurance bearing on adequacy of performance shall be maintained after completion of the Project for the full guarantee period.
- c) Prior to execution of the Contract, the Contractor shall furnish the City with original endorsements effecting coverage for all policies required by the Contract. The Contractor shall not permit any

Subcontractor identified in the Designation of Subcontractors form to commence work on this Project until such Subcontractor has furnished the City with original endorsements effecting coverage for all insurance policies required by the Contract. The endorsements are to be on forms provided or approved by the City. The City may require the Contractor or any Subcontractor to furnish complete certified copies for all insurance policies affecting the coverage required by the Contract.

- d) All of the Contractor's policies shall contain an endorsement providing that written notice shall be given to the City at least sixty (60) calendar days prior to termination, cancellation, or reduction of coverage in the policy.
- e) Any policy or policies of insurance that the Contractor elects to carry as insurance against loss or damage to its construction equipment and tools shall include a provision therein providing a waiver of the insurer's right to subrogation against the City or its officers.
- f) The requirements as to the types, limits, and the City's approval of insurance coverage to be maintained by the Contractor are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under the Contract.
- g) In addition to any other remedy the City may have, if the Contractor or any of the Subcontractors fail to maintain the insurance coverage as required in this Section, the City may obtain such insurance coverage as is not being maintained, in form and amount substantially the same as required herein, and the City may deduct the cost of such insurance from any amounts due or which may become due the Contractor under this Contract.
- h) The Contractor and all Subcontractors shall, at their expense, maintain in effect at all times during the performance of work under the Contract not less than the following coverage and limits of insurance, which shall be maintained with insurers and under forms of policy satisfactory to the City. The maintenance by the Contractor and all Subcontractors of the following coverage and limits of insurance is a material element of this Contract. The failure of the Contractor or any Subcontractor to maintain or renew coverage or to provide evidence of renewal may be treated by the City as a material breach of this contract.

I. Worker's Compensation and Employer's Liability Insurance

a) Worker Compensation

The Contractor and all Subcontractors shall maintain insurance to protect the Contractor or Subcontractor from all claims under Worker's Compensation and Employer's Liability Acts, including Longshoremen's and harbor Workers' Act. Such coverage shall be maintained, in type and amount, in strict compliance with all applicable State and Federal statutes and regulations. The Contractor shall execute a certificate in compliance with Labor Code Section 1861, on the form provided in the Contract Documents.

b) Claims Against City

If an injury occurs to any employee of the Contractor or any of the Subcontractors for which the employee or its dependents, in the event of its death, may be entitled to compensation from the City under the provisions of the Acts, or for which compensation is claimed from the City, there will be retained out of the sums due the Contractor under this Contract, an amount sufficient to cover such compensation as fixed by the Acts, until such compensation is paid or it is determined that no compensation is due. If the City is required to pay such compensation, the amount so paid will be deducted and retained from such sums due, or to become due, the Contractor.

II. Commercial General and Automobile Liability Insurance

The Contractor shall maintain in effect at all times during the performance of the work hereunder not less than the following coverages and limits of Commercial General and Automobile Liability insurance:

I. Form and Amount

The insurance shall include, but shall not be limited to, protection against claims arising from death, bodily injury, personal injury, or damage to property resulting from actions, failures to act, operations or equipment of the insured, or by its employees, agents or consultants, or by anyone directly or indirectly employed by the insured. The amount of insurance coverages shall not be less than the limits stated in the Appendix section of this document. Any deductibles must be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles as respects the entity, its officers, officials,

employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration expenses, and defense expenses.

The commercial general and automobile liability insurance coverage shall also include the following:

II. Additional Requirements

- i. Provisions or endorsement naming the City, the Engineer and the City's consultants, and each of their officers, employees, and agents, as additional insureds with respect to any potential liability arising out of the performance of any work under the Contract, and providing that such insurance is primary insurance as respects the interest of the City and the Engineer, and its consultants, and each of their officers, employees, and agents and that any other insurance, risk pool membership, or other liability protection maintained by the City or maintained by the Engineer is excess to the insurance required hereunder, and will not be called upon to contribute to any loss.
- ii. "Cross Liability" or "Severability of Interest" clause.
- iii. Broad Form Property Damage, Personal Injury, Contractual Liability, Protective Liability, and Completed Operations coverages, and elimination of any exclusion regarding loss or damage to property caused by explosion or resulting from collapse of buildings or structures or damage to property underground, commonly referred to by insurers as the "XCU" hazards.
- iv. Provision or endorsement stating that such insurance, subject to all of its other terms and conditions, applies to the liability assumed by the Contractor under the Contract, including, without limitation, that set forth in Section B-3E(2), Indemnity and Litigation Costs.
- v. Provisions or endorsement stating that any failure to comply with reporting or other provisions of the policies, including breaches of warranties, shall not affect coverage provided to the City, its officers, officials, employees, or volunteers.

- vi. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

III. Builder's Risk or Installation Floater "All-Risk" Insurance

If required, before commencement of the Work, the Contractor shall submit written evidence that it has obtained for the period of the Contract, Builder's Risk "All-Risk" Completed Value Insurance and/or Inland Marine "All-Risk" Installation Floater Insurance, as may be applicable, upon the entire Project which is the subject of this Contract, including completed work and work in progress. The policy or policies of insurance shall name the Contractor, City, and Engineer as insured as their respective interests may appear, and shall include an insurer's waiver of subrogation rights in favor of each. Such insurance may have a deductible clause, but the amount of the deductible shall be subject to the approval of the City, except that the deductible on earthquake coverage may be in accordance with the underwriter's requirements.

2) Indemnity and Litigation Cost

- a) Promptly upon execution of the Contract, the Contractor specifically obligates itself and hereby agrees to protect, hold free and harmless, defend and indemnify the City, the Engineer and its consultants, and each of their officers, employees and agents, from any and all liability, penalties, costs, losses, damages, expenses, causes of action, claims or judgments, including attorney's fees, which arise out of or are in any way connected with the Contractor's, or its Subcontractors' or suppliers', performance of work under this Contract or failure to comply with any of the obligations contained in the Contract. This indemnity shall imply no reciprocal right of the Contractor in any action on the contract pursuant to California Civil Code section 1717 or section 1717.5. To the fullest extent legally permissible, this indemnity, defense and hold harmless agreement by the Contractor shall apply to any and all acts or omissions, whether active or passive, on the part of the Contractor or its agents, employees, representatives, or Subcontractor's agents, employees and representatives, resulting in claim or liability, irrespective of whether or not any acts or omissions of the parties to be indemnified hereunder may also have been a contributing factor to the liability, except such loss or damage which was caused by the active negligence, the sole negligence, or the willful misconduct of the City.

- b) In any and all claims against the City, the Engineer and each of their consultants, officers, employees and agents by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this Section shall not be limited in way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under Workers' Compensation statutes, disability benefit statutes or other employee benefit statutes.
- c) This indemnity shall not apply to fees and costs incurred by the City in prosecuting or defending against the Contractor in any proceeding under Sections A-2F and A-2G of these Special Provisions.

3) Protection of Work

- a) The Contractor shall be responsible for the care of all the Work until its completion and final acceptance. The Contractor shall, at its own expense, replace damaged or lost material and repair damaged parts of the Work or the City may do the same at the Contractor's expense and the Contractor and its sureties shall be liable there for. The Contractor shall make its own provisions for properly storing and protecting all material and equipment against theft, injury, or damage from any and all causes. Damaged material and equipment shall not be used in the Work. The Contractor shall take all risks from floods and casualties except as provided by law, and shall make no charge for the restoration of such portions of the work as may be destroyed or damaged by flood or other casualties or because of danger from flood or other casualties or for delays from such causes. The Contractor may, however, be allowed a reasonable extension of time on account of such delays, subject to the conditions herein before specified. The Contractor shall not be responsible for the cost, in excess of five percent (5%) of the contracted amount, of repairing or restoring damage to the Work, if the damage was proximately caused by an earthquake in excess of a magnitude of 3.5 on the Richter Scale or by tidal waves; provided that the Work damaged was built in accordance with accepted and applicable building standards, and the plans and specifications of the City.
- b) The Contractor shall effectively secure and protect adjacent property and structures, livestock, crops and other vegetation. If

applicable, the Contractor shall open fences on or crossing the right-of-way and install temporary gates of sound construction thereon so as to prevent the escape of livestock. Adjacent fence posts shall be adequately braced to prevent the sagging or slackening of the wire. Before such fences are opened, the Contractor shall notify the owner or tenant of the property and, where practicable, the opening of the fence shall be in accordance with the wishes of the owner or tenant. The Contractor shall be responsible that no loss or inconvenience shall accrue to the owner or tenant by virtue of their fences having been opened or the gate not having been either shut or attended at all times. Where special types of fences are encountered, the Contractor shall install temporary gates made of similar materials and of suitable quality to serve the purposes of the original fences. In all cases where the Contractor removes fences to obtain workroom, the Contractor shall provide and install temporary fencing as required, and on completion of construction shall restore the original fence to the satisfaction of the Engineer. All costs of providing, maintaining and restoring gates and fencing shall be borne by the Contractor. The Contractor shall provide and maintain all passageways, guard fences, lights and other facilities for protection required by public authority or local conditions.

- c) The Contractor shall use extreme care during construction to prevent damage from dust to crops and adjacent property. The Contractor, at its own expense, shall provide adequate dust control for the right-of-way and take other preventative measures as directed by the Engineer.
- d) The Contractor shall be responsible for all damage to any property resulting from trespass by the Contractor or its employees in the course of their employment, whether such trespass was committed with or without the consent or knowledge of the Contractor.
- e) The Contractor shall see that the Site is kept drained and free of all ground water and any other water which may impede the progress or execution of the Work.
- f) The Contractor shall be responsible for any damage caused by drainage or water runoff from construction areas and from construction plant areas.

- g) In an emergency affecting the safety of life, the Work, or adjoining property, the Contractor, without special instruction or authorization from the Engineer, is hereby permitted to act at its discretion to prevent such threatened loss or injury, and the Contractor shall so act without appeal if so instructed or authorized. Any compensation claimed by the Contractor on account of emergency work shall be determined as specified under Section A-2. Should the Engineer deem an emergency condition to exist, the Contractor shall immediately do those things and take those steps ordered by the Engineer. The decision of the Engineer in this respect shall be final and conclusive. Any claims for compensation made by the Contractor on account of emergency work shall be determined as specified under Section A-2.
- h) Except as provided by Government Code Section 4215, the Contractor shall be responsible for the removal, relocation and protection of all public and private utilities, including irrigation facilities in the nature of utilities, located on the site of the construction Project if and to the extent that the same are identified in the Contract Documents, and the Contractor shall not be entitled to any extension of time or claim for damages for extra compensation in connection therewith. If and to the extent that such utilities or facilities are not identified in the Contract Documents, as between the Contractor and the City, the City will be responsible for the cost of their removal, relocation or protection, as the case may be, but the Contractor shall perform any such work in conformance with applicable provisions of Sections A-2A and A-2B, if so directed by the Engineer. In such situations the Contractor shall not be responsible for delay in completion of the Project caused by the failure of the City or the owner of the utility to provide for such removal or relocation. If the Contractor, while performing the Contract, discovers utility or irrigation facilities not identified by the City in the Contract Documents, the Contractor shall immediately notify the Engineer in writing.
- i) Subject to the provisions of this Section, where the Work to be performed under the Contract crosses or otherwise interferes with existing streams, watercourses, canals, farm ditches, pipelines, drainage channels, or water supplies, the Contractor shall provide for such watercourse or pipelines and shall perform such construction during the progress of the Work so that no damage will result to either public or private interests, and the Contractor

shall be liable for all damage that may result from failure to so provide during the progress of the Work.

4) Accidents

- a) The Contractor shall provide and maintain, in accordance with Labor Code Section 6708 and OSHA requirements, adequate emergency first-aid treatment for its employees and anyone else who may be injured in connection with the Work.
- b) The Contractor shall promptly report in writing to the Engineer all accidents whatsoever arising out of or in connection with, the performance of the Work, whether on or adjacent to the site, which caused death, personal injury, or property damage, giving full details and statements of witnesses. In addition, if death or serious injury or serious damage is caused the accident shall be reported immediately by telephone or messenger to the City and the Engineer.
- c) If any claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

5) No Personal Liability

Neither the City, the Engineer, nor any of their other officers, agents, or employees shall be personally responsible for any liability arising under the Contract, except such obligations as are specifically set forth herein.

- F. Exclusions – This insurance does not cover tools owned by mechanics, any tools, equipment, scaffolding, staging, towers, and forms rented or owned by the Contractor, the capital value of which is not included in the cost of the work or any shanties or other structures erected for the sole convenience of the workers.
- G. Beginning of Work, Time of Completion and Liquidated Damages – Time is of the essence on this contract. The Contractor shall show evidence that all necessary materials have been ordered within TEN (10) working days from the date the Notice to Proceed is issued by the Engineer or a stop work notice will be issued and any applicable working days will be charged.

The Contractor shall begin work on or before the tenth (10th) working day after the date of the Notice to Proceed, and shall diligently prosecute the same to completion within **Time of Completion** specified in the Supplementary Specifications Section 00800.

It is understood that failure of the Contractor to complete the work within the stipulated number of days will or may subject the City to serious loss or damage.

Should the Contractor fail to complete the work provided for herein, within the time fixed for such completion, due allowance being made for unavoidable delays, he/she shall become liable to the City for the amount specified under **Liquidated Damages** in the Supplementary Conditions Section 00800, for each day said work remains incomplete beyond the time for completion, as and for liquidated damages and not as a penalty, agreed upon by the parties to the contract, it being expressly stipulated that it would be impracticable and extremely difficult to fix the actual amount of damage. If it appears to the Contractor that he/she will not complete the work provided in this contract in the time agreed, he/she shall make written application to the City at least FIVE (5) CALENDAR DAYS PRIOR TO THE EXPIRATION OF THE TIME FOR SUBSTANTIAL COMPLETION, stating the reason why and amount of extension which he/she believes should be granted. The City may then, in its discretion, grant or deny, such extension.

Any money due, or to become due, the Contractor may be retained to cover the said liquidated damages, and should such money not be sufficient to cover such damages, the City shall have the right to recover the balances from the Contractor, or his/her sureties.

4. **Scope of the Work**

- A. **General** – Attention is directed to the Division I – General Provisions, Section 4 of the Standard Specifications, as supplemented herein, for the requirements and conditions concerning the scope of the work.
- B. **Increased and Decreased Quantities** – All items of work will be paid for at the respective prices listed in the proposal or bid for any quantities of such work done and accepted by the City. No adjustments to unit prices will be made for any increase or decrease of actual, final quantities from the Engineer's estimated bid sheet quantities.

The first and second paragraphs of Section 4-1.05, "Changes and Extra Work," of the Standard Specifications are amended to read:

The City reserves the right without changing the scope of work, to make such alterations deviations, additions to or deletions from the plans and specifications, including but not limited to, the right to add or delete any portion of the work to be done with no additional compensation or change in lump sum or unit bid prices. The City also reserves the right without changing the scope of work, to increase or decrease the quantity of any item (BY UP TO 100%) or portion of the work, as may be deemed by the Engineer to be necessary or advisable and to require such extra work as may be determined by the Engineer to be required for the proper completion or construction of the whole work contemplated.

Engineer Estimate quantities are approximate only, and will be used as a basis for a comparison of bids.

- C. Hours of Work – Regular working hours are 7:00 a.m. to 5:00 p.m., Monday through Friday, excluding holidays observed by the City. No work outside of the regular working hours shall be done unless previously requested by the contractor in writing and approved by the Engineer. The Contractor shall be responsible for reimbursement to the City for the cost of providing inspection outside the normal workday or on weekends or holidays. All inspection work outside the regular work hours shall be charged at each inspector's current overtime rate with applicable overhead.

All existing pits, excavations, trenches, and openings in the road surface shall be backfilled and paved to produce a level and smooth surface. All barricades and barriers shall be removed from traffic lanes, unless authorized by the Engineer.

- 5. Control of the Work – Attention is directed to the Division I, Section 5 of the Standard Specifications for the requirements and conditions concerning control of the work.
- 6. Control of Materials – Attention is directed to the Division I, Section 6 of the Standard Specifications for the requirements and conditions concerning the control of materials.
- 7. Legal Relations and Responsibility
 - A. General – Attention is directed to the Division I, Section 7 of the Standard Specifications, as supplemented herein, for the requirements and conditions concerning legal relations and responsibility.

- B. Hours of Labor – Eight hours labor constitutes a legal day's work. The Contractor shall forfeit, as a penalty, to the City, \$25.00 for each work person employed in the execution of the contract by the Contractor or any Subcontractor under him/her for each calendar day during which such work person is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of provisions of the Labor Code of the State of California, Section 1810 to Section 1815.
- C. Public Convenience and Safety – Public Convenience and Safety shall be in accordance with Section 6-12 Public Convenience and Safety of the El Dorado County Standard Construction Specifications.
- D. Damage to Private Property – Any damage to private property caused by the Contractor and adjudged to be the responsibility of the Contractor by the Engineer shall be rectified to the satisfaction of the Engineer within a reasonable time, depending on the extent of the damage. Said reasonable time shall be as determined by the Engineer, and if the condition is not rectified, the Engineer shall have the power and authority to rectify said damage and the cost thereof to be paid for by the Contractor, either by direct payment to the City of Placerville, or by deducting said amount from moneys due the Contractor.

8. Measurement and Payment

A. Measurement of Quantities

- 1) Where the Contract provides for payment on a "Lump Sum" or "Job" basis shall result in a complete structure, operating plant or system in satisfactory working condition in respect to the functional purposes of the installation, and no extra compensation will be allowed for anything omitted but fairly implied.
- 2) 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 City 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. The 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 and materials furnished and the estimated amount.
- 3) All quantities of work computed under the Contract shall be based upon measurements in accordance with the United States Measurements and Weights.

- 4) Methods of measurement are specified herein and in the Technical Specifications.

B. Scope of Payment

- 1) The 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 the acceptance by the City and for all risks of every description connected with the prosecution of the Work, also 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 Specifications and Plans. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective work or material.
- 2) No compensation will be made in any case for loss of anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as provided in such agreements.
- 3) The Work includes the preparatory work and operations needed for mobilization and demobilization of the Project.

C. Progress Estimate

For each pay period of Contract work, the Contractor shall prepare a written progress estimate of the value of all work performed under the Contract, including any amounts due the Contractor for Extra Work and Change Orders. In arriving at the value of the work done, the Contractor shall give consideration to the value of labor and materials which have been incorporated into the permanent work during the preceding month. Consideration will not be given to preparatory work done or for materials or equipment on hand. The Contractor shall verify the estimated quantities of all pay items with the City's Inspector prior to submitting a final Progress Payment Request to the Engineer. Progress Payment Requests shall be submitted to the Engineer by the end of each month.

To assist the Engineer in reviewing Progress Payment Requests, all Progress Payment Requests submitted by Contractor shall be accompanied by sufficient documentation to validate payable quantities for the preceding pay period.

Documentation shall include, but is not limited, Quantity Sheets for each bid item, in a form approved by the Engineer, summarizing the daily quantity placed/installed with dimensions and location (with centerline station to station references and left or right indicated) and copies of invoices and/or trucking delivery tags.

In addition to the Progress Payment Request, the City Finance Department requires that the contractor submit a billing invoice including a sequential invoice number and the date range of the work that is being billed for.

Additional documentation may be requested by the Engineer to adequately verify any bid item quantity.

D. Progress Payments

- 1) The City will pay the Contractor ninety-five percent (95%) of the amount of each progress estimate within 30 days after receipt of an undisputed and properly submitted progress estimate from the Contractor. If the City fails to pay an undisputed progress estimate within the allotted thirty (30) days, the City shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of section 685.010 of the Code of Civil Procedure. Five percent (5%) of the amount of each estimate shall be retained by the City until final completion and acceptance of all work under the Contract.
- 2) Upon receipt of a payment request, the City shall act in accordance with both of the following:
 - a) Each payment request shall be reviewed by the City as soon as practicable after receipt for the purpose of determining that the progress estimate is a proper payment request.
 - b) Any payment request determined not to be a proper payment request suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) days, after receipt. A request returned pursuant to this Section shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.
- 3) The number of days available to the City to make a payment without incurring interest pursuant to this Section shall be reduced by the number of days by which the City exceeds the seven-(7) day return requirement set forth in paragraph (ii) of subdivision (b).

- 4) The Contractor may, in accordance with the provisions of Public Contracts Code section 22300, substitute securities for any monies, which the City may withhold to ensure performance under the Contract.
- 5) When, in the judgment of the Engineer, the Work is not proceeding in accordance with the provisions of the Contract, or when in the Engineer's judgment the total amount of the Work done since the last estimate amounts to less than one thousand dollars (\$1,000), no pay estimate will be prepared and no progress payment will be made.
- 6) No progress estimate or payment shall be considered to be an approval or acceptance of any work, materials or equipment. Estimated amounts and values of work done and materials and equipment furnished will be conformed to actual amounts and values as they become available in subsequent progress estimates, progress payments and the final estimate and payment. All estimates and payments will be subject to correction in subsequent progress estimates and payments and the final estimate and payment.
- 7) It is mutually agreed between the parties to the Contract that no payments made under the Contract, including progress payments and the final payment shall be evidence of the performance of the Contract, either wholly or in part, and no payment shall be construed to be an acceptance of any defective or incomplete work or improper materials.
- 8) Per State Standard Specification 9-1.16E(3), the City may withhold a part of a progress payment if the contractor fails to provide documentation required by the contract including traffic control plans, water pollution control program, schedules, submittals, payrolls, etc.

E. Liens and Stop Notices

The Contractor agrees to keep the Work, the site of the Work and all monies held by the City free and clear of all liens and stop notices related to labor and materials furnished in connection with the Work, if permitted by law. Furthermore, the Contractor waives any right it may have to file any type of lien or stop notice in connection with the Work. Notwithstanding anything to the contrary contained in the Contract Documents, if any such lien or stop notice is filed or there is evidence to believe that lien or stop notice may be filed at any time during the progress of the Work or within the duration of this Contract, the City may refuse to make any payment otherwise due the Contractor or may withhold any payment due the Contractor a sum sufficient in the opinion of the City to pay all obligations and expenses necessary to satisfy such lien or stop notice. The City may withhold such payment unless or until the Contractor, within ten (10) days after

demand therefor by the City, shall furnish satisfactory evidence that the indebtedness and any lien or stop notice in respect thereof has been satisfied, discharged and released of record, or that the Contractor has legally caused such lien or stop notice to be released of record pending the resolution of any dispute between the Contractor and any person or persons filing such lien or stop notice. If the Contractor shall fail to furnish such satisfactory evidence within ten (10) days of the demand therefor, the City may discharge such indebtedness and deduct the amount thereof, together with any and all losses, costs and damages suffered or incurred by the City from any sum payable to the Contractor under the Contract documents, including but not limited to final payment and retained percentage. This Section shall be specifically included in all Subcontracts and purchase orders entered into by the Contractor.

F. Final Estimate

As soon as possible after the completion of the work and receipt of all documentation required to be submitted by the Contractor is received, the Engineer shall make up the final estimate of the total amount of work done, segregated as to contract item quantities and contract change order work, and the value of such work; and this amount, after deducting all previous payments and all amounts to be deducted and retained under the provisions of the contract, shall constitute the final payment. All prior estimates and payments shall be subject to correction in the final estimate.

Within fifteen (15) calendar days after the proposed final estimate is submitted to the Contractor, the Contractor shall submit to the Engineer the Contractor's written approval of said estimate or a written statement of the Contractor's exceptions thereto. If the Contractor files a statement of exceptions, it shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of said claims. If the Contractor fails to file a statement within the time allowed, it shall be construed to be acceptance of the final estimate as submitted to the Contractor. Any claim of the Contractor or the Contractor's subcontractors or suppliers with respect to the performance or breach of the contract or any alterations thereof (except for payment of the balance of the contract price as set forth in the final estimate) not specifically set forth in such a statement is waived by the contractor.

G. Right to Withhold Payments

- 1) In addition to all other rights and remedies of the City hereunder and by virtue of the law, the City may withhold or nullify the whole or any part of any partial or final payment to such extent as may reasonably be necessary to protect the City from loss on account of:

- a) Defective work not remedied, irrespective of when any such work be found to be defective;
 - b) Claims or liens filed or reasonable evidence indicating probable filing of claims or liens including, but not limited to claims under Sections 1775, 1776, or 1777.7 of the Labor Code;
 - c) Failure of the Contractor to make payments properly for labor, materials, equipment, or other facilities, or to Subcontractors and/or suppliers;
 - d) A reasonable doubt that the Work can be completed for the balance then unearned;
 - e) A reasonable doubt that the Contractor will complete the Work within the agreed time limits;
 - f) Costs to the City resulting from failure of the Contractor to complete the Work within the proper time; or
 - g) Damage to work or property.
- 2) Whenever the City shall, in accordance herewith, withhold any monies otherwise due the Contractor, written notice of the amount withheld and the reasons therefor will be given the Contractor. After the Contractor has corrected the enumerated deficiencies, the City will promptly pay to the Contractor the amount so withheld. When monies are withheld to protect the City against claims or liens of mechanics, materialmen, Subcontractors, etc., the City may at its discretion permit the Contractor to deliver a surety bond in terms and amount satisfactory to the City, indemnifying the City against any loss or expense, and upon acceptance thereof by the City, the City shall release to the Contractor monies so withheld.

H. Final Payment

On the expiration of thirty-five (35) days from the date of Final Acceptance of the contract and the filing of the Notice of Completion with the Office of the County Recorder, the difference between the final estimate and all payments theretofore made to the Contractor shall be due and payable to the Contractor, subject to any requirements concerning the furnishings of a maintenance bond, and excepting only such sum or sums as may be withheld or deducted in accordance with the material furnished to the City on the located at provisions of this Contract. All prior certifications upon which partial Payments may have been

made, being merely estimates, shall be subject to correction in the final certificate.

I. Final Release

Final payment to the Contractor in accordance with the final estimate is contingent upon the Contractor furnishing the City with a signed written release of all claims against the City arising by virtue of the Contract. The Contractor, from the operation of the release, may specifically exclude disputed Contract claims in stated amounts. The release shall be in substantially the following form:

WAIVER AND RELEASE UPON FINAL PAYMENT

The undersigned has been paid in full, less retention, by the City for all labor, services, equipment and material furnished to the City on the _____ (name of Project) located at _____ and does hereby waive and release the City, its officers, agents, and employees, from all claims and liability to the Contractor arising out of, or in any way connected with, the Contract, except for the disputed contract claims specified below:

Notice of Disputed Claim Amount of Claim

\$ _____

Date

Name, Title

Name of Contractor

J. Waiver of Interest

The City shall have no obligation to pay and the Contractor hereby waives the right to recover interest with regard to monies, which the City is required to withhold by reason of judgment, order, statute or judicial process.

9. Antitrust Claim Assignment

In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to this contract, the Contractor and all Subcontractors shall offer and agree to assign to the City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. 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 subcontract. This assignment shall be made and become

effective at the time the City tenders final payment to the Contractor, without further acknowledgement by the parties.

10. Prosecution and Progress

Attention is directed to the provisions of the Standard Specifications for the requirements and conditions concerning the prosecution and progress of the work and the assignment of the contract.

11. Permits and Code

A. The Contractor shall give all notices required by and comply with all applicable laws, ordinances and codes of the City of Placerville. All construction work and/or utility installations shall comply with all applicable ordinances and codes including all written waivers. Before installing any work, the Contractor shall examine the Drawings and Technical Specifications for compliance with applicable ordinances and codes and shall immediately report any discrepancy to the City Engineer of the City of Placerville. Where requirements of the Drawings and Technical Specifications fail to comply with such applicable ordinances and codes, the City of Placerville will adjust the contract by Change Order to conform to such ordinances and codes (unless waivers in writing covering the differences have been granted by the governing body or department) and make appropriate adjustment in the contract price or stipulated unit prices.

Should the Contractor fail to observe the foregoing provisions and proceed with the construction and/or install any utility variance with any applicable ordinance or Code including any written waivers (not with-standing the fact that such installation is in compliance with the Drawings and Technical Specifications) the Contractor shall remove such work without cost to the City and a Change Order will be issued to cover only the excess cost the Contractor would have been entitled to receive if the change had been made before the Contractor commenced work on the items involved.

B. The Contractor shall comply with applicable laws and ordinances governing the disposal of surplus excavation, materials, debris and rubbish on or off the project area and commit no trespass on any public or private property in any operation due to or connected with the improvements embraced in this contract.

12. Apprenticeship Requirements

California Labor Section 1777.5 requires in the employment of apprentices in public works contracts:

- A. Only registered apprentices within a written agreement in an approved apprentice- training program providing no less than 2,000 hours of continuous employment and education are eligible for employment on public works (in compliance with Labor Section 3077).
- B. A contractor is no longer required to submit Form DAS-7, but must submit award information to the local applicable joint apprenticeship committee. The award information must include:
 - 1) an estimate of the journeyman hours;
 - 2) the number of apprentices to be employed; and
 - 3) the approximate dates of apprentice employment.
- C. The minimum statutory 1:5 hourly ratio of work stipulates that no less than one hour of apprentice work for every five hours of journeyman labor on any day of work. (Any journeyman work performed beyond 8 hours per day or 40 hours per week shall not be used to calculate the hourly ratio.)

This section shall not apply to specialty contractors or general contractors whose contracts involve less than Thirty Thousand Dollars (\$30,000.00) or 20 working days.

The Division of Apprenticeship Standards may grant a certificate exempting the contractor from the minimum 1:5 hourly ratio under any one of the following:

- 1) Unemployment exceeds an average of 15% in the area for the previous 3-month period;
 - 2) The number of apprentices in training in such area exceeds a ratio of 1:5;
 - 3) The apprentice able craft or trade is replacing at least one-thirtieth of its journeymen annually through apprenticeship training, either locally or statewide;
 - 4) The specific task would jeopardize the apprentice's life or public safety or no training can be provided to an apprentice by a journeyman for the specific task.
- D. Apprentices employed on public works projects can only be assigned to perform work of the craft or trade to which the apprentice is registered.

E. All contractors with employees in any apprentice able occupation, regardless of the actual employment of journeymen or apprentices for the awarded public work, must either contribute to the local training trust fund or to the California Apprenticeship Council, P.O. Box 603, San Francisco, CA 94101 (as set forth in Section 227).

F. Any person who violates Section 1777.5 shall pay a civil penalty of Fifty Dollars (\$50.00) for each calendar day of noncompliance.

Any person who willfully violates Section 1777.5 shall pay the Fifty Dollars (\$50.00) fine for each calendar day of noncompliance and shall be denied the right to bid on, or to receive, any public works contract for a period of up to one year for the first violation and up to three years for any additional violations.

Compliance disputes arising under Section 1777.5 shall be adjudicated under 8 California Code of Regulations, Article 1.

G. Within five (5) days of a public works contract award, the awarding agency must send a copy of the award to the Division of Apprenticeship Standards under Section 1773.3.

Within five (5) days of finding any discrepancy regarding the hourly ratio of apprentices to journeymen, the awarding agency shall notify the Division of Apprenticeship Standards.

H. The Contractor shall be responsible for compliance for all requirements for occupations subject to apprenticeships as provided by this Contract and/or applicable law.

13. Subcontracting

Attention is directed to the provisions in Section 5-1.13, "Subcontracting" of the Standard Specifications and these Special Provisions.

Installation of traffic signals shall be considered a "Specialty Item" as defined in Section 7 of the Caltrans Standard Specifications.

In accordance with the requirements of Sections 4100 and 4113, inclusive, of the Public Contract Code, each bidder shall list in his proposal all the names and business address of each subcontractor to whom the bidder proposes to subcontract work and shall list each subcontractor licensed by the State of California. Said list shall include a description of the portion of the work which will be done by each subcontractor.

A sheet for listing the subcontractors, as required, is included in the proposal.

14. Performance of Subcontractors and Suppliers

The Subcontractors and suppliers listed in the Proposal shall perform the work and supply the materials for which they are listed unless the Contractor has received prior written authorization from the Engineer to perform the work with other forces or to obtain the materials from other sources.

Authorization to utilize other forces or sources of materials may be requested for the following reasons:

- A. The listed subcontractor, after having had a reasonable opportunity to do so fail or refuses to execute a written contract, when such written contract, based upon the general terms, conditions, plans and specifications for the project, or on the terms of such subcontractor's or supplier's written bid, is presented by the Contractor.
- B. The listed subcontractor becomes bankrupt or insolvent.
- C. The listed subcontractor fails or refuses to perform his subcontract or furnish the listed materials.
- D. The Contractor stipulated that a bond was condition of executing a subcontract and the listed subcontractor fails or refuses to meet the bond requirements of the Contractors.
- E. The work performed by the listed subcontractor is substantially unsatisfactory and is not in substantial accordance with the plans and specifications, or the subcontractor is substantially delaying or disrupting the progress of the work.
- F. It would be in the best interest of the City.

The Contractor shall not be entitled to any payment for such work or material unless it is performed or supplied by the listed subcontractor or by other forces (including those of the Contractor) pursuant to prior written authorization of the Engineer.

15. Permits and Licenses

Attention is directed to Section 5-1.20B, "Permits, Licenses, Agreements, and Certificates" of the Standard Specifications and these Special Provisions.

The California 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 local agencies 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 City has obtained permits, licenses or other authorizations, applicable to the work, in conformance with the requirements in said California Environmental Quality Act of 1970, the Contractor shall comply with the provisions of said permits, licenses, and other authorizations.

16. Statistical Testing

Moving average requirements are waived.

17. Highway Construction Equipment

Attention is directed to Sections 7-1.02O, "Vehicle Code" and 5-1.33, "Equipment" of the Standard Specifications and these Special Provisions.

Pursuant to the authority contained in Section 591 of the Vehicle Code, the Department has determined that, within such areas as are within the limits of the project and are open to public traffic, the Contractor shall comply with all of the requirements set forth in Divisions 11, 12, 13, 14, and 15 of the Vehicle Code. Attention is directed to the statements in Section 591 that this section shall not relieve the contractor or any person from the duty of exercising due care. The Contractor shall take all necessary precautions for safe operation of his/her equipment and the protection of the public from injury and damage from such equipment.

18. Equipment Rental Rates

The requirements concerning equipment rental rates in Section 9-1.04D, "Equipment Rental" and Section 9-1.04D(3), "Equipment Not On the Job Site Work and Not Required for the Original- Contract Work", of the Standard Specifications are modified as follows:

The Contractor will be paid for the use of equipment at the rental rates listed for such equipment in the Department of Public Works, Division of Highway's publication Section 9-1.03A (3), "Equipment Not On the Job Site and Not Required for Original-Contract Work" of the Standard Specifications is amended by adding the following:

When extra work, other than work specifically designated as extra work in the plans and specifications, is to be paid for on a Force Account basis and the Engineer determines that such extra work required the Contractor to move on to the work equipment which could not reasonably have been expected to be needed in the performance of the contract, the Engineer may authorize payment for the use of such equipment at

equipment rental rates in excess of those listed as applicable for the use of such equipment subject to the following additional conditions:

- A. The Engineer shall specifically approve the necessity for the use of particular equipment on such work.
- B. The Contractor shall establish to the satisfaction of the Engineer that such equipment cannot be obtained from his/her normal equipment source or sources and those of his/her subcontractors.
- C. The Contractor shall establish to the satisfaction of the Engineer that the proposed equipment rental rate for such equipment from his/her proposed source is reasonable and appropriate for the expected period of use.
- D. The Engineer shall approve the equipment source and the equipment rental rate to be paid by the State before the Contractor begins work involving the use of said equipment.

19. Sound Control Requirements

The 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.

The noise level from the Contractor's operations, between the hours of 9:00 p.m. and 7:00 a.m. shall not exceed 50 dBA, and between the hours of 7:00 a.m. and 9:00 p.m. shall not exceed 80 dBA at a distance of 50 feet.

Said noise level requirement shall apply to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

20. Hazardous Waste in Excavation

If the Contractor encounters material in excavation that the contractor has reason to believe may be hazardous waste as defined by Section 25117 of the Health and Safety

Code, the contractor shall immediately so notify the Engineer in writing. Excavation in the immediate area of the suspected hazardous material shall be suspended until the Engineer authorizes it to be resumed. If such suspension delays the current controlling operation, the Contractor shall be granted an extension of time as provided in Section 8-1.10, "Liquidated Damages", of the Standard Specifications.

If such suspension delays the current controlling operation by more than 2 working days, the delay shall be considered a right of way delay and the Contractor shall be compensated for such delay as provided in Section 8-1.07, "Delays", of the Standard Specifications.

The City reserves the right to use other forces for exploratory work to identify and determine the extent of such material and for removing hazardous material from such area.

21. Referenced Specifications

The references to State specifications and other specifications for the various materials to be furnished by the Contractor shall include, in addition to the basic specifications referred to, all applicable amendments to the specifications and all emergency alternate specifications which have been promulgated and are in effect on the date bids are received. When more than one reference specification is referred to for a material, the material used shall be the one of the highest grade or standard.

22. Safety

A. General

- 1) The Contractor shall be solely and completely responsible for the conditions of the job Site, including safety of all persons and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to all applicable Federal, State, and local laws, ordinances, and codes, and to the rules and regulations established by the California Division of Industrial Safety, and to other rules of law applicable to the Work.
- 2) The services of the Engineer in conducting construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's work methods, equipment, bracing or scaffolding or safety measures, in on, or near the construction site, and shall not be construed as supervision of the actual construction nor make the Engineer or the City responsible for providing a safe place for the performance of work by the Contractor, Subcontractors, or

suppliers; or for access, visits, use work, travel or occupancy by any person.

- 3) The Contractor shall carefully instruct all personnel working in potentially hazardous work areas as to potential dangers and shall provide such necessary safety equipment and instruction as is necessary to prevent injury to personnel and damage to property. Special care shall be exercised relative to electrical work, work involving excavation and in sump pump work.
- 4) All work and material shall be in strict accordance with all applicable State, Federal and local laws, rules, regulations, and codes
- 5) Nothing in this Contract is to be construed to permit work not conforming to governing law. When Contract Documents differ from governing law, the Contractor shall furnish and install the higher standards called for without extra charge. All equipment furnished shall be grounded and provided with guards and protection as required by safety codes. Where law requires vapor-tight or explosion-proof electrical installation, this shall be provided.
- 6) The Contractor shall submit a safety plan and/or narrative description to the Engineer prior to commencement of the Work. This safety plan and/or narrative description shall describe all first aid, safety clothing, etc. to be used at Project Site.

B. Shoring and Trench Safety Plan

- 1) Attention is directed to Section 832 of the Civil Code of the State of California relating to lateral and subjacent support. The Contractor shall comply with this and other applicable laws including Public Contract Code section 7104.
- 2) In accordance with Section 6705 of the State Labor Code, the Contractor shall submit to the City specific plans to show details of provisions for worker protection from caving ground. Not less than thirty (30) days before beginning excavation for any trench or trenches five feet or more in depth required under this Contract, the Contractor shall furnish to the Engineer working drawings of its trench safety plan. The trench safety plan working drawings shall be detailed plans showing the design of the shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground. If such plan varies from shoring system standards established by the Construction Safety Orders of the California Division of Industrial Safety or the Federal Safety and

Health Regulations for Construction of the Occupational Safety and Health Administration, Department of Labor, the plan shall be prepared by a registered civil or structural engineer. In no event shall the Contractor use a shoring, sloping or protective system less than required by the Construction Safety Orders, or less effective than that required by the Federal Safety Standards. Submission of this plan in no way relieves the Contractor from the requirement to maintain safety in all operations performed by itself or its Subcontractors.

23. Warranty Bond

As a condition precedent to the completion of this contract, the Contractor shall furnish in triplicate a bond of a surety company authorized to do business in the State of California acceptable to the owner in an amount of one hundred percent (100%) of the total contract price plus change orders, to hold good for a period of one year after the completion and acceptance of the work, to protect the City against the results of defective materials, work quality and equipment during that time. This bond shall be delivered to the City before the Engineer shall recommend the acceptance of the work to the City Council.

SECTION C – WAGE AND EQUIPMENT RATES

1. Prevailing Wage Rates – In accordance with the provisions of Section 1770 of the Labor Code of the State of California, the Director of the Department of Industrial Relations has determined the general prevailing rate of per diem wages applicable to the work to be done, and a current copy of said prevailing wages is on file with the City Clerk. Should the minimum Federal Wage Rate be higher than the rate determined by the Director of the Department of Industrial Relations, then the Federal Wage Rate Determination shall govern.

The successful bidder will be required to post a copy of these general prevailing rates of per diem wages in a conspicuous place at the job site forthwith upon undertaking the public work called for herein.

In addition, the City of Placerville requires that the Contractor and all his/her Subcontractors shall pay their employees on said work a salary or wage at least equal to the prevailing salary or wage for work of similar character in the locality in which the public work is performed. The Contractor shall, as a penalty, forfeit to the City the amount specified by law for each calendar day or portion thereof, for each employee paid less than the prevailing salary or wage for any public work done under the contract by him/her or any subcontractor under him/her.

The State Labor Code states that for violations of public works laws relating to payment of prevailing wages, the City of Placerville will be required to withhold from any progress

payments owed to a contractor any amounts that have been forfeited as penalties, or as wages owed to employees, who have not been paid the prevailing wage for work performed. Effective 1/1/97, the City is required to directly transfer all withheld wages and penalties to the Labor Commissioner for disbursement in those cases where a contractor fails to bring a lawsuit for amounts withheld within 90 days after the completion of the public works contract and formal acceptance of the job by the City.

Also, the Labor Commissioner is permitted to intervene in any lawsuit brought by the contractor against an awarding body for recovery of amounts withheld. In the event that the contract does not prevail in the lawsuit to recover the amounts withheld, the wages and penalties will then be forwarded to the Labor Commissioner for disbursement in the manner previously described.

2. Payroll Record – In accordance with the provisions of Section 1776 of the Labor Code of the State of California, the Contractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed by the Contractor in connection with this project. This payroll record shall be certified and submitted weekly to the Resident Engineer. Additionally it shall be available for inspection at all reasonable hours at the principal office of the successful bidder and a certified copy shall be furnished within ten (10) days after receipt of a written request by the following parties:
 - A. An employee or his/her authorized representative
 - B. City's representative
 - C. Representative of Labor Standard Enforcement and Division of Apprenticeship Standard of Department of Industrial Relations

Any copy of the payroll record made available for inspection and furnished to the public through the above entities shall not disclose names, addresses or social security numbers of individual employees except the name and address of the Contractor.

In the event of non-compliance with the requirement of this subdivision, the Contractor shall have ten (10) days in which to comply subsequent to receipt of written notices from the State or City. If the non-compliance is still evident after the ten-day period, the Contractor shall, as a penalty, forfeit to the City the amount specified by law for each calendar day, for each employee, until strict compliance is effectuated.

3. Equipment Rental Rates – Equipment rental will be paid for as provided under Section 9-1.03A of the State Standard Specifications at the rates listed in the EQUIPMENT RENTAL RATES TABLE of the State of California, Department of Public Works, Division

of Highways, latest issue, for use in their Special Provisions, a copy of which Table of Rates is filed in the City Engineer's Office.

4. Employment of Apprentices – The Contractor's attention is directed to California Labor Code sections 1777.5, 1777.6 and 1777.7 pertaining to employment of indentured apprentices, which are hereby incorporated by reference into this Contract. As applicable, the Contractor or any subcontractor employed by it in the performance of the Contract work shall take such actions as necessary to comply with the provisions of sections 1777.5, 1777.6 and 1777.7.
5. Public Works Contractor Registration – In accordance with California Labor Code Section 1771.1(a), a contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this Division 2, Part 7, Chapter 1 of the Labor Code (commencing with Section 1720), unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. In accordance with Labor Code section 1771.4(a)(1), this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

SECTION D – GENERAL CONSTRUCTION DETAILS

1. Scope of Work – For all work on this project the Contractor shall furnish all labor, materials, tools, equipment, transportation, appliances and services required to completely execute the work as set forth on the drawings and in these specifications. The subdivision of these specifications into divisions is not intended to strictly set forth or limit the scope of any subcontractor and shall not relieve the Contractor of the responsibility for executing all work on the project as a whole.
2. Reference – Specific reference is hereby made to the State of California Standard Specifications, Department of Transportation, Division of Highways, 2015 edition; the El Dorado County Community Development Agency, Improvement Standards, current edition.
3. Pre-Construction Conference – The Contractor, City Engineer and other interested parties shall meet at a pre-construction conference to be scheduled after execution of the construction contract and prior to the start of construction. The purpose of this conference is to review job schedules, traffic control, affirmative action, and to discuss various other aspects of the work and to clarify procedures.

The Contractor shall submit the following to the City Engineer by the date of the pre-construction conference:

- A. Detailed Construction Schedule for review and approval.

- B. Detailed Traffic Control and Pedestrian Routing Plan for review and approval.
 - C. Erosion and Sediment Control Plan.
 - D. Any other material or required submittals for review and approval. All submittals shall be in writing.
 - E. "Notice" to homeowners and/or affected parties for review and approval.
4. Construction Schedule – The proposed construction schedule shall indicate the various subdivisions of work and the date of commencing and finishing of each. The Engineer, prior to the start of work, shall approve the form of the schedule. The schedule shall be considered as advisory to the Engineer of the Contractor's plans for completing the work within the Contract time and shall in no way be construed to operate as an agreement or guarantee by the Engineer, upon the acceptance of its form, of the Contractor's production. The Contractor shall be obligated to complete the work within the Contract time. At the Engineer's discretion, should the work not conform to the Contractor's progress schedule, the Engineer may request in writing a new schedule reflecting the work as currently progressing. The Contractor shall provide the new schedule within one week of the written request.
5. Weekly Statement of Working Days – The Engineer will furnish the 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 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. The Contractor will be allowed 15 days from the issuance of the weekly statement of working days in which to file a written protest setting forth in what respects the Contractor differs from the Engineer, otherwise the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct.
6. Verification of Conditions – The Contractor shall verify all existing conditions before commencing work. All discrepancies between the drawings and actual field conditions shall be immediately reported to the City Engineer in writing who shall determine if modifications in the work are necessary. The Contractor shall not modify the work without prior authorization from the City.
7. Substitutions – Any substitutions of materials, equipment, construction methods, etc. from those noted in the drawings and specifications must be approved in writing by the City Engineer prior (10 working days) to their use or application or installation in the field.
8. Underground Utilities – In accordance with Government Code section 4215, the Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating

existing main or trunk line utility facilities which are not indicated in the Contract Plans and Specifications with reasonable accuracy, and for the equipment on the Project necessarily idled during such work, provided that the Contractor shall first notify the Engineer before commencing work on locating, repairing damage to, removing or relocating such utilities. Contractor shall not be liable for liquidated damages or delays caused by the removal or relocating of utilities when such removal or relocations is the responsibility of the City or the owner of the utility pursuant to Government Code Section 4215.

9. Materials and Tests – All materials incorporated in the project shall meet the requirements of tests specified in the Standard Specifications and other minimum requirements specified herein or in these special provisions. Attention is directed to Section 6 of the Caltrans Standard Specifications.

The Contractor shall furnish written laboratory reports from a reputable testing or inspection agency, or written certification from the manufacturer as to compliance with the Specifications as to the composition, durability and performance of the all materials used in the project. Certain specification sections may require special items or materials to be included in the submittal. Reference is made to the Technical Specifications for specific instructions.

These reports on any material must be submitted to the Engineer in writing and approved by the Engineer before incorporating that material in the work. All material shall be adequately identified by tags or other means as that material which has been tested and approved. Lack of proper identification shall be considered adequate cause for rejection of any material which cannot be properly inspected on the job.

The City reserves the right to make such additional inspections or tests as it may require prior to acceptance of any materials, and also reserves the right to reject any material previously approved because of serious defects or damage discovered subsequent to such approval. Any material rejected by the City shall immediately be removed from the job site, and no payment will be allowed therefor.

The Contractor shall bear the expense for all unsatisfactory tests and deductions will be made from any moneys due or to become due the Contractor, sufficient to cover the cost of the tests.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved for testing and sampling of material from any source shall be considered as included in the price paid for the contract item of work involving such material and no additional compensation will be allowed therefor.

10. City Furnished Materials – The City will furnish to the Contractor free of charge for use under these Specifications the materials specified as “City Furnished” in the Technical Specifications. Contractor shall furnish all other materials called for under this contract.

11. Sequence of Constructing to Maintain Traffic – Attention is directed to the Work Sequencing section of the Caltrans Standard Specifications. Restriction of parking on the street will be permitted only when authorized by the Engineer.

The Contractor must submit a detailed schedule of operations to the City for its review and approval prior to starting work on the project to enable the City Engineer to ascertain that the intent of Section 10 of the Standard Specifications is being complied with and followed.

13. Obstructions – Attention is directed to the presence of water, fire alarms, telephone, sewer, drainage, gas lines, overhead utilities and underground power lines in the construction area.

The work shall be conducted as to permit utility companies to maintain their services without interruption.

Minor adjustments of pole lines, pipe lines, and other public improvements may be undertaken by the owners of these improvements during the progress of the work. The Contractor shall cooperate with the owners of the improvements during the progress of the work. The Contractor shall cooperate with the owners of the improvements and shall so coordinate his work as to avoid damage to any of these improvements.

Abandoned utility pipe lines and conduits, if encountered, shall be removed and disposed of off the job site by the contractor in accordance with the requirements of the Caltrans Standard Specifications.

Full compensation for conforming to the requirements of this Section not otherwise provided for, shall be considered as included in the prices paid for the various contract items or work, and no additional allowance will be made therefor.

13. Contractor's Responsibility – The Contractor shall be completely responsible for the care and condition of the project improvements in their entirety until completion of the maintenance period and acceptance by the City. The Contractor shall provide all watchmen, guards, and security devices, as he/she deems necessary. Also, the Contractor and all employees of the Contractor shall obey all applicable laws and City ordinances while performing work under this contract. Any fines assessed to the Contractor and all employees for not obeying the laws and ordinances of this City while performing work under this contract shall be the responsibility of the Contractor or employees to pay.

14. Construction Upon Private Property – The Contractor shall note that the work may be performed on or in the vicinity of private property. The Contractor shall, at all times, remove all litter, debris, and construction waste, minimize noise, dust, standing water, vibrations, hazardous conditions and provide safe access to these properties. The Contractor is prohibited from using any and all privately owned utilities. The Contractor's

materials and equipment shall not be stored upon private property without written approval from the resident and/or owner.

Construction on private property during overtime, weekend, holiday or any other irregular period shall be performed only when the Contractor has requested and received written approval from the adjacent residents and the City Engineer.

Contractor's attention is directed to Section 6-21, "Preservation of Property," of the El Dorado County Standard Construction Specifications. The Contractor shall protect all on-site private improvements, not indicated for removal, from damage. On-site private improvements include but are not limited to trees, shrubbery, ground cover, structures, gates, fences, signs, utility facilities, and drainage facilities. If such objects are damaged, they shall be replaced, repaired and/or restored to a condition equal or better than when the Contractor entered upon the work, as determined by the Engineer. Any damaged materials deemed unsuitable by the Engineer shall become the property of the Contractor and shall be disposed of off the right of way, unless permitted by the City to be disposed of on the work site.

Existing trees, shrubs and other plants, that are not to be removed as shown on the plans or specified elsewhere in these special provisions, and are injured or damaged by reason of the Contractor's operations, shall be replaced by the Contractor. Replacement planting shall conform to the requirements in Section 20-4, "Plant Establishment Work," of the State Standard Specifications.

No separate payment shall be made for the above considerations. Full compensation for the above construction restrictions shall be considered as included in the price paid for the various items of work involved.

15. As-Built Drawings – Maintenance and submittal of Record Drawings by the Contractor shall be in accordance with Section 11-3 Record Drawings of the El Dorado County Standard Construction Specifications.

*****END OF SECTION*****

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**SECTION 00800
SUPPLEMENTARY CONDITIONS**

1.0 MODIFICATIONS TO THE SPECIAL PROVISIONS

1.1 Time Allowed for Completion

In accordance with the provisions of Section 00700, the following milestone completions, substantial completion, and final completion contract times shall be completed within the number of consecutive working days from the date established in the Notice of Proceed for the commencement of Contract Time.

Milestones

Contractual Completion Event

Completion Time

Substantial Completion – Placement of new water main lines and services tested, disinfected, accepted by City, and connected to the existing system. Old facilities abandoned or removed (per plan and specifications). New sewer main, CIPP linings, and CIP manholes installed. All new water and sewer facilities in use, and Pavement Restoration completed.

75 Working Days from Commencement

Final Completion

30 calendar days after Substantial Completion Notification

1.2 Liquidated Damages

In accordance with the provisions of Section 00700, for the period of time that any portion of the work remains unfinished after the time fixed for an interim milestone and/or Substantial Completion in Section 00800-1.1, **Time Allowed for Completion**, as modified by extensions of time granted by the Owner, it is understood and agreed by the Contractor and the Owner that the Contractor shall pay the Owner the damages listed below.

Milestone

**Dollars Per Day
Liquidated Damages
(Amount in Dollars)**

1. Substantial Completion

\$3,000

1.3 **WeatherDays**

No weather days are included as part of this project.

1.4 **Contract Administration**

The following project representatives are hereby designated by the Owner:

A. Name of Owner Representative: Cory Schiestel, Associate Civil Engineer

All communications to and from the Contractor shall be routed through the Owner. Wherever the Contract Documents indicate that the Contractor shall contact or notify the Engineer, Architect, Soils Engineer, Structural Engineer, etc., the Contractor shall route such communication through the Owner except when otherwise explicitly approved by the Owner.

2.0 **LIABILITY AND INSURANCE**

2.1 **Insurance**

Within ten (10) days after notice of award of the Contract, the Contractor shall promptly obtain, at its own expense, all the insurance required by Section 00700-3.E., **LIABILITY AND INSURANCE**, and submit coverage verification for approval by the Owner prior to the Owner's execution of the Contract. The insurance shall provide the minimum coverage and limits set forth below. Providing coverage in these stated minimum limits shall not be construed to relieve the Contractor from liability in excess of such limits. All deductibles and self-insured retentions must be disclosed and are subject to approval by the Contracting Agency. The cost of any claim payments falling within the deductible shall be the responsibility of the Contractor.

The Notice to Proceed with the Work under this Contract will not be issued, and the Contractor shall not commence work, until such insurance has been approved by the Owner. Such insurance shall remain in full force and effect at all times during the prosecution of the Work and until the final completion and acceptance thereof. In addition, the Commercial General Liability insurance shall be maintained for a minimum of one (1) year after final completion and acceptance of the Work.

The Notice to Proceed does not relieve the Contractor of the duty to obtain such insurance as required herein.

The Contractor shall not allow any subcontractor to commence work on its subcontract until all similar insurance required of the subcontractor, except Builder's Risk Insurance, has been obtained and verified by the Contractor and submitted to the Construction Manager for the Owner's review and records. Subcontractors shall furnish original certificates and required endorsements as verification of insurance coverage. The insurance liability limits specified in Section 00700-3.E., **LIABILITY AND INSURANCE**, shall also apply for all subcontractors listed in Section 00430, **DESIGNATION OF SUBCONTRACTORS**. The Contractor shall designate the required insurance liability limits for all other subcontractors.

Companies writing the insurance under this article shall be licensed to do business in the State of California or be permitted to do business under the Surplus Line Law of the State of California. Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A - :VII.

Each insurance policy required by this contract 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 Owner.

Contractor shall include all costs for insurance in its bids.

Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from its operations under this Contract. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the Owner, the Engineer, The City of Placerville and the Construction Manager, and their officers, officials, employees, agents and volunteers. Any insurance or self- insurance maintained by the Owner, its officers, officials, employees, agents or volunteers shall be in excess of the Contractor's insurance and shall not contribute with it.

Any failure of the Contractor to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the Owner, the Engineer and the Construction Manager and their officers, officials, employees, agents or volunteers.

The Contractor shall take out, pay for, and maintain throughout the duration of this Contract and for such additional periods as more specifically required herein the following insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, the Contractor's agents, representatives, employees, subcontractors, suppliers, vendors or materialmen, of any tier.

2.1.1 Commercial General Liability and Automobile Liability Insurance - This insurance shall protect the Contractor from claims for bodily injury, personal injury and property damage which may arise because of the nature of the work or from operations under this Contract. The Commercial General Liability Insurance shall be maintained for one (1) year after final completion and shall provide coverage on an occurrence basis. Coverage shall be at least as broad as ISO forms CG 0001 10 93 and CA 0001 12 93.

- a. **Additional Insureds** - The Commercial General Liability and Automobile Policies of insurance shall include as additional insureds or be endorsed to contain the following provisions: the City of Placerville, the Engineer and Construction Manager, and their officers, officials, employees, agents and volunteers are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor and or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City of Placerville, its officers, officials, employees, agents or volunteers; the Engineer, the Construction Manager and each of their partners, officers, officials, employees, agents and volunteers and coverage provided to such additional insured. This policy shall provide coverage to each of the said insureds with respect to said work. Said policy shall provide primary coverage to the full limit of liability stated in the declarations. If an additional insured endorsement is used, it shall provide coverage as least as broad as either ISO form CG 20 10 11 85 or the combination of CG 20 10 10 01 plus 20 37 10 01.

- b.(1) Amount of Coverage(General Contractor)- The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following limits of liability: \$1,000,000 on account of any one occurrence for bodily injury and property damage, \$1,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than \$5,000,000, and \$5,000,000 products and completed operations aggregate, combined single limit. The Automobile Liability insurance policy shall provide minimum limits of \$1,000,000 per accident for bodily injury and property damage arising out of the ownership, maintenance, or use of any owned or non-owned vehicles. The Commercial General Liability and Automobile Liability Coverages shall include per project aggregates in the above amounts equivalent to ISO form CG 25 03 11 85.
- b.(2) Amount of Coverage (SUBCONTRACTORS LISTED IN PROPOSAL) - The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following limits of liability: \$1,000,000 on account of any one occurrence for bodily injury and property damage, \$1,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than \$5,000,000, and 5,000,000 products and completed operations aggregate, combined single limit. The Automobile Liability insurance policy shall provide minimum limits of \$1,000,000 per accident arising out of the ownership, maintenance, or use of any owned or non-owned vehicles.
- c. Subcontractors – The bodily injury and property damage liability insurance shall not be deemed to require the Contractor to have its subcontractors named as insureds in the Contractor's policy, but the policy shall protect the Contractor from contingent liability which may arise from operations of its subcontractors.
- d. Included Coverage - The above Commercial General Liability insurance shall also include the following coverages:
- Premises - Operations
- Independent Contractors
- Products - Completed Operations
- Personal Injury - (False Arrest, Libel, Wrongful Eviction, etc.)
- Advertising Injury
- Broad Form Property Damage, Including, Completed Operations
- Separation of Insureds/Cross-Liability Provision
- Duty to Defend all Insureds
- Deletion of any Limitation on Coverage for Bodily Injury or Property Damage Arising out of Subsidence or Soil or Earth Movement
- Separate Aggregate - A provision that the annual general aggregate and the products and completed operations annual aggregate shall apply separately to each project for which Contractor provides services away from premises owned by or rented to Contractor.

XCU - (Explosion, Collapse, Underground Damage) XCU may be deleted when not applicable to operations performed by the Contractor or its subcontractors.

Blanket Contractual Liability

- e. Umbrella Policy - Contractor may use an umbrella or excess policy to meet the limits requirement of Section 2.1.1.b(1). However, any such umbrella/excess policy must be approved by the Owner and maintain a A.M. Best Rating of no less than A - :VII.
- f. Professional Liability Coverage - The Engineer shall maintain, for the entire duration of this contract, such errors and omissions insurance as shall protect it from claims based on negligent errors, or omissions, which may arise from the Engineers operations under this contract, whether such operations be by the Engineer or by its employees, subcontractors, consultants or anyone else directly or indirectly employed by any of the foregoing. The amount of this insurance shall not be less than \$1,000,000.

2.1.2 Workers' Compensation Insurance - In accordance with the provisions of Article 5, Chapter 1, Part 7, Division 2 (commencing with Section 1860) and Chapter 4, Part 1, Division 4 (commencing with Section 3700) of the Labor Code of the State of California, the Contractor is required to secure the payment of compensation to its employees and for that purpose obtain and keep in effect adequate Workers' Compensation Insurance. If the Contractor, in the sole discretion of the Owner, satisfies the Owner of the responsibility and capacity under the applicable Workers' Compensation Laws, if any, to act as self-insurer, the Contractor may so act, and in such case, the insurance required by this paragraph need not be provided.

The Contractor is advised of the provisions of Section 3700 of the Labor Code, which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that code, and shall comply with such provisions and have Employers' Liability limits of \$1,000,000 per accident and per employee, and in the aggregate for injury by disease, before commencing the performance of the work of this Contract.

Before the Notice to Proceed with the Work under this Contract is issued, the Contractor shall submit written evidence that the Contractor has obtained for the period of the Contract Workers' Compensation and Employer's Liability Insurance as required for all persons whom it employs or may employ in carrying out the work under this Contract. Such evidence of coverage shall be accompanied by an endorsement from the insurer agreeing to waive all rights of subrogation against the Owner, its officers, officials, employees, agents and volunteers, the Engineer, the Construction Manager and their agents, consultants and employees which might arise by reason of any payment under the policy. This insurance shall be in accordance with the requirements of the most current and applicable State Workers' Compensation Insurance Laws.

2.1.3 Builder's Risk Insurance - Not Required

2.1.4 Contractor's Pollution Legal Liability – Not Required

2.1.5 Proof of Coverage - Before the Notice to Proceed with the Work under this Contract is issued, the Contractor shall furnish the Owner with certificate(s) evidencing issuance of all insurance mentioned herein, copies of the policy declaration or information page(s) and additional insured endorsements. The certificate(s) and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The endorsements are to be on general liability and automobile liability endorsement forms acceptable to the Owner. The certificate(s), policy declaration or information page(s), and endorsements are to be received and approved by the Owner before work commences. Except for the waiver of subrogation rights endorsements, as required under Sections 00800-2.1.2 and 00800-2.1.3, no other endorsements are required for Workers Compensation or Builder's Risk Insurance. Such certificates of insurance shall provide that the insurance policy shall be endorsed to state that coverage shall not be suspended, voided, cancelled by either party, reduced in coverage or limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the Owner. Contractor shall also provide certificate(s) evidencing renewals of all insurance required herein, at least thirty (30) days prior to the expiration date of any such insurance.

Any deductibles or self-insured retentions must be declared to and approved by the Owner. At the option of the Owner, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, the Engineer and the Construction Manager and their officers, officials, employees, agents and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

In the event of the breach of any provision of this paragraph, or in the event of any notices received which indicates any required insurance coverage will be diminished or canceled, Owner, at its option, may, notwithstanding any other provisions of this Agreement to the contrary, immediately declare a material breach of this Agreement and suspend all further work pursuant to this Agreement.

2.1.6 Indemnification

A. Contractor shall indemnify, defend with counsel acceptable to Owner and hold harmless to the full extent permitted by law, Owner, Caltrans, the Engineer and the Construction Manager, and their officers, officials, employees, agents and volunteers, (collectively "the Indemnified Parties"), from and against any and all liability, loss, damage, claims, expenses and costs (including, without limitation, attorney fees and costs and fees of litigation) (collectively, "Liability") of every nature arising out of or in connection with Contractor's performance of the Work or its failure to comply with any of its obligations contained in this Agreement, except such Liability caused by the sole negligence or willful misconduct of the Indemnified Parties. Such indemnification by the Contractor shall include, but not be limited to, the following:

1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the Contractor, its subcontractors, employees, or agents in the performance of the Work, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the Contractor, its employees, or agents;

2. Liability or claims arising directly or indirectly from bodily injury, occupational sickness or disease, or death of the Contractor's, or Supplier's own employees, or agents engaged in the Work resulting in actions brought against the Indemnified Parties;
 3. Liability or claims arising directly or indirectly from or based on the violation of any Laws or Regulations, whether by the Contractor, its subcontractors, employees, or agents;
 4. Liability or claims arising directly or indirectly from the use or manufacture by the Contractor, its subcontractors, employees, or agents in the performance of this Agreement of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, or appliance, unless otherwise specified stipulated in this Agreement.
 5. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the Owner or any other parties by the Contractor, its subcontractors, employees, or agents;
 6. Liability or claims arising directly or indirectly from the willful misconduct of the Contractor, its subcontractors, employees, or agents;
 7. Liability or claims arising directly or indirectly from any breach of the obligations assumed in this Agreement by the Contractor;
 8. Liability or claims arising directly or indirectly from, relating to, or resulting from a hazardous condition created by the Contractor, Subcontractors, Suppliers, or any of their employees or agents, and;
 9. Liability or claims arising directly, or indirectly, or consequentially out of any action, legal or equitable, brought against the Indemnified Parties, their consultants, subconsultants, and the officers, directors, employees, agents and volunteers of each or any of them, to the extent caused by the Contractor's use of any premises acquired by permits, rights of way, or easements, the Site, or any land or area contiguous hereto or its performance of the Work thereon.
 10. Liability arising directly or indirectly from exposure to hazards in violation of the California Labor Code that may be asserted by any person or entity, including, but not limited to, the Contractor, arising out of or in connection with the negligent activities of the Contractor, its agents, employees or privities pursuant to this Contract, whether or not there is concurrent negligence on the part of the Indemnified Parties.
- B. The Contractor shall reimburse the Indemnified Parties for all costs and expenses, (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals and court costs of appeal) incurred by said Indemnified Parties in enforcing the provisions of this Paragraph.
- C. The indemnification obligation under this Section 00800-2.1.6 shall not be limited in any way by any limitation on the amount or type of insurance carried by Contractor or by the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Subcontractor or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- D. Pursuant to California Public Contract Code Section 9201, Owner shall timely notify Contractor of receipt of any third-party claim relating to this Agreement.

- E. The Contractor's obligations pursuant to this provision will survive the expiration or earlier termination of this Contract.
- F. In the event the Contractor enters any agreement with the owners of any adjacent property to enter upon or adjacent to such property for the purpose of performing this contract, the Contractor shall fully indemnify, defend and save harmless such person, firm, or corporation, state or other governmental agency which owns or has any interest in such adjacent property. The form and content of such indemnification agreement shall be approved by the Owner and the City of Placerville prior to commencement of the work on or about such property. Contractor also shall indemnify the Owner, the City of Placerville, the Engineer and the Construction Manager, and their officers, officials, employees, agents and volunteers, as provided above.

2.1.7 Injury or Illness Reports - The Contractor shall furnish the Construction Manager with a copy of the Employer's Report of Injury immediately following any incident requiring the listing of said report on the OSHA Log during the prosecution of the work under this Contract. The Contractor shall also furnish the Construction Manager with a copy of the Employer's Report of injury involving any subcontractor on this project.

2.1.8 Notification of Insurance Companies - The Contractor shall advise all insurance companies to familiarize themselves with all of the Conditions and provisions of this Contract, and they shall waive the right of special notification of any change or modification of this Contract or of extension of time, or of decreased or increased work, or of the cancellation of the Contract, or of any other act or acts by the Indemnified Parties, under the terms of this Contract, and failure to so notify the aforesaid insurance companies of changes shall in no way relieve the insurance companies of their obligation under this Contract.

2.2 Insurance During Guarantee Period

For all work the Contractor or its subcontractors perform during the guarantee period, worker's compensation, and commercial general liability insurance and insurance in the amounts and format required herein, shall remain in force and be maintained for one (1) year after final completion.

2.3 Third Party Insurance Requirements

Contractor shall ensure that the insurance it obtains in accordance therewith complies with all requirements mandated by each permitting agency from whom permits shall be obtained for the Work and any other third parties from whom third party agreements are necessary to perform the Work (collectively, the "Third Party(ies)"). To the extent there is a conflict between the Third Party(ies)'s Insurance Requirements and those set forth by the Owner in Section 00800 - SUPPLEMENTARY GENERAL CONDITIONS, the requirement(s) providing the more protective coverage for both the Owner and the Third Party(ies) shall control and be purchased and maintained by Contractor.

Contractor shall be responsible to determine what insurance requirements exist as a condition precedent to obtaining permit(s) for the Work, if any. Contractor shall be solely responsible for any delay(s) arising from its failure and/or its Subcontractors' failure to timely obtain all required insurance.

All required third party insurance shall be submitted to the Owner at the same time Contractor submits all other contractually required insurance, which is no later than fifteen (15) days after Notice of Award, unless otherwise agreed to in writing by the Owner prior to this deadline.

Bidders are encouraged to contact the applicable local agency(ies) prior to Bid in determining all applicable permits, and related insurance requirements, for this Project.

3.0 SUBSTANTIAL COMPLETION

Substantial Completion of the Project is required by Section 00700. When the Contractor considers the entire Work, or a specific portion of the Work, substantially complete, the Contractor must certify in writing to the Owner that the Work is substantially complete and request that the Owner grant Substantial Completion. Within 5 Working Days, the Owner and the Contractor must inspect the Work to determine the status of completion. If the Owner does not consider the entire Work, or a specific portion of the Work, substantially complete, the Owner will notify the Contractor in writing, giving the Owner's reasons. If the Owner considers the entire Work, or a specific portion of the Work, substantially complete, the Owner will grant substantial completion. The counting of time for liquidated damages will cease for the entire Work, or a specific portion of the Work, on the date substantial completion is granted, but substantial completion does not bind the City to formal acceptance or relieve the Contractor of the responsibility for completing or correcting work. Unless otherwise specified in the Special Provisions, the entire Work, or a specific portion of the Work, will be considered substantially complete when all work depicted on the contract drawings and required by the Contract Documents has been performed, and the Work can be used for its intended purpose. Only minor corrective work will be allowed to be considered as punch list work. The Agency will provide a list of items to be completed or corrected (punch list) before Final Completion. The Contractor must provide the level of effort and resources necessary to complete the punch list within 30 Calendar Days. Unless otherwise agreed to by the Owner, the Owner is authorized to perform the work if the contractor fails to complete the punch list within 30 Calendar Days. Costs incurred by the City to correct defects or deficiencies, including loss of use, inspection and administrative costs, will be deducted from the final project payment via a deductive change order.

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CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

GENERAL REQUIREMENTS

OCTOBER, 2019

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SECTION 01060 REFERENCES

1.0 CODES AND STANDARDS

Whenever reference is made to a code or standard, it means the latest edition in effect the date that the Contract Documents are dated. Where codes, standards and reference documents are referred to in the Contract Documents, the Contractor may submit a written request to the Construction Manager for assistance in locating such documents. Within three days of receipt of such request, the Construction Manager or the Engineer will notify the Contractor as to where the document(s) can be reviewed.

2.0 DEFINITIONS OF WORDS AND TERMS

Where used in the project manual, the following words and terms shall have the meanings indicated. The meanings shall be applicable to the singular, plural, masculine and feminine of the words and terms.

The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by the Owner, Construction Manager or Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of the Owner, Construction Manager or Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Owner, Construction Manager or Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority contrary to the provisions of the Contract Documents.

Acceptance, Final Acceptance: Formal action of the City of Placerville’s City Council in determining that the Contractor’s work has been completed in accordance with the Contract Documents and in notifying the Contractor in writing of the acceptability of the Work.

Acts of God: “Acts of God” shall include only the following occurrences or conditions and effects: earthquakes in excess of a magnitude of 3.5 on the Richter Scale and tidal waves.

Addenda: Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

Agreement: The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

Allowance: “Allowance” shall mean an amount of money set aside under the Contract for a special purpose identified and defined in the Contract Documents.

Application for Payment: The form acceptable to Owner's Representative which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

Asbestos: Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Bid: Offer of a bidder submitted on the prescribed forms setting forth prices of the work to be performed.

Bidder: Any Individual, partnership, corporation, or a combination thereof, includes joint venturers who meet the requirements of the Contract Documents and offer a bid to perform the Work. The term "Successful Bidder" is the lowest responsible Bidder submitting a responsive Bid to whom the Owner (on the basis of Owner's evaluation as provided for in the Contract Documents) makes an award.

Bidding Documents: The Bidding Requirements and the proposed Contract Documents (including all Addenda).

City: Refers to the City of Placerville.

Clarification Letter: A Clarification Letter is issued by the Construction Manager to address the clarification of Contract issues raised by the Construction Manager, Engineer or Owner.

Claim: A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

Completion: The word completion shall indicate substantial completion. See Substantial Completion.

Construction Manager: The person designated, in writing, by the Owner to act as its representative at the construction site and to perform administrative functions relating to this Contract. The Construction Manager may also furnish inspection services as provided by the Contract. All contact by the Contractor with the Owner shall be through the Construction Manager.

Contract: The entire and integrated written agreement between the City and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

Contract Change Order.: A document which is signed as recommended by Owner's Representative, signed by Contractor, and signed by Owner's Director of Technical Services, which authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

Contract Document: The words "Contract Documents" shall mean any or all of the following items, as applicable:

Notice Inviting Bids
Instructions to Bidders
Bid Form and Bid Schedule
Designation of Subcontractors
Agreement
Performance Bond
Payment Bond
Guaranty Bond
General Conditions
Supplementary General Conditions
General Requirements Specifications
Drawings
Addenda, if any
Executed Change Orders, if any
Field Orders
Permits

Each of these items is to be considered by reference as part of the Contract Documents, also referred to as Contract.

Contract Price (also referred to as Contract Amount): The amount payable to the Contractor under the terms and conditions of the Contract based on the price given on the bidding schedule, with adjustments made in accordance with the Contract. The base amount given in the bidding schedule shall be either a lump sum bid or the summation of the unit price bids multiplied by the estimated quantities set forth in the bid form.

Contract Time: The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Construction Manager's written recommendation of final payment.

Contractor: The individual partnership, corporation, or combination thereof including joint venturers who enter into the Contract with the Owner for the performance of the Work. The term "Contractor" means the Contractor or his authorized representative. The term "Contractor" also covers subcontractors, subtier subcontractors, consultants, equipment and material suppliers, and their employees.

Contractor's Plant and Equipment: Equipment, material, supplies, and all other items, except labor, brought onto the site by the Contractor to carry out the Work, but not to be incorporated in the Work.

Corrective Work Item List: List of incomplete items of work, incomplete administrative requirements and items of work which are not in conformance with the Contract, prepared by the Construction Manager and issued to the Contractor as an attachment to the response to the Contractor's notification of Substantial Completion.

County: Refers to the County or Counties where the Project is located.

Days: The word "Days" shall mean calendar days, including legal holidays, Saturdays and Sundays, unless specifically noted otherwise. The day shall be 24 hours measured from midnight to the next midnight.

Defective: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

A. does not conform to the Contract Documents, or

B. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or

C. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with the Contract Documents).

Engineer: The engineer or architect designated by the Owner to have design control over the Work or a specified portion of the Work, acting either directly or through duly authorized representatives. Such representatives shall act within the scope of the particular duties delegated to them. The Engineer may also furnish inspection services as provided by the Contract.

Direct: Action of the Owner or Construction Manager by which the Contractor is ordered to perform or refrain from performing work under the Contract.

Drawings. Also referred to as "Plans": That part of the Contract Documents consisting of the graphical and technical requirements of the Contract as included on the plan sheets. Drawings, or reproductions thereof, show the location, character, dimensions and details of the work to be done. Shop drawings and other Contractor submittals are not Drawings as so defined.

Engineer: The person or firm designated as Engineer with authority is defined in the Contract Documents.

Engineer Field Directive: Written documentation of the actions of the Owner or Construction Manager in directing the Contractor. Also referred to as a Directive.

Field Order: A written instruction given to the Contractor authorizing work that is a change to the scope of work carried out on a time and material basis or a lump sum cost agreed to between Owner and Contractor.

Final Completion: The date when the Work is 100% complete, including completion and acceptance of all punch list corrections, as certified by the Owner.

Final Inspection List: List of materials, equipment, workmanship, or administrative requirements which are not in conformance with the Contract. The list shall be prepared by the Construction Manager and submitted to the Contractor following the Contractor's notice of completion of the Work, including all items on the Punch List.

Furnish: The word "furnish" when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

General Conditions: Documents 00700, SPECIAL PROVISIONS, and 00800, SUPPLEMENTARY CONDITIONS, which form the part of the Contract Documents representing the general clauses that establish how the Project is to be administered.

Hazardous Waste: The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6906) as amended from time to time.

Herein: Refers to information presented in the Contract Documents.

Holidays: Legal holidays shall include the following holidays designated by the Owner: New Year's Day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the day after Thanksgiving and Christmas Day.

Install: The work "install" when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment, complete and ready for intended use.

Laws and Regulations; Laws or Regulations: Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

May: "May," wherever or in whatever manner used, refers to permissive actions.

Milestone: A principal event specified in the Contract Documents relating to an intermediate completion date of a separately identifiable part of the Work or a period of time within which the separately identifiable part of the Work should be performed prior to Substantial Completion of all the Work.

Notice of Award: The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

Notice of Completion: A form signed by the Owner's Representative recommending to the Owner that the Work is 100% complete, including completion and acceptance of all punch list

corrections and fixing the date of the Final Completion. After acceptance of the Work by the Owner's governing Board, the form is signed by the Owner and filed with the County Recorder.

Notice to Proceed: A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

Owner: The word "Owner" refers to the City of Placerville, the governing body of which is termed the "City Council" or "Council". The word "City" shall also mean "Owner".

Owner Representative: The person designated in writing by the Owner to act as its agent on specified matters relating to this Contract. The Owner's Representative is an employee or agent of the Owner who has been designated to represent the Owner.

Paragraph: For reference or citation purposes, a paragraph shall refer to the paragraph, or paragraphs, called out by paragraph number and alphanumeric designator.

Perform: Refer to "Provide."

Person: The term, person, includes firms, companies, corporations, partnerships, and joint ventures.

Plans: See "Drawings."

Progress Schedule: A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

Project: The total construction of which the Work to be provided under the Contract Documents, may be the whole, or a part thereof as indicated elsewhere in the Contract.

Project Manual: The bound documentary information prepared for bidding and constructing the work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the Table of Contents.

Provide: The words "provide" or "perform," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in context clearly requiring an obligation of Contractor, "provide" is implied.

Punch List: List of incomplete items of Work, incomplete administrative requirements and items of Work which are not in conformance with the Contract, prepared by the Construction Manager and issued to the Contractor as an attachment to the Certificate of Substantial Completion.

Request for Information: Also referred to as "Request for Clarification". A Request for Information (RFI) is issued by the Contractor to the Construction Manager requesting additional information necessary to clarify or amplify an item in the Contract Documents that the

Contractor believes is not clearly shown or called for in the Drawings or Specifications or other portions of the Contract Documents, or to address problems which have arisen under field conditions. An RFI is not to be used for request for materials/equipment substitutions or value engineering/cost reduction incentive proposals.

Request For Proposal: A request for a proposed cost made to the Contractor by the Owner to add, delete or change the Work. RFP's shall not be deemed to be directions to proceed with any addition, deletion or change to the Work. RFP's may also be referred to as "Request for Quotation".

Salvage: All items specified to be salvaged shall be carefully removed so as not to damage the item, and neatly stockpiled at the construction site by the Contractor. The exact location to stockpile items shall be determined by the Construction Manager. The Construction Manager shall then make a determination as to which items are to be retained by the Owner. All other items shall be properly disposed of at no additional cost to the Owner.

Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

Schedule of Submittals: A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

Schedule of Values: A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

Shall: Refers to actions entered into by the Contractor or the Owner as a covenant with the other party to do or to perform the action.

Shop Drawings (Submittals): Shop drawings (submittals) are drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier, or distributor and which illustrate some portion of the work.

Shown: Refers to information presented on the drawings, with or without reference to the drawings.

Site: Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

Specifications: That part of the Contract Documents consisting of written descriptions of the technical features of materials, equipment, constructions systems, standards, and workmanship.

Specify: Refers to information described, shown, noted or presented in any manner in any part of the contract.

Standard Drawings, Standard Plans, Standard Specifications: The latest edition of the Standard Drawings, Standard Plans or Standard Specifications referenced in the Contract Documents.

State of California Specifications: The State of California Department of Transportation Standard Specifications in effect at the date of Notice Inviting Bids, Document 00010. Also referred to as State Standard Specifications and Caltrans Standard Specifications.

Stop Notice: A legal remedy for subcontractors and suppliers who contribute to public works, but who are not paid for their work which secures payment from construction funds possessed by the Owner.

Subcontractor: A subcontractor is a person or entity who has a direct contract with the Contractor or a sub-tier subcontractor who has a direct contract with a subcontractor to perform any of the Work associated with the Project. The term subcontractor means a subcontractor or subcontractor's authorized representative. The term subcontractor, does not include any separate contractor or any separate contractor's subcontractors.

Submittals: The information which is specified for submission to the Construction Manager in accordance with the Contract Documents.

Substantial Completion: Sufficient completion of the project or the portion thereof to permit a utilization of the project. Determination of substantial completion is solely at the discretion of the Owner. Substantial completion does not mean complete in accordance with the Contract nor shall substantial completion of all or any part of the project entitle the Contractor to acceptance under the Contract.

Substantial Completion Date: Date when the Owner puts into service, the Project or that portion of the Project that has been determined to be substantially complete.

Sub-subcontractor: A sub-subcontractor is a person or entity who has a direct or indirect contract with a subcontractor to perform any of the Work associated with the Project. The term sub-subcontractor means a sub-subcontractor or an authorized representative thereof, also referred to as sub-tier-subcontractor.

Supplier: A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

Surety: The person, firm, corporation, or organization that joins with the Contractor in assuming the liability for the faithful performance of the Work and for the payment of all obligations pertaining to the Work in accordance with the Contract Documents by issuing the Bonds required by the Contract Documents or by law.

Underground Facilities: All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products,

telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

Unit Price Work: Work to be paid for on the basis of unit prices.

Utility: Public or private fixed works for the transportation of fluids, gasses, power, signals, or communications.

Will: See definition of "Shall".

Work: Any and all obligations, duties, and responsibilities necessary to complete the construction assigned to, or undertaken by, the Contractor pursuant to the Contract Documents including all labor necessary to produce such construction and all materials, equipment, and supplies incorporated or to be incorporated in the construction. Also, the completed construction or parts thereof required to be provided under the Contract Documents.

Work Day: A working day is defined as any day, except Saturdays, Sundays and City Legal Holidays, unless approved by the Owner. Any work scheduled by the Contractor on non-working days (Saturdays, Sundays, and City Legal Holidays) shall be verified and approved by the City at least 72 hours in advance. The City shall be compensated for inspection work, at an hourly rate, for any work on non-working days and for overtime.

3.0 ABBREVIATIONS

- A. Interpret abbreviations by context in which abbreviations are used. Abbreviations for standards and organizations used in the Contract Documents are defined as described in the contract plans and as follows:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
ABC	Associated Air Balance Council
ABPA	Acoustical and Board Products Association
ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ACPA	American Concrete Pipe Association
ADC	Air Diffuser Council
AEIC	Association of Edison Illuminating Companies
AFBMA	Antifriction Bearing Manufacturers Association
AFPA	American Forest & Paper Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AHA	American Hardboard Association
AI	Asphalt Institute

AIA	American Institute of Architects
AIMA	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
AMG	American Masonry Guild
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
AREMA	American Railway Engineers and Maintenance-of-Way Association
ARI	American Refrigeration Institute
ASAH	American Society of Architectural Hardware Consultants
ASCE	American Society of Civil Engineers
ASAH	American Society of Architectural Hardware Consultants
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AVATI	See RTI
AWG	American Wire Gage
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWPB	American Wood Preservers Bureau
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Institute of America (formerly SCPI)
BSI	Building Stone Institute
CAGI	Compressed Air and Gas Institute
CAL/OSHA	State of California Dept. of Industrial Relations, Division of Industrial Safety
CBM	Certified Ballast Manufacturers
CBR	California Bearing Ratio
CDA	Copper Development Association
CI	Chlorine Institute
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CMAA	Crane Manufacturers Association of America
CPSC	U.S. Consumer Products Safety Commission
CRA	California Redwood Association

CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard (U.S. Department of Commerce)
CTI	Cooling Tower Institute
DFPA	Douglas Fir Plywood Association
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
EEI	Edison Electric Institute
EIA	Electronic Industries Association
EJCDC	Engineers' Joint Contract Documents Committee
EPA	Environmental Protection Agency
ETL	Electronic Testing Laboratory
Fed Spec	Federal Specification
FCI	Fluid Controls Institute
FGMA	Flat Glass Marketing Association
FHWA	Federal Highway Administration
FIA	Factory Insurance Association
FM	Factory Mutual Insurance Company
FPS	Fluid Power Society
FS	Federal Specifications
FSA	Fluid Sealing Association
FTI	Facing Tile Institute
GO 95	General Order No. 95 CA PUC rules for overhead electric line construction
HEI	Heat Exchange Institute
HI	Hydraulic Institute
HMI	Hoist Manufacturers Institute
HPMA	Hardwood Plywood Manufacturers Association
HTI	Hand Tools Institute
IAPMO	International Association of Plumbing and Mechanical Officials
I-B-R	Institute of Boiler and Radiator Manufacturers
IEEE	Institute of Electrical and Electronics Engineers
IBC	International Building Code
IES	Illuminating Engineering Society
IFI	Industrial Fasteners Institute
IPCEA	Insulated Power Cable Engineers Association
IRI	Industrial Risk Insurers
ISA	Instrumentation, Systems, and Automation Society

MHI	Materials Handling Institute
MIL	Military Specification
MMA	Monorail Manufacturers Association
MSS	Manufacturers Standardization Society of Valve and Fitting Industry
NAAMM	National Association of Architectural Metals Manufacturers
NACE	NACE International
NAPA	National Asphalt Pavement Association
NBHA	National Builders Hardware Association
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors
NBS	See NIST
NCSPA	National Corrugated Steel Pipe Association
NCMA	National Concrete Masonry Association
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NEMI	National Elevator Manufacturing Industry
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology (formerly NBS)
NLA	National Lime Association
NPC	National Plumbing Code
NPCA	National Paint and Coatings Association
NPT	National Pipe Thread
NRMCA	National Ready Mixed Concrete Association
NSC	National Safety Council
NSF	NSF International (formerly National Sanitation Foundation)
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PUC	California Public Utilities Commission
PS	Product Standard
RIS	Redwood Inspection Service
RTI	Resilient Tile Institute (formerly AVATI)
SAE	Society of Automotive Engineers
SCPRF	Structural Clay Products Research Foundation
SDI	Steel Door Institute

SFPA	Southern Forest Products Association
SI	Système International des Unités (International System of Units)
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPFA	Steel Plate Fabricators Association
SPI	Society of the Plastics Industry
SPTA	Southern Pressure Treaters Association
SSI	Scaffolding and Shoring Institute
SSPC	SSPC: The Society for Protective Coatings
UBC	Uniform Building Code (ICBO)
UL	Underwriters' Laboratories
USBR	U.S. Bureau of Reclamation
VA	Vermiculite Association
WCLA	West Coast Lumberman's Association
WCLIB	West Coast Lumber Inspection Bureau
WEF	Water Environment Federation
WIC	Woodwork Institute of California
WPOA	Western Plumbing Officials Association
WSCP	Western States Clay Products Association
WWPA	Western Wood Products Association

B. Abbreviations used in Specifications are:

a	year or years (metric unit)
A	ampere or amperes
am	ante meridian (before noon)
ac	alternating current
ac-ft	acre-foot or acre-feet
atm	atmosphere
AWG	American Wire Gauge
bbl	barrel or barrels
bd	board
bhp	brake horsepower
bil gal	billion gallons
BOD	biochemical oxygen demand
Btu	British thermal unit or units
Btuh	British thermal units per hour
bu	bushel or bushels

C	degrees Celsius
cal	calorie or calories
cap	capita
cd	candela or candelas
cfm	cubic feet per minute
Ci	curie or curies
cm	centimeter or centimeters
cmu	concrete masonry unit
CO	carbon monoxide
Co.	Company
CO2	carbon dioxide
COD	chemical oxygen demand
Corp.	Corporation
counts/min	counts per minute
cu	cubic
cu cm	cubic centimeter or centimeters
cu ft	cubic foot or feet
cu ft/day	cubic feet per day
cu ft/hr	cubic feet per hour
cu ft/min	cubic feet per minute
cu ft/sec	cubic feet per second
cu in	cubic inch or inches
cu m	cubic meter or meters
cu yd	cubic yard or yards
d	day (metric units)
day	day (English units)
db	decibels
DB	dry bulb (temperature)
dc	direct current
diam	diameter
DO	dissolved oxygen
DS	dissolved solids
emf	electromotive force
fpm	feet per minute
F	degrees Fahrenheit ft feet or foot
fc	foot-candle or foot candles
ft/day	feet per day
ft/hr	feet per hour
ft/min	feet per minute
ft/sec	feet per second

g	gram or grams
G	gravitational force gal gallon or gallons
gal/day	gallons per day
gal/min	gallons per minutes
gal/sec	gallons per second
g/L	grams per liter
gpd	gallons per day
gpd/ac	gallons per day per acre
gpd/cap	gallons per day per capita
gpd/sq ft	gallons per day per square foot
gph	gallons per hour
gpm	gallons per minute
gps	gallons per second

h	hour or hours (metric units)
ha	hectare or hectares
hp	high point
hp	horsepower
hp-hr	horsepower-hour or horsepower-hours
hr	hour or hours (English units)
Hz	hertz

ID	inside diameter
ihp	indicated horsepower
Inc.	Incorporated
inch	inch
inches	inches
inches/sec	inches per second
J	joule or joules
k	kips
K	kelvin
K	thermal conductivity
kcal	kilocalorie or kilocalories
kcmil	thousand circular mils
kg	kilogram or kilograms
km	kilometer or kilometers
kN	kilonewton or kilonewtons
kPa	kilopascal or kilopascals
ksi	kips per square inch
kV	kilovolt or kilovolts
kVA	kilovolt-ampere or kilovolt-amperes
kW	kilowatt or kilowatts
kWh	kilowatt hour

L	liter or liters
lb/1000 cu ft	pounds per thousand cubic foot
lb/acre-ft	pounds per acre-foot
lb/ac	pounds per acre
lb/cu ft	pounds per cubic foot
lb/day/cu ft	pounds per day per cubic foot
lb/day/acre	pounds per day per acre
lb/sq ft	pounds per square foot
lin	linear, lineal
lin ft	linear foot or feet
lm	lumen or lumens
log	logarithm (common)
ln	logarithm (natural)
lx	lux
m	meter or meters
M	molar (concentration)
mA	milliampere or milliamperes
max	maximum
mCi	millicurie or millicuries
meq	milliequivalent
μF	microfarad or microfarads
MFBM	thousand feet board measure
mfr	manufacturer
mg	milligram or milligrams
mgd/ac	million gallons per day per acre
mgd	million gallons per day
mg/L	milligrams per liter
μg/L	micrograms per liter
μm	micrometer or micrometers
mile	mile
mil. gal	million gallons
miles	miles
min	minimum
min	minute or minutes
MLSS	mixed liquor suspended solids
MLVSS	mixed liquor volatile suspended solids
mm	millimeter or millimeters
mol wt	molecular weight
mol	mole
Mpa	megapascal or megapascals
mph	miles per hour
MPN	most probable number
mR	milliroentgen or milliroentgens

Mrad	megarad or megarads
mV	millivolt or millivolts
MW	megawatt or megawatts
N	newton or newtons
N	normal (concentration)
No.	number
Nos	numbers
NRC	noise reduction coefficient
NTU or ntu	Nephelometric Turbidity Units
oc	on center
OD	outside diameter
ORP	oxidation-reduction potential
OT	ortho-tolidine
OTA	ortha-tolidine-arsenite
oz	ounce or ounces
oz/sq ft	ounces per square foot
Pa	pascal or pascals
pl	plate or property line
pm	post meridiem (afternoon)
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand pr pair
psf/hr	pounds per square foot per hour
psf	pounds per square foot
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PVC	polyvinyl chloride
qt	quart or quarts
R	radius
R	roentgen or roentgens
rad	radiation absorbed dose
RH	relative humidity
rpm	revolutions per minute
rps	revolutions per second
s	second (metric units)
S	Siemens (mho)

SDI	sludge density index
sec	second (English units)
SI	International System of Units
sp	static pressure
sp gr	specific gravity
sp ht	specific heat
sq	square
cm ² or sq cm	square centimeter or centimeters
sq ft	square feet or foot
sq inch	square inch
sq inches	square inches
km ² or sq km	square kilometer or kilometers
m ² or sq m	square meter or meters
mm ² or sq mm	square millimeter or millimeters
sq yd	square yard or yards
SS	suspended solids
STC	Sound Transmission Class
SVI	sludge volume index
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TLM	median tolerance limit
TOC	total organic carbon
TOD	total oxygen demand
TOW	top of weir
TS	total solids
TSS	total suspended solids
TVS	total volatile solids
U	U Factor/U Value
U	Coefficient of Heat Transfer
U	heat transfer coefficient
UNS	Uniform Numbering System
US	United States
V	volt or volts
VA	volt-ampere or volt-amperes
W	watt or watts
WB	wet bulb
wg	water gauge
wk	week or weeks
wt	weight

yd	yard or yards
yr	year or years (English unit)

C. Abbreviations used on Drawings: As listed on Drawings or in Specifications.

D. Symbols used in Specifications:

:	“shall be” or “shall”-where listed within sentences or paragraphs
#1	Number
1#	Pound
&	And
%	Percent
C	Centigrade
F	Fahrenheit
°	Degree
/	per, except where used to combine words; example: power/fuel, and in that case it means and
“	Inch (inches)
‘	foot (feet)
@	At
©	Copyright
®	Registered
™	Trademark
±	Plus and Minus tolerance
≠	not equal to

E. Symbols, used only on Drawings, are indicated thereon.

*****END OF SECTION*****

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**SECTION 01090
REGULATORY REQUIREMENTS AND PERMITS**

1.0 APPLICABLE CODES

See Technical Specifications for Applicable Codes.

2.0 FEES AND PERMITS

2.1 Summary

Contractor shall comply with all the terms, conditions and requirements attached to all permits, bonds and licenses required by any local, state, or federal agencies to perform work, construct, erect, test and start up of any equipment or facility for this Contract. The Contractor shall give all notices necessary and incidental to the due and lawful prosecution of the Work.

Any permits, bonds, licenses and fees therefore required for the performance of work under this Contract and not specifically mentioned herein as being obtained and paid for by the Owner shall be included in the Contractor's Bid price. The Contractor shall apply for and obtain all safety permits for excavations, tunneling, trenches, construction (building structure, scaffolding, or falsework) and demolition required by CAL/OSHA.

The Contractor shall post at the site of Work all required permits as stipulated by the respective regulatory agency.

2.2 Local Agency and Building Code Fees and Permits

The Owner is not responsible for any local agency or utility permits required for temporary facilities during construction such as field office trailers and temporary electrical service for construction operations. Obtaining all such permits and the costs associated with such permits are the responsibility of the Contractor and shall be included in the Contractor's Bid Price.

2.3 Encroachment Permit

The Contractor is responsible for preparing, having approved, and implementing a project TCP and being in compliance with all other provisions required by the City encroachment permit. The traffic control plan shall be prepared by the Contractor and will require City Approval. Refer to Section 2060 regarding submittal for traffic control plans. The Contractor is also made aware that the project will require the Contractor to apply for a City encroachment permit. Fees will be waived; however, all conditions of the permit will apply.

2.4 Construction Water

Contractor must obtain a water use permit for construction water from the City of Placerville, and be responsible for obtaining a construction meter from the City and paying the construction meter deposit fee of one thousand twenty-five dollars (\$1,025). The monthly rental fee and usage fee will be waived provided the contractor, at the City's opinion, utilizes the construction water beneficially and for the sole purpose of the project.

3.0 STORM WATER QUALITY CONTROLS

3.1 General

The 1972 amendments to the Federal Water Pollution Control Act established the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges of pollutants from point sources. The 1987 amendments to the Clean Water Act (CWA) created a new section of the CWA devoted to storm water permitting (Section 402(p)). The EPA has delegated permitting authority to the State Water Resources Control Board (SWRCB). The SWRCB issues both general and individual permits. Construction activities are regulated under the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) provided the total amount of ground disturbance during construction is greater than or equal to 1 (one) acre. The appropriate Regional Water Quality Control Board (RWQCB) enforces the General Permit. Coverage under a General Permit requires the submission of a Notice of Intent (NOI) with the appropriate fee, annual compliance reports, a Notice of Termination (NOT) and preparation of a storm water pollution prevention plan (SWPPP).

Construction activity includes, but is not limited to: clearing, grading, demolition, and excavation, construction of new structures, pipelines and reconstruction of existing facilities involving removal and replacement that results in soil disturbance. This includes construction access roads, staging areas, storage areas, stockpiles, and any off-site areas which receive run-off from the construction project such as discharge points into a receiving water.

If a violation of the permit is due to the Contractor's actions or inactions and a fine is assessed, the Contractor shall be responsible for the fine.

3.2 Projects Disturbing Less Than 1-Acre

This project has been determined by the Owner to disturb less than 1-acre; therefore, a NOI, SWPPP, and NOT are not required. The Contractor shall comply with the following requirements for projects disturbing less than 1-acre.

3.2.1 General – the Contractor shall perform water pollution control work in conformance with the requirements in the Section 303 of the Clean Water Act, the Water Quality Control Plan for the Sacramento River Basin (Central Valley Regional Water Control Board 1998) and in the El Dorado County Stormwater Quality Ordinance.

Before the start of job site activities, the Contractor shall provide training for project managers, supervisory personnel, and employees involved with water pollution control work. The training shall include:

- A. Rules and regulation
- B. Implementation and maintenance for:
 - 1. Temporary Soil Stabilization
 - 2. Temporary Sediment Control
 - 3. Tracking Control
 - 4. Wind Erosion Control

The Contractor shall designate in writing a Water Pollution Control Manager (WPCM). The Contractor shall submit a statement of qualifications describing the training, work history, and expertise of the proposed WPCM. The qualifications shall include either:

- A. Must have attended State Water Resources Control Board sponsored or approved Qualified SWPPP Practitioner training as described at State Water Resources Control Board web site.
- B. Certification as a Certified Professional in Erosion and Sediment Control (CPESC).

The WPCM shall be:

- A. Responsible for water pollution control work.
- B. The primary contact for water pollution control work.
- C. Have authority to mobilize crews to make immediate repairs to water pollution control practices.

The Contractor may designate one manager to prepare the Water Pollution Control Program (WPCP) and a different manager to implement the plan. The WPCP preparer shall meet the training requirements for the WPCM.

3.2.2 Water Pollution Control Program – The Contractor shall submit a Water Pollution Control Program (WPCP) to the Owner for approval. The WPCP shall conform to the requirements in the Clean Water Act and these special provisions.

The WPCP shall include water pollution control practices:

- A. For storm water and non-storm water from areas outside of the job site related to construction activities for the contract such as:
 - 1. Staging areas
 - 2. Storage yards
 - 3. Access roads
- B. Appropriate for each season as described in "Implementation Requirements" of these special provisions.

The WPCP shall include a schedule that:

- A. Describes when work activities that could cause water pollution will be performed.
- B. Identifies soil stabilization and sediment control practices for disturbed soil area.
- C. Includes dates when these practices will be 25, 50, and 100 percent complete.
- D. Shows 100 percent completion of these practices before the rainy season.

The WPCP shall include the following water pollution control practices and their associated contract items of work as shown on the plans or specified in these special provisions:

- A. Temporary Soil Stabilization
- B. Temporary Sediment Control
- C. Tracking Control
 - 1. Stabilized Construction Entrance/Exit
- D. Wind Erosion Control
- E. Non-Storm Water Management
- F. Waste Management and Materials Pollution Control
 - 1. Concrete Waste Management
- G. Final Stabilization Measures

Within 5 days after contract approval, the Contractor shall submit 2 copies of the WPCP to the Owner. The Contractor shall allow 5 days for the Owner's review. If revisions are required, the Owner will provide comments and specify the date that the review stopped. The Contractor shall revise and resubmit the WPCP within 5 days of receipt of the Owner's comments. The Owner's review will resume when the complete WPCP is resubmitted. When the Owner approves the WPCP, the Contractor shall submit 3 copies of the approved WPCP to the Owner. The Contractor may proceed with construction activities if the Owner conditionally approves the WPCP while minor revisions are being completed.

The Contractor shall not perform work that may cause water pollution until the WPCP has been approved by the Owner. The Owner's review and approval shall not waive any contract requirements and shall not relieve the Contractor from complying with Federal, State and local laws, regulations, and requirements.

If there is a change in construction schedule or activities, the Contractor shall prepare an amendment to the WPCP to identify additional or revised water pollution control practices. The Contractor shall submit the amendment to the Owner for review within a time agreed to by the Owner not to exceed the number of days specified for the initial submittal of the

WPCP. The Owner will review the amendment within the same time allotted for the review of the initial submittal of the WPCP.

If directed by the Owner or requested in writing by the Contractor and approved by the Owner, changes to the water pollution control work specified in these special provisions will be allowed. Changes may include addition of new water pollution control practices. The Contractor shall incorporate these changes in the WPCP. No additional compensation will be made by the Owner for modifications and/or additions to the WPCP.

The Contractor shall keep a copy of the approved WPCP at the job site. The WPCP shall be made available when requested by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency, or the local storm water management agency. Requests from the public shall be directed to the Owner.

3.2.3 Implementation Requirements – The Contractor's responsibility for WPCP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Standard Specifications 13-2.

If the Contractor or the Owner identifies a deficiency in the implementation of the approved WPCP, the deficiency shall be corrected immediately, unless an agreed date for correction is approved in writing by the Owner. The deficiency shall be corrected before the onset of precipitation. If the Contractor fails to correct the deficiency by the agreed date or before the onset of precipitation, the Department may correct the deficiency and deduct the cost of correcting deficiencies from payments.

3.2.3.1 Year Round – The Contractor shall monitor the National Weather Service weather forecast on a daily basis during the contract. The Contractor may use an alternative weather forecasting service if approved by the Owner. Appropriate water pollution control practices shall be in place before precipitation.

The Contractor may discontinue earthwork operations for a disturbed area for up to 21 days and the disturbed soil area will still be considered active. When earthwork operations in the disturbed area have been completed, the Contractor shall implement appropriate water pollution control practices within 15 days or before predicted precipitation, whichever occurs first.

3.2.3.2 Rainy Season – Soil stabilization and sediment control practices conforming to these special provisions shall be in place during the rainy season between October 15 and April 15.

The Contractor shall implement soil stabilization and sediment control practices a minimum of 10 days before the start of the rainy season.

3.2.4 Inspection and Maintenance – The WPCM shall inspect the water pollution control practices identified in the WPCP as follows:

- A. Before a forecasted storm,
- B. After precipitation that causes site runoff,
- C. At 24-hour intervals during extended precipitation,

- D. On a predetermined schedule, a minimum of once every 2 weeks outside of the defined rainy season, and
- E. On a predetermined schedule, a minimum of once a week during the defined rainy season.

The WPCM shall oversee the maintenance of the water pollution control practices.

The WPCM shall use the Storm Water Quality Construction Site Inspection Checklist provided in the Preparation Manual or an alternative inspection checklist provided by the Owner. A copy of the completed site inspection checklist shall be submitted to the Owner within 24 hours of finishing the inspection.

3.2.5 Reporting Requirements – If the Contractor identifies discharges into surface waters or drainage systems causing or potentially causing pollution or if the project receives a written notice or order from a regulatory agency, the Contractor shall immediately inform the Owner. The Contractor shall submit a written report to the Owner within 7 days of the discharge, notice, or order. The report shall include the following information:

- A. The date, time, location, and nature of the operation, type of discharge and quantity, and the cause of the notice or order.
- B. The water pollution control practices used before the discharge, or before receiving the notice or order.
- C. The date of placement and type of additional or altered water pollution control practices placed after the discharge or after receiving the notice or order.
- D. A maintenance schedule for affected water pollution control practices.

4.0 DEWATERING

Construction dewatering in El Dorado County is regulated by the California Regional Water Quality Control Board - Central Valley Region. In May of 2013, the Central Valley Region adopted Waste Discharge Requirements Order No. r5-2013-0074 and National Pollutant Discharge Elimination System (NPDES) Permit No. CAG995001 to regulate construction dewatering. Should the Contractor need to control groundwater by dewatering, depressurization of water bearing soil and rock formations, dispose of testing/flushing water and/or dewater the pipeline for abandonments or tie-in purposes the Contractor must apply for coverage under and comply with this NPDES Permit, or any updated NPDES Permit, and all other laws and regulations having jurisdiction over construction dewatering. The Contractor is responsible for obtaining all permits from agencies with control over all dewatering matters including well installation/abandonment, water discharge, use of existing storm drains and natural water sources. Contractor can download a complete copy of Order No. r5-2013-0074 on the internet site:

http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0074.pdf

The Contractor will be held responsible for any fines or penalties from regulatory agencies resulting from its dewatering system.

Before dewatering is commenced, the Contractor shall obtain acceptance of the City Representative for the method, installation, monitoring, testing, removal, discharge point(s) and other system details of the Contractor's proposed dewatering system. To that end, the

Contractor is to submit to the City Representative a complete dewatering plan prepared and signed by a Professional Engineer registered in California.

*****END OF SECTION*****

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SECTION 01110 SUMMARY OF WORK

1.0 THE WORK COVERED BY THE CONTRACT DOCUMENTS

- A. Construction and Construction and completion of approximately 1,472 LF of 8-inch water main, 188 LF of 4-inch water main, 14 residential services and meters, 4 fire hydrants, 2-inch dead-end blow-off, water sampling station, abandonment of the existing 6-inch water main, 38 LF of 6-inch sewer main, 4 cast-in-place sewer manholes, and 1,403 LF of cast-in-place-pipe (CIPP) sewer pipe lining in a minor arterial City street. Work includes, but is not limited to: soil excavation, rock excavation, backfilling, concrete, pipefitting, pipe abandonment, manhole and drain inlet removal, pressure testing, disinfection, connections to existing City facilities, site restoration, patch paving and trench paving, and traffic control, and all other work required in the Contract drawings. The contractor shall be Class "A" licensed.
- B. The Contractor shall provide all labor, superintendence, materials, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies, services, and other means of construction necessary or proper for performing and completing the Work specified in the Contract Documents. The Contractor shall perform and complete the work in the best manners that promote rapid and efficient construction activities consistent with safety of life and property, to the satisfaction of the Construction Manager, and in strict accordance with the Contract Documents.
- C. The Contractor shall comply with all codes, ordinances, regulations, orders, and other legal requirements of public authorities having bearing on the performance of the Work.

2.0 LOCATION OF PROJECT

- A. The Work is located in the City of Placerville, California, 95667, on Mosquito Road between Clay Street and the City Limit, as identified in the contract drawings.

3.0 OWNER ASSIGNED SUBCONTRACTORS AND EQUIPMENT SUPPLIERS

- A. Assignment of Subcontractors and Equipment Suppliers by Owner is not anticipated.

4.0 OWNER FURNISHED EQUIPMENT

- A. OWNER will furnish the following products:
 - 1. 2 – Aluminum construction notification signs to be install per Bid Item 2.
 - 2. The City will provide the contractor with 14 - 1" Sensus SR11 water meters, 13 – 1" Watts 1LF25AVB brass pressure regulating valves, and 27 precast B-16 concrete

meter vaults with iron ported lids or traffic rated lids, as required, to be installed per the construction plans with Bid Items 16, 18, & 19.

5.0 ACTIVITIES BY OTHERS

- A. Owner, utilities, and others may perform activities within Project area while the Work is in progress.
 - 1. Schedule the Work with Owner, utilities, and others to minimize mutual interference.
- B. Activities by others which may affect performance of work include:
 - 1. Normal daily operation of the existing facilities by Owner's personnel.
- C. Cooperate with others to minimize interference and delays.
 - 1. When cooperation fails, submit recommendations and perform Work in coordination with work of others as directed.

6.0 COORDINATION OF WORK

- A. Maintain overall coordination of the Work.
- B. Obtain construction schedules from each subcontractor, and require each subcontractor to maintain schedules and coordinate modifications.

7.0 CONTRACTOR STAGING AREAS

- A. The Contractor shall stage at City owned property 2950 Mosquito Road.
- B. Contractor is responsible for all stormwater pollution control measures required for staging areas.
- C. The Contractor shall take pre-construction photos of the staging area and is required to restore the staging area to pre-construction conditions prior to payment for demobilization.

*****END OF SECTION*****

SECTION 01140 WORK RESTRICTIONS

1.0 GENERAL SEQUENCING AND CONSTRAINTS

- A. Work Sequence and Constraints described hereinafter are critical events in work sequence which are presented to underscore the importance of proper sequencing, scheduling and coordination. The work sequence and constraints presented do not describe all items affecting the completion of the Work, but are intended to describe important events necessary to minimize disruption of the existing facilities.

2.0 INTERRUPTION OF WATER SUPPLY

2.1 General Requirements

- A. The Work shall be bid, scheduled and constructed in such a manner as to result in the least possible disruption to the existing customers. No customer shall have their water service disrupted for more than four (4) hours a day and for no more than two (2) consecutive days or two (2) total days. Water service shall be restored to all customers by the end of each work day. Modifications that affect or may affect the water supply to the existing customers shall not be made without first obtaining written or explicit verbal permission from the City Representative.

In the event the Contractor's efforts to re-establish permanent potable water service to a property exceed the time constraints above, the contractor shall be responsible for providing a reliable potable water source to that property at no additional cost to the City or the property owner until the permanent potable water service can be re-established.

The Contractor shall provide adequate temporary pumping and piping facilities to properly clear the work areas as necessary of water and/or and sewage (in the event of a sewer service or main break). The Contractor shall clean the work areas as required to perform the work.

Shutdown and isolation of existing facilities by closing existing valves/gates, or as specifically provided for in the Contract Documents, will be performed by City personnel unless otherwise authorized by the City. All shutdown and/or isolation of existing facilities shall be scheduled a minimum of two (2) business days in advance of needing the City's assistance. The City may authorize the Contractor the flexibility of operating the City facility provided the Contractor has employed a State certified D1 operator who has demonstrated to the City Engineer and Operations manager they are competent in operating the City's facility. The Contractor shall submit the D1 operator's documentation to the City for review and approval. Note that 100% shut off may not be possible due to the age of existing valves. Contractor shall provide adequate temporary pumping, storage, piping, and disposal of such water in order to complete the work.

Prior to any shutdown all materials, fittings, supports, equipment and tools shall be

on the site and all necessary skilled labor scheduled prior to starting any connection work.

Planned utility service shutdowns to any service shall be accomplished during periods of minimum use. In some cases this will require night or weekend work, which shall be at no additional cost to the City. The Contractor shall program work so that service will be restored in the minimum possible time and shall cooperate with the City and utility owner in reducing shutdowns of the utility to a minimum. No utility shall be disconnected without prior written approval from the utility Owner and City Representative. When it is necessary to disconnect a utility, the Contractor shall give at least two (2) weeks' notice to the utility Owner and to the City Representative for approval of the proposed schedule.

The Contractor shall note that only certain structures, tie-ins and constraints are addressed in this section. All work, whether or not addressed here, shall be governed by applicable parts of this section, and schedules and procedures further submitted for approval.

2.2 Outage Submittal Requirements

- A. The Contractor shall submit to the City Representative a detailed outage plan and time schedule for operations at least two (2) weeks prior to the need for outage. Note that this will require a significant effort, including meeting with each affected customer (if necessary) and the City Inspector to discuss the planned outage time frames and their individual needs.

The detailed plan shall meet the restrictions and conditions found in the Contract Documents. The outage plans shall be coordinated with the construction schedule and shall meet the Contractor's planned method; the length of time required to complete said operation. In addition, the outage plan shall describe the Contractor's contingency plan that shall be initiated in the event that its temporary facilities fail or it becomes apparent that the time constraints described in the approved outage plan cannot be met. The contingency plan shall conform to all specified outage requirements. All costs for preparing and implementing both the outage and contingency plans shall be borne by the Contractor.

If a meeting is requested by any Utility Owner, the Contractor shall attend a meeting with the City Representative and Utility Owner one (1) week before the scheduled outage to review the plan. Any changes to the plan must be approved by the City Representative prior to the outage.

2.3 Property Owner Notification

- A. The Contractor shall produce, print, and distribute door hangers and/or mailers a minimum of ten (10) working days and again twenty-four (24) hours in advance of performing the water service line cross-over to the new service line. Contractor shall submit samples of the notifications to the City for approval. At a minimum, the notification shall be printed on the Contractor's letter head, include the Contractor Foreman's contact number, the schedule (days and hours) when the work will be performed and water service outage will occur, and possible

expectations when the new service is activated (e.g. higher pressure and need to clean faucet screens). No additional compensation will be made for notification reproduction and distribution cost should the Contractor's schedule change.

2.4 Work Constraints, Sequencing and Planned System Outages Specific to this Project

- A. Contractor shall provide adequate time within their schedule to apply for and obtain approval of the City construction encroachment permit for work within the Contract area.

Contractor shall coordinate all work on private property with the property Owner and the City Representative. The Contractor shall be responsible for coordinating with each property Owner. Contractor shall ensure that access to the property for the Owner is maintained at all times. For properties where the landscape or structures (including concrete driveways) are disturbed during placement or relocation of a water meter, residential pressure regulator, or service reconnection, the Contractor shall return all disturbed landscape and structures to original condition. If any shrubs or trees are affected, every effort shall be made to preserve the existing plant and replant it. If unable to do so, the Contractor shall provide a similar plant in coordination with the property Owner and City Representative. This restoration work shall be done before moving on to another location.

All property restoration shall be done to the reasonable satisfaction of the property Owner. The contractor is responsible for providing proof of property Owner satisfaction prior to substantial completion of the project (signatures shall be provided).

Contractor shall ensure that access is provided to property Owners at all times and that every effort is made to minimize delays to property Owners. The Contractor shall coordinate their schedule to provide for continuous bus access, delivery of mail and packages and garbage pickup, as well as emergency services.

2.5 Work By Others

- A. Only City personnel shall operate existing water valves unless otherwise directed.

In the event of a utility break (such as gas, electric, phone, cable, sewer or other) the Contractor shall immediately contact the utility to coordinate inspection and repair of the damaged facility. The Owner of the respective utility must be contacted and approve of any repairs made.

3.0 OTHER WORK RESTRICTIONS AND COORDINATION REQUIREMENTS

3.1 Work Hours

- A. Work hours shall conform to all applicable Federal, State, County, and local laws, ordinances, and codes applicable to the work. Where any of these laws are in conflict, the more stringent requirements shall be followed.

All work shall be performed during the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday. This restriction includes deliveries of materials and equipment and servicing of construction equipment on the project site. Any work outside this time frame shall be allowed only with prior written permission from the City's Representative. The actual time the City's personnel, City Representative or Engineer spend working outside this time frame shall be billed to the Contractor at the personnel's standard charge out rate. Any work designated to have a special time frame shall be so noted on the Plans and/or elsewhere in these Specifications and shall be excluded from this reimbursement.

Should the Contractor perform work outside of the standard hours, Monday through Friday without the City's written permission, the City will charge the Contractor, as a penalty, five hundred dollars (\$500.00) for each infraction. This charge will be deducted from the next progress payment due Contractor.

Each and every day the Contractor is not going to perform any work, the Contractor shall by 9:00 a.m. review the entire site, considering all situations, and leave a message at the City that the site has been reviewed and the site is secure. Should any mitigation be necessary, the Contractor should also advise the City.

3.2 Existing Utilities

- A. A minimum of 48 hours in advance of excavation activities, the Contractor shall contact the following parties to ascertain and verify the existence and location of utility lines and facilities and shall coordinate all work in accordance with the information obtained from such inquiries in order to prevent damage to such lines and facilities:

Underground Service Alert (USA) (1-800-642-2444)

Prior to conducting any excavation, the Contractor shall contact the appropriate regional notification center as required by Government Code Section 4216. In accordance with Government Code Section 4215, the Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating existing main or trunk line utility facilities not indicated in the Contract Plans and Specifications with reasonable accuracy, and for the equipment on the project necessarily idled during such work; provided that the Contractor shall first notify the Agency before commencing work on locating, repairing damage to, removing or relocating such utilities.

All sewer crossings shall conform to the State Health Department regulations for water/sewer separation and materials. Cost for special pipeline materials to meet Health Department regulations, and repair of services damaged shall be included in the cost of the bid items to which the work is appurtenant. No separate payment will be made.

The Engineer or his representative has endeavored to determine the existence of utilities at the work site from the records of the Owners of known utilities in the vicinity of the work. The positions of these utilities, as derived from such records,

are shown on the Plans. The service connections to these utilities may not be shown on the Plans.

The Contractor shall make his own investigations, including exploratory excavations, to determine the locations and type of existing service laterals or appurtenances when their presence can be inferred from the presence of other visible facilities, such as buildings, meters and junction boxes, on or adjacent to the work site.

3.3 Trench Excavation

- A. In all public areas, the maximum length of trench excavation opened shall not exceed 200-feet or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is greater. No trench in public areas shall be left open at night or during periods when the Contractor is not at the site of work. Trenches in these areas shall either be backfilled and temporarily paved, where applicable, or covered with steel trench plates as required by the City. Use of trench plates shall be kept to a minimum in order to allow for the subsequent continuation of work. No more than two trench plates are to be used at one time. All other areas to be backfilled on a daily basis.

3.4 Final Pavement

- A. In the event that final pavement and/or the overlay cannot be performed by October and/or the City of Placerville determines that temperatures are not adequate the Contractor shall provide paving the following Spring at no additional cost to the City.

*****END OF SECTION*****

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SECTION 01160 FIELD ENGINEERING

1.0 DATUM

- A. Vertical and horizontal datum are based on the coordinates and benchmarks shown on the Drawings or as provided by Owner prior to the start of construction. The Contractor is to locate and protect Owner furnished control points prior to starting the Work and preserve control points during construction. The Contractor shall re-establish all control points disturbed by its operations at no cost to Owner.
- B. The Contractor shall establish other vertical and horizontal control from these Owner furnished reference points as required to properly layout and construct the Work. All connections shall be installed based on actual elevations of existing structures to which connections are made.
- C. The Contractor's layout shall be based upon existing structures and the vertical and horizontal datum established by the Owner.
- D. The Contractor shall be responsible for the preservation of all existing survey monuments or permanent bench marks. Any monuments or bench marks disturbed or destroyed by Contractor shall be referenced and replaced by a licensed land surveyor. A corner record or record of survey, as appropriate, shall be filed by the licensed land surveyor as required by the Land Surveyor's Act with the appropriate local government agencies.

2.0 QUALITY ASSURANCE

- A. The Contractor's Surveyor shall be a land surveyor registered in California or civil engineer qualified and licensed in California with at least five (5) years surveying experience of similar projects.
- B. Dimensions for all existing structures, piping, paving, and other nonstructural items are taken from the available information during the Owner's planning and design. The Contractor shall field verify all dimensions and conditions in advance of any construction in the area. Any discrepancy between the field survey by the Contractor and the information indicated in the Contract Documents shall be immediately brought to Construction Manager's attention by written notification. In all questions arising as to proper location of lines and grades, the Construction Manager's decision will be final.
- C. Accuracy of the Contractor's stakes, alignments and grades may be periodically and randomly checked by the Construction Manager. If requested by Construction Manager, the Contractor shall supply field labor as required, at no extra charge to Owner, to aid and assist the Construction Manager in checking location and grades of the work as set by the Contractor. This shall include postponing parts of the Work affected by survey check, moving materials and equipment that interfere with a clear line of sight between horizontal control points and the construction work. The

Contractor is not to assume that Construction Manager's check substitutes or complements the Contractor's required field quality control procedures.

- D. The Contractor's registered land surveyor to check the line and grade of the slab or footing concrete forms prior to the first slab or footing pour at each structure and building.

3.0 PROJECT SURVEY REQUIREMENTS

- A. The City of Placerville will contract to conduct the initial construction staking of the pipeline alignment; trench width and pavement limits; locations of reducers, fire hydrants and 2-inch dead-end blow-off; new cast-in-place sewer manhole locations, and tie-in connections to existing system. Upon award, Contractor shall review initial construction staking and provide additional construction staking as determined necessary and agreed to by the City. The City may conduct one (1) additional construction staking effort based on what was agreed upon.
- B. The Contractor shall be solely responsible for all cost and effort to provided additional construction staking and survey should the Contractor determine it necessary to complete Contract work after the City completed their follow-up construction staking effort. The Contractor shall be responsible for protecting and preserving the construction staking and survey throughout the Contract duration; maintaining alignment, elevation, and grade, as indicated on the Drawings and as required for the proper operation and function.

3.1 SUBMITTALS

- A. Contractor to furnish Construction Manager one copy of all land surveyor notes, calculations, sketches and drawings within 48 hours after completion of each survey task.

4.0 RECORD DOCUMENTS

- A. The Contractor is to prepare, maintain and submit Record Documents as specified in SECTION 01770- **CLOSEOUT PROCEDURES**. The Contractor's land surveyor is to affix his signature and registration number to applicable record drawings certifying the accuracy of lines and grades shown.

*****END OF SECTION*****

**SECTION 01200
MEASUREMENT AND PAYMENT**

1.0 MEASUREMENT AND PAYMENT

1.1 General

- A. Measurements of the completed work shall be in accordance with, and by instruments and devices calibrated to United States Standard Measures and the units of measurement for payment, and the limits thereof, shall be made as shown on the Plans, Specifications, Special Provisions (General Conditions), and Supplementary Conditions.

1.2 Units of Measurement

- A. Measurements shall be in accordance with U.S. Standard Measures. A pound is an avoirdupois pound. A ton is 2,000 pounds avoirdupois. The unit of liquid measure is the U.S. gallon.

1.3 Certified Weights

- A. When payment is to be made on the basis of weight, the weighing shall be done on certified platform scales, or when approved by the Construction Manager, on a completely automated weighing and recording system. The Contractor shall furnish the Construction Manager with duplicate licensed weighmaster's certificates showing the actual net weights. The Owner will accept the certificates as evidence of the weights delivered.

1.4 Methods of Measurement

- A. Materials and items of work which are to be paid for on the basis of measurement shall be measured in accordance with the method stipulated in the particular sections involved or the description of Bid Items found in 2.2 of this Section. In determining quantities, all measurements shall be made in a horizontal plane unless otherwise specified.
- B. Material not used from a transporting vehicle shall be determined by the City's Representative and deducted from the certified tag.
- C. When material is to be measured and paid for on a volume basis and it would be impractical to determine the volume, or when requested by the Contractor in writing and approved by the City's Representative in writing, the material will be weighed and converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the City's Representative and shall be agreed to by the Contractor before such method of measurement of pay quantities will be adopted.

- D. Full compensation for all expense involved in conforming to the above requirements for measuring and weighing materials shall be considered as included in the unit prices paid for the materials being measured or weighed and no additional allowances will be made therefore.
- E. 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 the Contractor to conform to the provisions of the Contract; or material not unloaded from the transporting vehicle; or material placed outside the lines indicated on the plans or given by the City's Representative; or material remaining on hand after completion of the Contract, will not be paid for and such quantities will be deducted from the final total quantities. No compensation will be allowed for hauling rejected material.

2.0 DESCRIPTION OF BID ITEMS

2.1 Summary

- A. The Bid Amounts for each Bid Item will be used for comparative bid analysis. The Bid amounts will also form the basis of monthly progress payments. Each Lump Sum bid amount will undergo further breakdown as described later in this section. Unit prices for any unit price bid items will be the basis for monthly progress payment determinations and for any changes related to that Work item. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in its pricing all materials, labor, and equipment necessary to complete each Bid Item (work phase) as shown and specified.

2.2 Description of Bid Items

ITEM 1 – MOBILIZATION/DEMOBILIZATION

- A. Measurement and Payment by Lump Sum Paid on a Percent of Work Complete:
 - 1. The lump sum bid for mobilization and demobilization shall not exceed ten percent (10%) of the total bid price.
 - 2. 50% payment of this bid item shall be made with the first progress payment.
- B. Mobilization shall include, but not limited to:
 - 1. Includes insurance, bonds, permits and project management, including but not limited to, office meetings, field meetings, and overall project coordination with all parties involved with the project. Bonds and insurance will be paid in the first payment request with back-up data provided by the Contractor.
 - 2. Moving onto the site of all equipment; furnishing temporary construction utilities (temporary power, toilets, water, fences, etc.); temporary buildings and field office trailer(s); and other construction related activity as required for the proper

performance and completion of the work. This includes all cost associated with daily mobilizations of personnel, equipment, and material to and from the various project sites.

3. Work and cost associated with preparing and having approved all submittals and schedules per the Standard Specifications, and construction photos and documentation (pre, during, post-construction).
4. The Contractor is responsible for complying with the City and County of El Dorado requirements for locating and mapping all survey monuments per the respective standards. The Contractor is responsible for all coordination with the respective Agencies to satisfy any survey monument mapping requirements prior to the start of construction and at the completion of the project.
5. Includes the costs associated with obtaining all necessary permits and any associated fees necessary to perform the Contract Work. The Contractor is made aware that the following encroachment permits are to be obtained by the Contractor:
 - a. City of Placerville Encroachment Permit, shall be obtained by the Contractor. Refer to Section 01090 – Regulations and Permits for applicable fees.
 - b. City of Placerville Water Use Permit, shall be obtained by the Contractor. Refer to Section 01090 – Regulations and Permits for applicable fees.

C. Demobilization shall include, but not limited to:

1. The preparation of as-built plans as described in the Special Provisions. A final hard copy and electric copy of the as-built plans are due 10-days after substantial completion notification. Final compensation will be delayed until as-built plans are submitted and accepted by the City.
2. The removal of all construction equipment, personnel, construction related materials, temporary facilities, construction markings/paint, debris, and all other construction related items. All sites shall be restored to the City's satisfaction.
3. Providing all contract close out documentation (e.g. lien releases, warranties and guarantees) in compliance with the Contract Documents.

D. The vacant City owned lot at 2950 Mosquito Road (corner of Mosquito Road and US 50) will be available for the contractor's use as a material and equipment laydown yard throughout the duration of the project; the Contractor shall return the lot to pre-construction conditions prior to payment for demobilization.

ITEM 2 – CONSTRUCTION AREA SIGNS

A. Measurement and Payment shall be Full Compensation by Each.

- B. Work shall conform to Section 12 of the Standard Specifications and Special Provisions,
- C. Includes, but not limited to, all tools, equipment, materials, and labor necessary to install and remove all construction signage, and two (2) project identification signs at project site. The two (2) project identification signs will be provided by the City to the Contractor at the pre-construction meeting.

ITEM 3 – POTHOLE EXISTING FACILITIES

- A. Measurement and Payment By Full Compensation By Lump Sum. Includes all labor, equipment and materials for locating and potholing existing facility crossings with the proposed alignment within the limits of work including but not limited to equipment, labor, materials, locating equipment and all other appurtenances as necessary to complete this work.
- B. Potholing must be completed a minimum of 1 week prior to working in any given area and all data must be provided to the Engineer. Pothole data including station & offset, owner, cover depth, facility type, direction, material, and size shall be organized into a spreadsheet and submitted to the Engineer at least 1 week prior to the start of that work. No additional compensation will be provided for a utility located within the standard limits of a USA marking.

ITEM 4 – SITE SAFETY/TRAFFIC CONTROL PLAN

- A. Measurement and Payment by Lump Sum Paid on a Percent of Work Complete
- B. Work to conform to Section 12 of the Standard Specifications and Section 00700 - Special Provisions.
- C. Includes all tools, equipment, materials and labor necessary to provide and implement an approved traffic control plan in compliance with the City and Caltrans encroachment permit standards. This includes, but not limited to, all signage, flaggers, signal control, barricades, cones, K-rail concrete barriers, and other traffic control devices and methods used in the implementation of the traffic control plan. The contractor is responsible for development, approval and implementation of a traffic control plan as well as the removal of all temporary traffic control devices.
- D. If road closures are implemented this will also include all time and materials required to coordinate with the City Police and Fire Department. The Contractor is also responsible to coordinate bus service, mail delivery and garbage pick-up as applicable.
- E. The contractor must not block the movement of pedestrian or bicycle traffic. The contractor must provide for pedestrian and bicycle traffic by phasing construction operations and/or by providing alternative pedestrian and bicycle access through or adjacent to construction areas. Proper advance notice signage with reasonable detours must be installed and maintained through all phases of construction. Pedestrians must never be diverted into a portion of the street used for vehicular traffic or on to private

property unless proper barriers, delineation, and adequate signage are in place. Hand railings for pedestrians must be provided when required by Americans with Disabilities Act (ADA) on each side of bridge or passageway to protect pedestrians from hazards caused by construction operations or adjacent vehicular traffic.

- F. The contractor must notify, in writing, residents and business establishments along the route of the work at least 10 working days prior to road closures and at least 3 working days prior to placing parking restrictions or planned disruption of any ingress and/or egress. The notice provided to the residences and businesses must include, at a minimum, a schedule of closures with estimated closure times, the closure location, and alternate route or detour, and the name and 24-hour phone number of a contract person employed by the contractor.
- G. Safe and passable pedestrian, bicyclist, and vehicular access must be provided and maintained to fire hydrants, homes, commercial and industrial establishments, parking lots, and all similar facilities and establishments. Access must be navigable, continuous, and unobstructed unless otherwise approved by the agency.

ITEM 5 – WATER POLLUTION CONTROL PROGRAM

- A. Measurement and Payment by Lump Sum Paid on a Percent of Work Complete
- B. Work to conform to Section 13 of the Standard Specifications and Section 00700 - Special Provisions.
- C. Includes preparing a Water Pollution Control Program (WPCP) acceptable by the Engineer; all tools, equipment, materials, and labor necessary to implement, maintain, and repair the WPCP and BMPs specified in the WPCP. (See Section 01090 Regulatory Requirements and Permits). This includes, but not limited to, testing and/or reporting that may necessary to keep in compliance with the WPCP. The Contractor is required to have a registered QSP on staff or contracted who shall be named in the WPCP and certifications provided prior to the start of construction.
- D. The contractor must install BMPs, maintain BMPs, perform inspections remove BMPs, and prepare documentation required by the WPCP applicable to the work. At a minimum, inspections must be done weekly and 24 hours prior to, during, and after each rain event, and every 24 hours during extended rain events. The contractor is solely responsible for preparing and maintaining inspection and monitoring records; and for including those records in the WPCP, copies of which must be made available to the City upon request.
- E. The contractor must immediately correct to replace a BMP deemed ineffective by the contractor or engineer. If measures taken by the contractor are inadequate to effectively control water pollution, the City can direct the contractor to revise operations and/or water pollution control efforts. The City reserves the right to take corrective action and withhold City costs for corrective action from progress payments or final payment in accordance with Section 00700 – Special Provisions.

ITEM 6 – PIPE ABANDONMENT

- A. Measurement and Payment shall be by lump sum bid price and shall include but not limited to, equipment, labor and materials for the demolition, disassembly, removal, disposal, salvage, transportation and abandonment of existing facilities and pipelines as shown on the contract drawings. The following items shall be included in the demolition and abandonment bid item costs.
- B. Includes dismantling, demolition, and removal of portions of the existing 2-inch, 4-inch, and 6-inch pipelines necessary to abandon the pipelines in-place, and visible appurtenances such as, but not limited to, vaults, fittings, meters, meter boxes, and valve boxes, saw cutting, AC removal and disposal, excavation and backfill, temporary plating. All existing water valves shall be removed with pipe abandonment. Contractor is responsible for determining the materials, labor, and equipment and performing the work necessary to properly abandon the identified pipelines that include capping ends of pressurized and non-pressurized pipe in accordance with the Plans. All demolition materials described above and in the contract documents shall be removed and legally disposed from the site by the Contractor with the exception of items to be salvaged for the City. Salvaged items are to be coordinated with the City and returned and delivered to the City. Existing 6-inch water main is confirmed to be asbestos concrete.
- C. Includes all costs associated with any temporary tie-ins or abandonments necessary to keep pipelines and services active during construction. The Contractor is responsible for determining the final abandonment sequencing and including all costs in their bid for any temporary and permanent facilities necessary to execute the abandonment plan.
- D. At all abandonment locations Contractor is responsible for restoration of property to the owner's reasonable satisfaction.

ITEM 7 – REMOVE EXISTING FACILITIES

- A. Measurement and Payment shall be by lump sum bid price and shall include but not limited to, equipment, labor and materials for the dismantling, demolition, removal, and disposal of the identified storm drain manhole, drain inlet, fire hydrant, and valves and valve vaults complete. The Contractor is responsible for determining the materials, labor, and equipment and performing the work necessary to complete the demolition of these facilities. All demolition materials described above and in the contract documents shall be removed and legally disposed from the site by the Contractor with the exception of items to be salvaged for the City. Salvaged items are to be coordinated with the City and returned and delivered to the City.
- B. Includes all costs associated with existing fire hydrant abandonment including all labor, equipment, materials, section and pavement restoration and all appurtenances as necessary to abandon the fire hydrant and restore grade to existing conditions.
- C. At all Remove Existing Facility locations Contractor is responsible for restoration of property to the owner's reasonable satisfaction.

ITEM 8 – 4-INCH CONNECTION TO EXISTING

- A. Measurement and Payment shall be Full Compensation by Each, and shall include installation of the necessary connection to the existing 4-inch water main including, but not limited to, equipment, materials, labor and all other appurtenances as necessary to complete this work including, tees, reducers, miscellaneous piping, fittings, polywrap, nut, bolt and gasket sets, valve box, valve riser, ductile iron spools, flex couplings, gripper rings, restraint fittings, locating wire, trenching, bedding, pipe laying, thrust blocking, backfilling, compacting, compaction testing, controlled low-strength material backfill (CLSM), concrete or other import, structural section replacement, temporary and permanent asphalt replacement, landscaping restoration or concrete replacement due to construction activities, complete and in place.
- B. Connection configuration and materials schedule shown in plan details is based on the best available information. Actual configuration and materials required for the connection may vary in the field. No additional payment will be made for different or extra fittings to accommodate actual field conditions.

ITEM 9 – 6-INCH CONNECTION TO EXISTING

- A. Measurement and Payment shall be Full Compensation by Each, and shall include installation of the necessary connection to the existing 6-inch water main including, but not limited to, equipment, materials, labor and all other appurtenances as necessary to complete this work including, tees, reducers, miscellaneous piping, fittings, polywrap, nut, bolt and gasket sets, valve box, valve riser, ductile iron spools, flex couplings, gripper rings, restraint fittings, locating wire, trenching, bedding, pipe laying, thrust blocking, backfilling, compacting, compaction testing, controlled low-strength material backfill (CLSM), concrete or other import, structural section replacement, temporary and permanent asphalt replacement, landscaping restoration or concrete replacement due to construction activities, complete and in place.
- B. Connection configuration and materials schedule shown in plan details is based on the best available information. Actual configuration and materials required for the connection may vary in the field. No additional payment will be made for different or extra fittings to accommodate actual field conditions.

ITEM 10 – 8-INCH CONNECTION TO EXISTING

- A. Measurement and Payment shall be Full Compensation by Each, and shall include installation of the necessary connection to the existing 8-inch water main including, but not limited to, equipment, materials, labor and all other appurtenances as necessary to complete this work including, tees, reducers, miscellaneous piping, fittings, polywrap, nut, bolt and gasket sets, valve box, valve riser, ductile iron spools, flex couplings, gripper rings, restraint fittings, locating wire, trenching, bedding, pipe laying, thrust blocking, backfilling, compacting, compaction testing, controlled low-strength material backfill (CLSM), concrete or other import, structural section replacement, temporary and

permanent asphalt replacement, landscaping restoration or concrete replacement due to construction activities, complete and in place.

- B. Connection configuration and materials schedule shown in plan details is based on the best available information. Actual configuration and materials required for the connection may vary in the field. No additional payment will be made for different or extra fittings to accommodate actual field conditions.

ITEM 11 – 4-INCH PVC C900 POTABLE WATE LINE AND APPURTENANCES (No T-Cut)

- A. Measurement and Payment shall be Full Compensation By the Lineal Foot. Includes but not limited to, equipment, labor and materials for furnishing and installation of 4-inch C900 PVC Class 235 pipe (DR-18) or Class 305 pipe (DR-14), as specified in the plans, fabrication, freighting, fittings, high deflection couplings, restraints, elbows, warning tape, locating wire and corps, placement, excavation, trenching, bedding, backfilling, compacting of backfill, dewatering, thrust blocking, flushing, temporary (cold mix) and permanent (2" HMA) surface pavement repair, temporary striping, and all incidental work in the installation of the pipeline complete and in place.
- B. The total length shown on the Bid Schedule is the estimated horizontal length computed from the design drawings. Payment will be made only on the actual horizontal length of pipe installed. No additional compensation will be paid therefore.

ITEM 12 – 8-INCH PVC C900 POTABLE WATER LINE AND APPURTENANCES (No T-Cut)

- A. Measurement and Payment shall be Full Compensation By the Lineal Foot. Includes but not limited to, equipment, labor and materials for furnishing and installation of 8-inch C900 PVC Class 235 pipe (DR-18) or Class 305 pipe (DR-14), as specified in the plans, fabrication, freighting, fittings, high deflection couplings, restraints, elbows, warning tape, locating wire and corps, placement, excavation, trenching, bedding, backfilling, compacting of backfill, dewatering, thrust blocking, flushing, temporary (cold mix) and permanent (2" HMA) surface pavement repair, temporary striping, and all incidental work in the installation of the pipeline complete and in place.
- B. The total length shown on the Bid Schedule is the estimated horizontal length computed from the design drawings. Payment will be made only on the actual horizontal length of pipe installed. No additional compensation will be paid therefore.

ITEM 13 – 8-INCH PVC C900 POTABLE WATER LINE AND APPURTENANCES

- A. Measurement and Payment shall be Full Compensation By the Lineal Foot. Includes but not limited to, equipment, labor and materials for furnishing and installation of 8-inch C900 PVC Class 235 pipe (DR-18) or Class 305 pipe (DR-14), as specified in the plans, fabrication, freighting, fittings, restraints, elbows, high deflection couplings, warning tape, locating wire and corps, placement, excavation, trenching, bedding, backfilling, compacting of backfill, dewatering, thrust blocking, flushing, temporary (cold mix) and

permanent surface pavement repair (HMA), T-Cut, temporary striping, and all incidental work in the installation of the pipeline complete and in place.

- B. The total length shown on the Bid Schedule is the estimated horizontal length computed from the design drawings. Payment will be made only on the actual horizontal length of pipe installed. No additional compensation will be paid therefore.

ITEM 14 & 15 – 6 & 8-INCH GATE VALVE

- A. Measurement and Payment shall be Full Compensation by Each.
- B. Work to conform to Section 15114 – Valves and Related Equipment, of the project specifications.
- C. This includes all labor, tools, equipment, and materials necessary to complete the installation of valves that includes, but is not limited to, fabrication, freight, and furnishing of valves; nuts and bolts; gaskets; restraint; valve operating extension; and valve risers/extendors, box, and cover.
- D. This includes adjusting all valve boxes and iron to grade upon placing permanent pavement. Contractor shall provide all tools, equipment, materials, and labor necessary to make the adjustments to grade including, but not limited to, furnishing all materials; saw cutting; excavation and backfill; subgrade preparation; placing temporary pavement; constructing concrete collars; pavement removal; adjusting existing iron and utility boxes; furnishing new iron and utility boxes (if applicable); and all incidental work necessary to make the adjustment to grade. All frames, covers, boxes, grates, and manholes are permitted for reuse unless damage occurs during initial removal or unless otherwise directed by the Engineer or shown on the plans.
- E. The adjustment to grade are located throughout the project in areas of new construction, new pavement, and hardscape locations. All work shall be coordinate with the City construction inspector.
- F. The quantity shown on the bid schedule is an estimated number of valve installations and adjustments to grade. Payment will be made based on the actual number of valves installed by the sizes indicated. Additional payment will not be made for new frames, covers, boxes, grates, and manholes installed as a result of contractor damage during removal of existing facilities. No payment will be made for adjusting frames, covers, boxes, grates, or manholes not required as a result of the construction work.

ITEM 16 – 1-INCH WATER SERVICE AND METER ONLY (NO PRESSURE REGULATOR)

- A. Measurement and Payment shall be Full Compensation by Each. Work shall include the general installation of 1-inch service line and replacement of water meter.
- B. The new water meter shall be provided by the City for this work. All other installation materials shall be supplied by the Contractor.

- C. The Contractor shall be responsible for examining all specified properties to determine all labor, materials, and equipment necessary to install a new 1-inch polyethylene pipe water service, removing existing 1-inch meter, and complete the installation of the new meter into the existing meter box in the existing location. This includes, but not limited to, furnishing valve(s), service saddle, corp stop, curb stop, pipe, fittings, couplings, excavation, drain rock, backfill and compaction, tie-in to existing in-tract line, and all other incidentals necessary to complete the item. No additional compensation will be made if wet connections are required.

ITEM 17 – 2-INCH WATER SERVICE ONLY (CONNECT TO EXISTING METER)

- A. Measurement and Payment shall be Full Compensation by Each. Work shall include the general installation of 2-inch service line only.
- B. All installation materials shall be supplied by the Contractor.
- C. The Contractor shall be responsible for examining all specified properties to determine all labor, materials, and equipment necessary to install a new 2-inch polyethylene pipe water service, and complete the installation of the new service to the existing meter into the existing meter box. This includes, but not limited to, furnishing valve(s), service saddle, corp stop, curb stop, pipe, fittings, couplings, excavation, drain rock, backfill and compaction, and all other incidentals necessary to complete the item. No additional compensation will be made if wet connections are required.

ITEM 18 – 1-INCH SERVICE (TYPE 1)

- A. Measurement and Payment shall be Full Compensation by Each. Work shall include the general installation of service line, water meter, pressure regulator, traffic rated meter boxes and lids.
- B. The new water meter, pressure regulator, meter boxes, and lids shall be provided by the City for this work. All other installation materials shall be supplied by the Contractor.
- C. The Contractor shall be responsible for examining all specified properties to determine all labor, materials, and equipment necessary to install a new 1-inch polyethylene water service, removing existing 1-inch meter, and complete the installation of the new meter, residential pressure regulator, and meter boxes as specified as "Type 1" in the project plans. This includes, but not limited to, furnishing valve(s), service saddle, corp stop, curb stop, pipe, fittings, couplings, excavation, drain rock, backfill and compaction, tie-in to existing in-tract line, and all other incidentals necessary to complete the item. No additional compensation will be made if wet connections are required.
- D. The Contractor shall include in their bid price the removal and replacement of up to 10-feet of additional in-tract pipe past the new meter box. Connection to the existing in-tract pipe shall be made at the City agreed upon location; additional pipe replacement past the 10-feet will be paid under force account.

- E. Contractor shall coordinate new meter and pressure regulator placement with City inspector prior to excavation.

ITEM 19 – 1-INCH SERVICE (TYPE 2)

- A. Measurement and Payment shall be Full Compensation by Each. Work shall include the general installation of service line, water meter, pressure regulator, traffic rated meter boxes and lids.
- B. The new water meter, pressure regulator, meter boxes, and lids shall be provided by the City for this work. All other installation materials shall be supplied by the Contractor.
- C. The Contractor shall be responsible for examining all specified properties to determine all labor, materials, and equipment necessary to install a new 1-inch polyethylene water service, removing existing 1-inch meter, and complete the installation of the new meter, residential pressure regulator, and meter boxes as specified as "Type 2" in the project plans. This includes, but not limited to, furnishing valve(s), service saddle, corp stop, curb stop, pipe, fittings, couplings, excavation, drain rock, backfill and compaction, tie-in to existing in-tract line, and all other incidentals necessary to complete the item. No additional compensation will be made if wet connections are required.
- D. The Contractor shall include in their bid price the removal and replacement of up to 10-feet of additional in-tract pipe past the new meter box. Connection to the existing in-tract pipe shall be made at the City agreed upon location; additional pipe replacement past the 10-feet will be paid under force account.
- E. Contractor shall coordinate new meter and pressure regulator placement with City inspector prior to excavation.

ITEM 20 – FIRE HYDRANT ASSEMBLY

- A. Measurement and Payment shall be Full Compensation by Each.
- B. The fire hydrant assemblies shall be measured per each assembly complete and in place as shown on the Plans.
- C. The payment for each fire hydrant assembly shall include full compensation for furnishing all labor, materials, and tools and equipment required to furnish and install the fire hydrant assembly complete and in place. This shall include, but not limited to, all necessary gate valves, piping, hydrant, hydrant bury, riser, valve box, tracer wire, fittings, tees, restraints, concrete and thrust block, excavation and backfill, sawcutting and demolition, grading, concrete and/or asphalt restoration, painting and all other incidentals necessary to complete this item.
- D. This bid item shall include all costs associated with installing a fire hydrant assembly, and includes any labor and materials necessary for phasing work to keep the existing fire hydrant on line until the new fire hydrant is constructed and activated.

- E. This bid item does not include the abandonment or removal of the existing fire hydrant and associated valves and piping that will be paid under separate Bid Item.

ITEM 21 – WATER QUALITY SAMPLING STATION

- A. Measurement and Payment shall be Full Compensation by Each.
- B. The water quality sampling station shall be measured per each station complete and as shown in the Plans and in Appendix C of the project specifications.
- C. The payment for each water quality sampling station shall include full compensation for furnishing all labor, materials, and tools and equipment required to furnish and install the water quality sampling station assembly complete and in place. This shall include, but not limited to, the installation of the Koraleen water quality sampling station all necessary valves, saddle, piping, riser, valve box, tracer wire, fittings, tees, restraints, concrete and thrust block, excavation and backfill, sawcutting and demolition, grading, concrete and/or asphalt restoration, painting and all other incidentals necessary to complete this item.

ITEM 22 – 2-INCH DEAD END BLOW-OFF AND COMBINATION AIR VALVE

- A. Measurement and Payment shall be Full Compensation by Each.
- B. The 2-inch dead end blow-off and combination air release valve shall be measured for the station complete and assembled as shown on the Plans.
- C. The payment for each station shall include furnishing all labor, materials, tools, and equipment required to install each station complete and in place. This includes but not limited to furnishing the companion flange, all necessary valves, piping, riser, valve box, tracer wire, fittings, concrete and thrust block, marker post, enclosure, excavation and backfill, backfill material, grading, concrete and/or asphalt restoration, painting and any other incidentals necessary to complete this item.

ITEM 23 – CONTAMINATED SOIL DISPOSAL (CLASS II)

- A. Potentially contaminated soils are located between station 5+00 and station 10+00. The soils excavated from the trench will be stockpiled at the 2950 Mosquito Road staging area and tested by the City according to the Soil Management Plan prepared by Geocon Consultants, Inc, dated September 2019 (Appendix F). Soils will be classified as Offsite Refuse, Class II Disposal or CAL HAZ.

Class II Disposal contaminated soils shall be disposed of at the Ostrom Road Landfill located at 5900 Ostrom Road in Wheatland CA.

- B. Measurement and Payment shall be paid by the cubic yard and shall include but is not limited to, equipment, labor, stockpiling, processing, hauling, disposal and tipping fees for all trench excavation identified as Class II Disposal contaminated, and disposing of them at the Ostrom Road Landfill. Contractor shall provide receipts for all soils delivered

to the Ostrom Road Landfill. For estimation purposes cubic yard is based 1 CY = 1.75 tons.

ITEM 24 – CONTAMINATED SOIL DISPOSAL (CAL HAZ)

- A. Potentially contaminated soils are located between station 5+00 and Station 10+00. The soils excavated from the trench will be stockpiled at the 2950 Mosquito Road staging area and tested by the City according to the Soil Management Plan prepared by Geocon Consultants, Inc, dated September 2019 (Appendix F). Soils will be classified as Offsite Refuse, Class II Disposal or CAL HAZ.

CAL HAZ contaminated soils shall be disposed of at the Kettleman Hills Landfill located at 35251 Old Skyline Road, Kettleman City, CA 93239.

- A. Measurement and Payment shall be paid by the cubic yard and shall include but is not limited to, equipment, labor, stockpiling, processing, hauling, disposal and tipping fees for all trench excavation identified as CAL HAZ contaminated, and disposing of them at the Kettleman Hills Landfill. Contractor shall provide receipts for all soils delivered to the Kettleman Hills Landfill. For estimation purposes cubic yard is based 1 CY = 1.75 tons.

ITEM 25 – CONTAMINATED SOIL DISPOSAL (OFFSITE REUSE)

- A. Potentially contaminated soils are located between station 5+00 and station 10+00. The soils excavated from the trench will be stockpiled at the 2950 Mosquito Road staging area and tested by the City according to the Soil Management Plan prepared by Geocon Consultants, Inc, dated September 2019 (Appendix F). Soils will be classified as Offsite Refuse, Class II Disposal or CAL HAZ.

Offsite Reuse soils become the property of the contractor for disposal at a permitted location of their choice. Contractor shall submit location and permitting information for all clean soil disposal site locations.

- B. Measurement and Payment shall be paid by the cubic yard and shall include but is not limited to equipment, labor, stockpiling, processing, hauling, disposal and tipping fees for all trench excavation identified as Offsite Reuse, and disposing of them at a permitted site. Contractor shall provide receipts for all soils delivered to permitted site. For estimation purposes cubic yard is based 1 CY = 1.75 tons.

ITEM 26 – WATER MAIN PRESSURE TESTING

- A. Measurement and Payment shall be Full Compensation By the Lump Sum Paid on a Percent of Work Complete. Item shall include, but not limited to, providing and furnishing all equipment, labor and materials for performing pressure testing of the system.
- B. Pressure testing operations shall comply with Section 02660 – Water Piping System Pressure Testing, of the project specifications. Segmented pressure testing of the system is anticipated.

- C. Item to include all costs associated with pressure testing including, filling, temporary tie-in's, disposal of water, restoration, fittings, valves, de-chlorination, equipment, labor, materials, equipment, and all water necessary to pressure test the system. This bid item will provide for complete pressure testing of the entire system regardless of how pressure tests are phased or segmented. No additional compensation will be provided.
- D. If the system, or system segment, does not pass the pressure test, the contractor shall make any necessary repairs and retest the system, or segment, at their own expense.

ITEM 27 – WATER MAIN DISINFECTION

- A. Measurement and Payment shall be Full Compensation By the Lump Sum Paid on a Percent of Work Complete. Item shall include, but not limited to, providing and furnishing all equipment, labor and materials for providing disinfection of the system.
- B. Disinfection operations shall comply with Section 02661 – Disinfecting Water Mains, of the project specifications. Segmented disinfection operations of the system are anticipated.
- C. Item to include all costs associated with disinfection of the pipeline including, cleaning, chemicals, filling, temporary tie-in's, testing, monitoring, restoration, fittings, valves, disposal of water, de-chlorination, equipment, labor, materials, equipment, and all water necessary to disinfect the system. This bid item will provide for complete disinfection and testing of the entire system regardless of how disinfection and tests are phased or segmented. No additional compensation will be provided.
- D. If the system, or system segment, does not pass the disinfection test, the contractor shall make any necessary repairs and retest the system, or segment, at their own expense.

ITEM 28 - 8" ACP PIPE LINING (CURED-IN-PLACE PIPE)

- A. Paid by Unit Price per Lineal Foot measured along centerline of pipe.
- B. Work to conform to Section 13 of the Standard Specifications and Special Provisions.
- C. Includes all tools, equipment, materials, and labor necessary to install the CIPP. Including but not limited to fabrication, freighting, and furnishing of the CIPP; cleaning; bypass pumping; acceptance testing; dewatering; placement; flushing; disinfecting; CCTV inspections, all incidental work in the installation of the CIPP, and preparation and implementation of WPCP per Section 1090 – Regulatory Requirements and Permits. Any utilities damaged during the installation of the CIPP must be repaired to the satisfaction of the City. Excluded from this Item are items listed separately on the Bid Schedule such as mobilization/ demobilization, traffic control system 12-inch, 18-inch, and 21-inch CMP Pipe Lining (Cured-In-Place Pipe).
- D. The 8" ACP pipes being lined are located in Mosquito Road between STA 3+75 to STA 16+90, approximately.

- E. The quantity shown on the Bid Schedule is an estimated length of CIPP installed in 8" ACP. Payment will be made per the actual Lineal Footage of CIPP installed in 8" ACP.

ITEM 29 - 12" CMP PIPE LINING (CURED-IN-PLACE PIPE)

- A. Paid by Unit Price per Lineal Foot measured along centerline of pipe.
- B. Work to conform to Section 13 of the Standard Specifications and Special Provisions.
- C. Includes all tools, equipment, materials, and labor necessary to install the CIPP. Including but not limited to fabrication, freighting, and furnishing of the CIPP; cleaning; bypass pumping; acceptance testing; dewatering; placement; flushing; disinfecting; CCTV inspections, all incidental work in the installation of the CIPP, and preparation and implementation of WPCP per Section 1090 – Regulatory Requirements and Permits. Any utilities damaged during the installation of the CIPP must be repaired to the satisfaction of the City. Excluded from this Item are items listed separately on the Bid Schedule such as mobilization/demobilization, traffic control system, and 8-inch ACP, 18-inch and 21-inch CMP Pipe Lining (Cured-In-Place Pipe).
- D. The 12" CMP pipe being lined are located in Mosquito Road perpendicular to the roadway alignment at station 10+50, approximately.
- E. The quantity shown on the Bid Schedule is an estimated length of CIPP installed in 12" CMP. Payment will be made per the actual Lineal Footage of CIPP installed in 12" CMP.

ITEM 30 - 18" CMP PIPE LINING (CURED-IN-PLACE PIPE)

- A. Paid by Unit Price per Lineal Foot measured along centerline of pipe.
- B. Work to conform to Section 13 of the Standard Specifications and Special Provisions.
- C. Includes all tools, equipment, materials, and labor necessary to install the CIPP. Including but not limited to fabrication, freighting, and furnishing of the CIPP; cleaning; bypass pumping; acceptance testing; dewatering; placement; flushing; disinfecting; CCTV inspections, all incidental work in the installation of the CIPP, and preparation and implementation of WPCP per Section 1090 – Regulatory Requirements and Permits. Any utilities damaged during the installation of the CIPP must be repaired to the satisfaction of the City. Excluded from this Item are items listed separately on the Bid Schedule such as mobilization/demobilization, traffic control system and 8-inch ACP, 12-inch and 21-inch CMP Pipe Lining (Cured-In-Place Pipe).
- D. The 18" CMP pipe being lined are located in Mosquito Road perpendicular to the roadway alignment at station 5+15, approximately.
- E. The quantity shown on the Bid Schedule is an estimated length of CIPP installed in 18" CMP. Payment will be made per the actual Lineal Footage of CIPP installed in 18" CMP.

ITEM 31 - 21" CMP PIPE LINING (CURED-IN-PLACE PIPE)

- A. Paid by Unit Price per Lineal Foot measured along centerline of pipe.
- B. Work to conform to Section 13 of the Standard Specifications and Special Provisions.
- C. Includes all tools, equipment, materials, and labor necessary to install the CIPP. Including but not limited to fabrication, freighting, and furnishing of the CIPP; cleaning; bypass pumping; acceptance testing; dewatering; placement; flushing; disinfecting; CCTV inspections, all incidental work in the installation of the CIPP, and preparation and implementation of WPCP per Section 1090 – Regulatory Requirements and Permits. Any utilities damaged during the installation of the CIPP must be repaired to the satisfaction of the City. Excluded from this Item are items listed separately on the Bid Schedule such as mobilization/demobilization, traffic control system and 8-inch ACP, 12-inch and 18-inch CMP Pipe Lining (Cured-In-Place Pipe).
- D. The 21" CMP pipe being lined are located in Mosquito Road perpendicular to the roadway alignment at station 9+90, approximately.
- E. The quantity shown on the Bid Schedule is an estimated length of CIPP installed in 21" CMP. Payment will be made per the actual Lineal Footage of CIPP installed in 21" CMP.

ITEM 32 – 6-INCH PVC SEWER PIPE (SDR-26) AND APPURTENANCES

- A. Measurement and Payment shall be Full Compensation By the Lineal Foot. Includes but not limited to, equipment, labor and materials for furnishing and installation of 6-inch PVC pipe (SDR-26) compliant with ASTM D3034, fabrication, freighting, fittings, high deflection couplings, elbows, warning tape, locating wire, placement, pressure testing, excavation, bedding, backfilling, compacting of backfill, dewatering, bypass pumping, temporary and permanent surface pavement repair, T-Cut, temporary striping, and all incidental work in the installation of the pipeline complete and in place.
- B. Pipe shall be installed per typical sewer trench detail on sheet G-2 of the Project Plans.
- C. New sewer pipe shall be leak tested per El Dorado Irrigation District Technical Specification 33 01 30.13 found in Appendix D of the Project Specifications.
- D. The total length shown on the Bid Schedule is the estimated horizontal length computed from the design drawings. Payment will be made only on the actual horizontal length of pipe installed. No additional compensation will be paid therefore.

ITEM 33 – SEWER CLEAN-OUT

- A. Measurement and Payment shall be Full Compensation by Each.
- B. The Contractor shall be responsible to provide all necessary labor, materials, and equipment to complete the installation of the new sewer cleanout. This includes, but not limited to clean-out materials, excavation, backfill, compaction, and property restoration.

ITEM 34 – 48-INCH CAST-IN-PLACE SEWER MANHOLE

- A. Measurement and Payment shall be Full Compensation by Each. Item shall include, but not limited to, providing and furnishing all equipment, labor and materials for installing new 48-inch cast-in-place sewer manhole.
- B. Includes but not limited to, equipment, labor and materials for furnishing and installation of 48-inch cast-in-place manhole, fabrication, freighting, fittings, water stop, 24-inch frame and cover, concrete collar, precast grade rings, lining, placement, pressure testing, excavation, bedding, backfilling, compacting of backfill, dewatering, bypass pumping, temporary and permanent surface pavement repair, temporary striping, and all incidental work in the installation of the manhole complete and in place.
- C. Manhole shall be installed per El Dorado Irrigation District Technical Specification 33 39 13 found in Appendix D of the Project Specifications.
- D. Frame and ring shall be D&L foundry A-1015, South Bay Foundry SBF 1900, or approved equivalent.
- E. All new manholes included in project scope are believed to be <10' deep. Exact depths are not known and shall be determined by the contractor in the field.

ITEM 35 – VERTICAL CURB AND GUTTER

- A. Measurement and Payment shall be Full Compensation By the Lineal Foot. Item shall include, but not limited to, providing and furnishing all equipment, labor and materials for matching existing concrete vertical curb and gutter.
- B. Work to conform to Section 73 of the Standard Specifications.
- C. Includes all costs associated with removal and disposal of the existing curb and gutter.
- D. Item shall include, installing new vertical concrete curbs and gutters as shown on the plans, matching existing, and in accordance with the City Standards. This includes, but not limited to, proper site preparation to accommodate concrete curbs, and gutters, 4-inch AB base section, 6-inch concrete section, forms, expansion joint material, dowelling into adjacent existing curb & gutter, and all other incidentals necessary for a complete installation of concrete curbs and gutters.

ITEM 36 – 5-FOOT SIDEWALK

- A. Measurement and Payment shall be Full Compensation By the Square Foot. Item shall include, but not limited to, providing and furnishing all equipment, labor and materials for matching existing 5-foot concrete sidewalk.
- B. Work to conform to Section 73 of the Standard Specifications.
- C. Includes all costs associated with removal and disposal of the existing sidewalk.
- D. Item shall include, installing new 5-foot concrete sidewalks as shown on the plans, matching existing, and in accordance with the City Standards. This includes, but not

limited to, proper site preparation to accommodate sidewalk, 4-inch AB base section, 4-inch concrete section, forms, expansion joint material, dowelling into adjacent existing sidewalk, and all other incidentals necessary for a complete installation of 5-foot concrete sidewalk.

ITEM 37 – 2-INCH HMA REMOVE AND REPLACE

- A. Measurement and Payment shall be by the Square Foot and shall include but not limited to, equipment, labor and materials to remove a 2-inch deep section of existing roadway and roadway base, and place a 2-inch deep section of hot mix asphalt.
- B. HMA material and placement shall be compliant to Section 39 of the Standard Specifications.
- C. All final striping shall be temporary in anticipation of subsequent separate overlay project.

ITEM 38 – 8-INCH HMA REMOVE AND REPLACE

- A. Measurement and Payment shall be by the Square Foot and shall include but not limited to, equipment, labor and materials to excavate an 8-inch deep section of existing roadway and roadway base, and place an 8-inch deep section of hot mix asphalt.
- B. HMA material and placement shall be compliant to Section 39 of the Standard Specifications.
- C. All final striping shall be temporary in anticipation of subsequent separate overlay project.

ITEM 39 – CONCRETE BASE EXCAVATION

- A. Measurement and Payment shall be by the Linear Foot and shall include but not limited to, equipment, labor and materials to excavate an existing section of concrete roadway base layer that is between 6 to 12 inches thick. The exact limits of the concrete base layer are not definite but have been confirmed to exist between stations 3+00 and 7+50 and may be discovered in other locations. The quantity shown on the Bid Schedule is an estimated length and payment will be made per the actual Lineal Footage of concrete base layer excavated for the installation of new water and sewer pipe.

ITEM 40 – BOLLARD

- A. Measurement and Payment shall be Full Compensation By Each. Item shall include, but not limited to, providing and furnishing all equipment, labor materials for installing new bollards protecting new fire hydrants.
- B. This bid item includes all excavation, materials, concrete, asphalt, aggregate base, property restoration, paint, labor, materials and equipment as necessary to install the bollards complete and in place.

- C. Also includes coordination with the City of Placerville for the final bollard placement locations.

3.0 CONTRACTOR'S COST BREAKDOWN

For work to be performed for a lump sum amount, the Contractor shall submit a cost breakdown to the City Representative prior to the first payment and within ten (10) days after Notice to Proceed. The cost breakdown, as agreed upon by the Contractor and the City Representative, shall be used for preparing future estimates for partial payments to the Contractor, and shall list the major items of work with a price fairly apportioned to each item.

The cost breakdown shall be generally in the same format as the Contract specifications divisions and subdivisions, with major items of work listed individually. The cost breakdown shall be by structure, civil, landscaping, or other logical division of work. The cost breakdown for architectural, structural, mechanical, and electrical work shall include separate items for identifiable portions of the structures. The cost breakdown shall include separate allowances for any testing and startup work required. Measurable approximate quantities of work performed by the Contractor or its subcontractors shall be provided. For quantities that are the sum total of several individual quantities, backup summaries shall be provided which list the individual descriptions and quantities. These summaries then will be used to determine the quantities of work in place in subsequent progress payment requests.

The above is a statement of the intent of the Contract Documents to provide a high level of detail, acceptable to the City Representative, to allow a fair and reasonable estimate to be made of the value of work installed. The detail of the cost breakdown must be sufficient to provide timely processing of the monthly progress payment request.

The cost breakdown will be subject to the approval of the City Representative, and upon request, the Contractor shall substantiate the price for any or all items and provide additional level of detail, including quantities of work. The cost breakdown shall be sufficiently detailed to permit its use by the City Representative as one of the bases for evaluating requests for payments. The City Representative shall be the sole judge of the adequacy of the cost breakdown.

The cost breakdown shall be solely used to determine progress payments. The cost breakdown shall not be considered in determining payment or credit for additional or deleted work.

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**SECTION 01312
PROJECT MEETINGS**

1.0 GENERAL

- A. Project meetings and conferences are an important administration and communication requirement of all project participants. Meetings will address issues related to the Work, review and coordinate progress of the Work and other matters of common interest to project participants. This section describes the requirements for calling for and conducting meetings for the Work. Meeting and conference locations and qualified participants will be determined by the Construction Manager and the Contractor based on the meeting agenda topics.
- B. Minutes will be taken by the Construction Manager for the Pre-Construction Conference(s) and all Progress and Coordination Meetings hereinafter described. Copies of meeting minutes will be distributed to all attendees within five (5) days after meeting. Attendees will have three (3) days to submit comments or additions to minutes received from Construction Manager. Minutes will constitute final documentation of meeting discussion topics, results and action items. Meetings may be recorded by the Construction Manager for accuracy of meeting minutes.

2.0 PRECONSTRUCTION CONFERENCE

- A. Upon issuance of Notice to Proceed, or earlier when mutually agreeable, Construction Manager will schedule a preconstruction conference and organizational meeting at a suitable conference room at the Owner's offices or other suitable location. More than one preconstruction conference may be required if the Owner and Contractor deem it is in the best interest of the project to do so. Construction Manager will preside at conference.
- B. Attending the Preconstruction Conference: Contractor's Project Manager, Contractor's Superintendent(s), Owner, Construction Manager, Engineer, Owner's subconsultants, and representatives of utilities, major subcontractors and others involved in performance of the Work, and others necessary to agenda.
- C. The Construction Manager, in concert with the Owner, Engineer and Contractor, will prepare an agenda for discussion of significant items relative to contract requirements, procedures, coordination and construction. Items on the agenda will include the Contractor's field organization, Owner's organizational chart of representatives/consultants, contract administration procedures, Contractor's preliminary schedule, submittals, progress payments, change order procedures, security, testing, safety and permit requirements, inspection procedures, and other project related matters.
- D. Unless previously submitted to Engineer, Contractor shall bring to the conference a preliminary schedule for each of the following:
 - 1. Progress Schedule
 - 2. Procurement Schedule
 - 3. Schedule of Values for progress payment purposes
 - 4. Schedule of Shop Drawings and other submittals
- E. The purpose of the conference is to designate responsibility personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda will include, but not be limited to:

1. Contractor's preliminary schedules
2. Transmittal, review, and distribution of Contractor's submittals
3. Processing Applications for Payment
4. Maintaining record documents
5. Critical Work sequencing
6. Field decisions and Change Orders
7. Use of premises, office and storage areas, security, and housekeeping
8. Owner's needs
9. Major equipment deliveries and priorities
10. Contractor's assignments for safety and first aid

3.0 PROGRESS AND COORDINATION MEETINGS

- A. The Construction Manager shall schedule, arrange and conduct progress and coordination meetings. These meetings shall be conducted not more than once per week and shall be attended by the Contractor's superintendent and representatives of all subcontractors, utilities, and others that are active in the execution of the Work or involved in an important progress meeting agenda item. Upon approval of the Construction Manager, meeting sub-tier level participants with a minor role at that juncture in the project, may participate in progress meetings by speakerphone if there are suitable facilities to do so.
- B. The Agenda of each progress meeting will include the review, correction (if necessary) and approval of minutes of the previous progress meeting; review items of significance that could affect project progress and cost; review status of previous action items and determine what new action items are necessary to insure the project stays on schedule; review quality control; and review Contractor's three (3) week schedule provided in accordance with other sections of these Specifications. The Contractor will distribute a copy of and present the RFIs, Submittals, and potential change logs at each progress and coordination meeting.
- C. Progress and coordination meetings will be held at the project site, Owner's offices or another mutually agreeable place.

4.0 PROGRESS SCHEDULE AND PROGRESS BILLING MEETINGS

- A. Each month the Contractor shall attend a progress schedule and progress payment meeting with the Construction Manager. At this meeting, the Construction Manager and Contractor are to review the percentage of the work completed and establish an amount to be requested in the Application for Payment. The meeting date shall be scheduled in accordance with the Owner's deadline for submittal of Progress Pay Estimates. Following review of the proposed billing, the Contractor will prepare an Application of Payment and submit to the Construction Manager for final review and processing.
- B. These meetings will also discuss time impact evaluations for change orders and time extension requests, actual and anticipated schedule activity sequence/duration changes, and Contractor delays. These meetings are considered a critical component of the overall monthly schedule update submittal and Contractor shall have appropriate personnel attend.
- C. The Construction Manager can also call for special progress schedule meetings should there be schedule revisions that necessitate such a meeting.

5.0 SUBMITTAL MEETINGS

- A. When required in the individual technical specification, or if requested by the Contractor or the Construction Manager, a meeting regarding a required submittal will be held to facilitate the timeliness of the submittal preparation and review process. This meeting will convene at a mutually agreeable place. The party responsible for preparing the submittal shall be in attendance along with the Engineer.

6.0 QUALITY ASSURANCE MEETINGS

- A. The Contractor or the Construction Manager may request a meeting prior to the start of a particular phase of the project to discuss how the Work shall be accomplished in accordance with the quality requirements of the contract documents, codes, permits and industry standards. All required inspection and testing applicable to this phase of the project will be discussed in detail. The Contractor shall require that all management and quality control personnel employed by the Contractor for this phase of the project are in attendance. Quality assurance meetings might be requested for such phases of the project as site work, concrete, piping, mechanical, specialty subtrades and electrical/instrumentation.

7.0 PRE-INSTALLATION MEETINGS

- A. When required in the individual specification, or if requested by the Contractor or Construction Manager, a pre-installation meeting will be held to review conditions of the installation, installation procedures and coordination with related work. This meeting should take place at least seven (7) days in advance of installation or as required in the technical specifications. Meeting is to be attended by all parties involved in the installation.

8.0 PRE-SUBSTANTIAL COMPLETION MEETING

- A. Thirty (30) days prior to the estimated substantial completion, the Construction Manager, Owner, Engineer, Contractor and appropriate subcontractors will meet to review maintenance manuals, guarantees, closeout submittals, bonds, and service contracts for materials and equipment.

9.0 SPECIAL MEETINGS

- A. Any time during progress of the Work, the Owner and the Construction Manager shall have the authority to require the Contractor and any subcontractor, suppliers, or service providers to attend job-site conferences on matters which require immediate or special attention. Any notice of such conference shall be duly observed and complied with by the Contractor and subcontractors, suppliers, or service providers without extra cost to Owner.

10.0 POST CONSTRUCTION GUARANTY PERIOD MEETING

- A. The Contractor shall meet with the Owner, Construction Manager and Engineer approximately eleven (11) months after date of Substantial Completion to inspect the Work. Meeting will be arranged by the Owner at least seven (7) days before meeting. The Contractor will require attendance of its Project Manager/Superintendent, appropriate manufactures and appropriate subcontractors.

*****END OF SECTION*****

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**SECTION 01325
PROJECT SCHEDULES AND REPORTS**

1.0 GENERAL

The requirements for project schedules and reports are included to assure adequate planning and execution of the work and to assist the Construction Manager in appraising the reasonableness of the proposed schedule and evaluating the progress of the work.

2.0 CONSTRUCTION SCHEDULE

2.1 The schedule shall be submitted within ten (10) days of Notice to Proceed and favorably reviewed by the Construction Manager before the first partial payment can be made.

2.2 Baseline Schedule

The Contractor shall submit the schedule based on either the bar chart method or the Critical Path Method (CPM). The schedule shall indicate preceding activity relationships and/or restraints where applicable and a controlling path shall be indicated. The schedule shall be time scaled and shall be drafted to show a continuous flow from left to right. The construction schedule shall clearly show the sequence of construction operations and specifically list:

- A. The start and completion dates of all work items.
- B. The dates of submittals, procurement, delivery, installation and completion of each major equipment and material requirement.
- C. Progress milestone events or other significant stages of completion, as defined in Section 00800-1.1, **Time Allowed for Completion**, and Section 01140, **WORK RESTRICTIONS**.
- D. The lead time required for testing, inspection and other procedures required prior to acceptance of the work.

Activities shall be no longer than ten (10) workdays, except for submittals and delivery items. If an activity takes longer, it shall be broken into appropriate segments of work for measurement of progress. This limitation may be waived, upon approval of the Construction Manager, for repetitious activities of longer durations for which progress can be easily monitored.

2.3 Float

“Total Float” or “Float” shall be defined as the difference between the early finish and late finish dates for an activity.

On the schedule delineate the specified Contract duration and identify the planned completion of the Work as the final milestone. The time period between these two dates, if any, shall be considered contract float.

Float in any activity, milestone completion date or Contract completion date shall be considered a resource available to both the Owner and the Contractor. Neither the Owner nor the

Contractor has ownership of the float. Float is for the benefit of the Project. Acceptance of the Contractor's Baseline Schedule, monthly updates or revised schedule, when based on less time than the maximum time allowed for milestone(s) or Contract completion does not serve to change any Contract duration, nor serve as a waiver of the Contractor's nor the Owner's right to utilize the full amount of time specified in the Contract, unless so modified in a Contract Change Order.

2.4 Reports – One of the following reports shall be submitted as the Baseline Schedule:

- A. Bar Chart: A report which lists each activity description, early start and finish dates, and all preceding and succeeding activities. The report shall conspicuously indicate all activities on the controlling path.
- B. CPM Schedule: A CPM network report sorted by activity number which lists each activity description, early start and finish dates, preceding and succeeding activities and restraints, including lead/lag durations. The report shall show the critical path.
 - CPM network report sorted by total float.
 - CPM network report sorted by early start.

3.0 WEATHER CONDITIONS

Seasonal weather conditions shall be considered in the planning and scheduling of work activity durations influenced by high or low ambient temperatures or precipitation to ensure the completion of the Work within the Contract Time. No time extensions will be granted for the Contractor's failure to take into account such weather conditions for the location of the Work and for the period of time in which the Work is to be accomplished.

The expected loss of working days specified in the Supplementary General Conditions, Section 00800-1.3, **WeatherDays**, shall be included in a separate identifiable critical activity labeled "Weather Days Allowance" to be included as the last critical activity of the project schedule. When weather days are experienced, and are approved as such by the Construction Manager, the Contractor shall either:

- A. Increase the duration of the current critical activity(ies) by the number of weather days experienced, or
- B. Add a critical activity to the schedule to reflect the occurrence of the weather day(s).

The duration of the weather day allowance activity shall be reduced as weather days are experienced and included in the schedule. Any remaining weather days in the weather day allowance activity at the completion of the project shall be considered as float and shall not be for the exclusive use or benefit of either the Owner or Contractor.

4.0 UPDATES

4.1 Submittal Period

The Contractor shall submit at monthly intervals a report of the actual construction progress. Each monthly report shall cover a period of approximately thirty (30) days. The monthly reports

shall be submitted within ten (10) days of the end of the reporting period. The end of the reporting period shall be as agreed upon by the Construction Manager and Contractor.

Produce and provide one (1) complete set each of time-scaled logic diagrams and bar chart on 22-inch by 34-inch sheets. The network diagram shall be clear and legible. Critical activities shall be indicated in red color. Progress bars shall be conspicuously identified by color other than red, black or white.

4.1.1 AllMonthlyUpdates - All monthly updates shall include as a minimum:

- A. Reports - Provide the reports defined in Section 01310-3.3.4, Reports.
- B. Narrative and Tabular Report - The report shall show the activities or portions of activities completed during the reporting period. The report shall state the percentage of the work actually completed and scheduled, the remaining duration, and the progress along the critical path in terms of days ahead or behind the allowable dates as of the report date. Any changes made by the Contractor to the CPM schedule, including activity numbers, durations, constraints and activity descriptions, shall be listed in a detailed report which describes the reason for each.
- C. Activity Numbers and Descriptions – New activity numbers and descriptions may be added where required to further define the work and as approved by the Construction Manager. Activities may be deleted if the applicable work has not been performed and is deleted from the Work and as approved by the Construction Manager.

4.1.2 DelayedScheduleUpdates - If, in the opinion of the Construction Manager, the project is behind schedule, the Contractor shall submit a narrative report with each updated analysis which shall include but not be limited to, a description of current and anticipated problem areas, delaying factors and their impact, and an explanation of corrective actions taken or proposed.

4.2 Schedule Review

Once each month, on a date mutually agreed upon, but no later than ten (10) days after the submittal of the monthly update specified herein, a jobsite meeting will be held to review the CPM Schedule, job progress and the monthly update, or the Construction Manager will provide written comments on the monthly update.

5.0 TIME IMPACT ANALYSES

When change orders are initiated, delays are experienced, or the Contractor desires to revise the schedule logic, the Contractor shall submit to the Construction Manager a written Time Impact Analysis illustrating the influence of each change, delay, or Contractor request on the current contract schedule completion date.

6.0 WEEKLY ACTIVITIES PLAN

On the last working day of every week the Contractor shall submit to the Construction Manager the Contractor's Plan of Activities for the next three weeks. The Plan of Activities shall describe

the activity and location of the activity and include the activity number as provided in the CPM Schedule.

7.0 CONTRACTOR'S DAILY REPORTS

The Contractor shall maintain daily job reports recording all significant activity on the project, including number of workers on site, active construction equipment used, notable deliveries, work activities, delays, interruptions or any problems encountered. If there is no work performed on any given day, the Contractor shall note the reasons for no work and submit a daily report to the Construction Manager on those days also. Failure to stay current with daily reporting will be just cause for the Owner not processing a progress payment until reports are submitted.

***** END OF SECTION *****

SECTION 01330 SUBMITTAL PROCEDURES

1.0 GENERAL

- A. Where required by the Contract Documents, the Contractor shall submit descriptive information that will enable determination of whether the Contractor's proposed materials, equipment, or methods of work are in general conformance to the design concept and in compliance with the Contract Documents. The information to be submitted shall consist of drawings, specifications, descriptive data, certificates, samples, test results and such other information, all as specifically required in the specifications. In some instances, specified submittal information describes some, but not all, features of the material equipment, or method of work. Features not requiring submittals shall be as specified.
- B. Submittal review shall be only for general conformance with the design concept and general compliance with the information given in the contract documents. It shall not include review of quantities, dimensions, weights or gages, fabrication processes, construction safety precautions, all of which are the sole responsibility of the Contractor. Review of a specific item shall not indicate acceptance of an assembly of which the item is a component. The Construction Manager and/or Engineer shall not be required to review and shall not be responsible for any deviations from the contract documents not clearly noted by the Contractor, nor shall the Construction Manager and/or Engineer be required to review partial submissions or those for which submissions for correlated items have not been received.
- C. The Contractor may authorize material or equipment suppliers to deal directly with the Construction Manager with regard to such submittals; however, ultimate responsibility for the accuracy and completeness of the information contained in the submittal shall remain with the Contractor.

2.0 CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the materials and equipment incorporated into the Work, or the methods of performing the Work shall be as described in the accepted submittals.
- B. The Contractor shall verify that all features of all products conform to the specified requirements. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment that are being submitted for review. All extraneous materials shall be crossed out or otherwise obliterated.
- C. The Contractor shall ensure that there is no conflict with other submittals and notify the Construction Manager in each case where his submittal may affect the work of another

contractor or the Owner. The Contractor shall coordinate submittals among its subcontractors and suppliers including those submittals complying with unit responsibility requirements specified in applicable technical sections.

- D. The Contractor shall coordinate submittals with the work so that work will not be delayed.
- E. He shall coordinate and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another. No extension of time will be allowed because of failure to properly schedule submittals. The Contractor shall not proceed with work related to a submittal until the submittal process is complete. This requires that submittals for review and comment shall be returned to the Contractor stamped "No Exceptions Taken" or "Make Corrections Noted." The Contractor assumes the risk of expense and delays when proceeding with work that hasn't met this requirement.
- F. The Contractor shall certify on each submittal document that it has reviewed the submittal, verified field conditions, and complied with the contract documents.
- G. The Contractor shall include a copy of the applicable specification section, with addendums and all referenced sections included with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from the specification requirements. Check Marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal.

3.0 SUBMITTAL AND MATERIAL LIST

- A. Within fifteen (15) days after the Notice to Proceed, and prior to the submission of the initial shop drawings, the Contractor shall submit a draft Master Submittal List of all required submittals to the Construction Manager for favorable review. The Master Submittal List shall include a description of each item, Specification reference and the anticipated submittal date. The List shall include all items of equipment and materials for architectural, structural, mechanical, piping, electrical, heating and ventilating, equipment piping, and plumbing work; and the names of manufacturers with whom purchase orders have been placed. Items on the List shall be arranged in the same order as in these Specifications, and shall contain sufficient data to identify precisely the items of material and equipment the Contractor proposes to furnish. The List shall

reference the applicable Specification section or Drawing. After the submission is favorably reviewed and returned to the Contractor by the Construction Manager, it shall become the basis for the submission of detailed manufacturer's drawings, catalog cuts, curves, diagrams, schematics, data, and information on each separate item for review. No work shall proceed on any item until it has been submitted and favorably reviewed. An incomplete submittal list is not a basis for avoiding a submittal required by the specifications.

- B. Contractor shall submit a cash flow projection for the complete project along with their overall project schedule. Cash flow projections shall be updated with each monthly pay submittal at a minimum.

4.0 DEFINITIONS

- A. Manufacturer's Instructions: Instructions, stipulations, directions, and recommendations issued in printed form by the manufacturer of a product addressing handling, installation, erection, and application of the product; Manufacturer's Instructions are not prepared especially for the Work.
- B. Shop Drawings: Drawings, diagrams, schedules, and other data specially prepared for the Work to illustrate some portion of the Work. Shop drawings include, but not necessarily be limited to:
 - 1. Custom-prepared data such as fabrication or erection/installation (working) drawings.
 - 2. Scheduled information, setting diagrams, actual shop work manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the Work.
- C. Product Data: Illustrations, standard schedules, performance charts, brochures, diagrams and other information to illustrate materials or equipment for some portion of the Work.
 - 1. Product data as specified in individual Sections, and as applicable to the Work shall include, but not necessarily be limited to:
 - a) Standard prepared data for manufactured products (sometimes referred to as catalog data or "cuts").
 - b) Manufacturer's product specifications.
 - c) Installation instructions.
 - d) Availability of colors and patterns.
 - e) Manufacturer's printed statements of compliance and applicability.

- f) Roughing-in diagrams and templates.
 - g) Product photographs.
 - h) Standard wiring diagrams.
 - i) Performance curves and operational-range diagrams.
 - j) Production or quality control inspection and test reports and certifications, and mill reports.
 - k) Operating and maintenance instructions and recommended spare parts listing and printed product warranties.
- D. Samples: Physical examples which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged. Samples specified in individual Sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens of coordination of visual effect, graphic symbols and units of work to be used by the Engineer or others for independent inspection and testing, as applicable to the Work.

5.0 PROCEDURES

- A. The Contractor shall deliver submittals to the Construction Manager at the address provided to Contractor by the Construction Manager. The Contractor is required to allow adequate time in its project schedule for the preparation and review of the submittal to ensure that the submittal will serve its intended purpose. The Contractor is encouraged to mark the submittal “high”, “normal” or “low” priority to assist the reviewer in prioritizing the submittal reviews during periods of high volume of submissions.
- B. Transmittal Form - Unless otherwise specified, submittals regarding material and equipment shall be accompanied by a transmittal form. A separate transmittal form shall be used for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required. Submittal documents common to more than one piece of equipment shall be identified with all the appropriate equipment numbers. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole. The specification section and subsection or paragraph to which the submittal is related shall be indicated on the transmittal form.
- C. Assign each submittal a unique number. Clearly note the submittal numbers on the transmittal. Number each submittal with the identifying specification section, followed by a sequential number that represents the Contractor's assigned number of 01, 02, et cetera. Resubmittals shall be numbered by adding a dot (.) and 01, 02, 03, et cetera to the original submittal number, depending on the number of times the submittal has been resubmitted. For example: if Submittal 03300-01 requires a resubmittal, the first

resubmittal will bear the designation "03300-01.01" and the second resubmittal will bear the designation "03300-01.02" and so on.

- D. Submit specified number of copies of submittal. Should the Contractor require more returned copies of any particular submittal, the Contractor shall furnish an equal greater number of copies to the Construction Manager than is specified.
- E. Provide or furnish products and execute the Work in accordance with accepted submittals, unless in conflict with Contract Documents.
- F. Deviations From The Contract – If the submittals show any deviations from the Contract requirements, the Contractor shall submit with the submittal submission a separate written description of such deviations and the reasons therefore. If the Owner accepts such deviation, the Owner shall issue an appropriate Contract Change Order, except that, if the deviation is minor, or does not involve a change in price or in time of performance, a Change Order need not be issued. If any deviations from the Contract requirements are not noted on the submittal, the review of the shop drawing shall not constitute acceptance of such deviations.

6.0 TRAFFIC CONTROL AND PEDESTRIAN ROUTING PLAN

- A. Prepare a traffic control and pedestrian routing plan and submit to the City of Placerville and receive approval prior to starting any work.

7.0 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

- A. Submit Shop Drawings, Product Data, Samples, and other pertinent information in sufficient detail to show compliance with specified requirements.
- B. Check, verify, and revise submittals as necessary to bring them into conformance with Contract Documents and actual field conditions.
 - 1. Determine and verify quantities, dimensions, specified design and performance criteria, materials, catalog numbers, and similar data.
 - 2. Coordinate submittal with other submittals and with the requirements of the Contract Documents.
- C. Field Verification: Prior to submitting shop drawings, Contractor shall have determined and verified all field measurements, elevations, potential conflicts, quantities and dimensions. This verification may require potholing.
- D. After completion of checking, verification, and revising; stamp, sign and date submittals indicating review and approval; and submit to Construction Manager.

1. Stamp and signature indicates Contractor has satisfied shop drawing review responsibilities and constitutes Contractor's written approval of shop drawing.
 2. Shop drawings without Contractor's written approval will be returned for resubmission.
- E. Shop Drawings: Submit eight (8) copies. Three (3) will be returned with reviewer's comments and stamp.
- F. Product Data and Manufacturer's Instructions: Submit four (4) copies. Excise or cross out non-applicable information and clearly mark applicable information with citations to and terminology consistent with Contract Documents.
1. One (1) copy will be returned with reviewer's comments and stamp.
- G. Samples: Submit two (2) samples labeled with reference to applicable Contract Documents. Label will be returned with reviewer's selection when appropriate, comments and stamp. Samples will not be returned unless return is requested in writing and additional sample is submitted.
- H. Special Samples: Submit one (1) sample labeled with reference to applicable Contract Documents. Sample and one (1) label will be returned for installation in the Work.

8.0 MANUFACTURER'S INSTRUCTIONS

- A. Submit manufacturer's instructions whenever made available by manufacturers and when installation, erection, or application in accordance with manufacturer's instructions is required by the Specifications. Submit manufacturer's instructions prior to installation, erection, or application of equipment and other project components. Submit manufacturer's instructions in accordance with requirements for Product Data.

9.0 ENGINEER'S REVIEW

- A. The Engineer's review of submittals shall not release Contractor from Contractor's responsibility for performance of requirements of Contract Documents. Neither shall Engineer's review release Contractor from fulfilling purpose of installation nor from Contractor's liability to replace defective work. The Contractor shall not consider submittals as Contract Documents. The purpose of submittals is to demonstrate how Contractor intends to conform to the Contract Documents and design concepts. Engineer will be entitled to rely upon the accuracy or completeness of designs, calculations, or certifications made by licensed professionals accompanying a particular

submittal whether or not a stamp or seal is required by Contract Documents or Laws and Regulations.

B. The Engineer's review of shop drawings, samples, or test procedures will be only for conformance with design concepts and for compliance with information given in Contract Documents. The Engineer's review does not extend to:

1. Accuracy of dimensions, quantities, or performance of equipment and systems designed by Contractor.
2. Contractor's means, methods, techniques, sequences, or procedures except when specified, indicated on the Drawings, or required by Contract Documents.
3. Safety precautions or programs related to safety which shall remain the sole responsibility of the Contractor.

C. Except as may be provided in subsequent specifications; a submittal will be returned within ten (10) working days. When a submittal cannot be returned within that period, Construction Manager will, within a reasonable time after receipt of the submittal, give notice of the date by which that submittal will be returned. The returned submittal shall indicate on the following actions:

1. If the review indicates that the material, equipment or work method complies with the project manual, submittal copies will be marked "NO EXCEPTIONS TAKEN." In this event, the Contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal.
2. If the review indicates limited corrections are required, copies will be marked "MAKE CORRECTIONS NOTED." The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in O&M data, a corrected copy shall be provided.
3. If the review reveals that the submittal is insufficient or contains incorrect data, copies will be marked "AMEND AND RESUBMIT." Except at its own risk, the Contractor shall not undertake work covered by this submittal until it has been revised, resubmitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."
4. If the review indicates that the material, equipment, or work method does not comply with the project manual, copies of the submittal will be marked "REJECTED - SEE REMARKS." Submittals with deviations that have not been identified clearly may be rejected. Except at its own risk, the Contractor shall not

undertake the work covered by such submittals until a new submittal is made and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

5. If the submittal information does not require a review by the Engineer, copies of the submittal will be marked "Review not Required" and will be returned without review.

10.0 REVIEW COSTS

- A. The Owner's cost for review of submittals for the same proposed materials, equipment or work shall be apportioned as follows:
 1. The cost of review of the initial submittal and the first revised submittal will be borne by the Owner.
 2. The cost to review all additional revised submittals after the first revised submittal will be charged to the Contractor. The cost of review shall include, without limitation, administrative, design and engineering activities directly related to review of submittals.
 3. If a submittal is approved and the Contractor elects to submit an alternate item for review for the same application, the Contractor shall be responsible for the review costs for the alternate submittal. The cost of review shall include, without limitation, administrative, design and engineering activities directly related to review of submittals.

11.0 SUBMITTALS FOR INFORMATION OR RECORD ONLY

- A. Where specified, the Contractor shall furnish five (5) copies of informational submittals to the Construction Manager. Incomplete or inadequate product data, test/inspection reports will be returned to the Contractor for re-submittal. The Contractor is to pay for all mill and factory tests that are required in the Contract Documents. No copies of informational submittals will be returned unless they are found to be incomplete or inadequate.

12.0 SUBSTITUTES OR "OR EQUAL" ITEMS AND PRODUCT OPTIONS

- A. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required. Unless the name designated a "sole source" and/or is followed by words indicating that no substitution is permitted, materials, or equipment of other Suppliers may be accepted by Engineer if sufficient information is submitted by Contractor to allow Engineer to determine that the material or equipment proposed is equivalent or equal to that named.

- B. The procedure for review by Engineer will include the following as may also be supplemented in the Contract Documents. Requirements for review of substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor. If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall make written application to the Construction Manager for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice Contractor's achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for Work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair, and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by Engineer in evaluating the proposed substitute. The Owner may require Contractor to furnish at Contractor's expense additional data about the proposed substitute.
- C. If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to Engineer, if Contractor submits sufficient information to allow Engineer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by Engineer will be similar to that provided in Section 01330 – Submittals.
- D. All requests for substitution shall be submitted within thirty-five (35) calendar days after award of the contract. The Engineer will be allowed a reasonable time within which to evaluate each proposed substitute. The Engineer and Owner will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without Engineer's prior written acceptance that will be evidenced by either a Change Order or an accepted Shop Drawing. Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute. Contractor shall pay all costs for redesign required by the implementation of the proposed substitute.

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SECTION 01340
REQUESTS FOR INFORMATION AND CLARIFICATIONS

1.0 GENERAL

- A. Should the Contractor discover conflicts, omissions, or errors in the Contract Documents, or have any questions concerning interpretation or clarification of the Contract Documents, or if it appears to the contractor that work to be done or any matter relative thereto are not sufficiently detailed or explained in the Contract Documents, then, before proceeding with the work affected, the Contractor shall immediately notify the Construction Manager in writing and request interpretation, clarification, or additional detailed instructions concerning the work. The Contractor shall ask for any clarification or request for information immediately upon discovery, but no less than fifteen (15) days prior to the start date of the activities related to the clarification, based on the latest updated and accepted construction schedule. Contractor shall be responsible for its costs to implement and administer RFI's throughout the Contract duration. Regardless of the number of RFI's submitted, Contractor will not be entitled to additional compensation.
- B. A RFI is not to be used for request for materials/equipment substitutions or value engineering/cost reduction incentive proposals.

2.0 RFI PROCEDURES

2.1 Contractor Review and Submittal

- A. Contractor's review

Before submitting each RFI, the Contractor shall carefully review the following for relevant information:

1. All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto.
2. All materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work.
3. All information relative to means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto.
4. The coordination of each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.
5. The Contract Documents.
6. The Project correspondence and documentation.

- B. Submittal requests

1. The Contractor shall submit all requests for clarification and/or additional information in writing through the Construction Manager to the Engineer using a request for information (RFI) form. Contractor shall provide a detailed written statement that indicates the specific Drawings or Specifications in need of clarification and the nature of the clarification requested.
2. Contractor shall furnish six (6) copies of each RFI. Digital copies shall also be submitted. With prior approval from the Construction Manager the Contractor may submit electronic copies only. Each RFI shall be dated and bear a signed certification that Contractor has performed the review defined above. No consideration for review by Construction Manager of any RFI will be made for any item which has not been certified by the Contractor. All non-certified RFI's will be returned to Contractor without action taken by Engineer, and any delays caused thereby shall be the total responsibility of Contractor.
3. Each RFI shall be limited to one subject.

2.2 RFI Numbering System

- A. The Construction Manager will assign blocks of numbers for the Contractor, Engineer, Owner's Representative, and for substitutions. The Contractor will use the block of numbers consecutively with the date of issue, except for re-issuance of a respective RFI in which the subscript A, B, C, etc., will be added until the RFI is resolved. If Contractor believes the RFI reviewer's response is incomplete, Contractor shall issue another RFI (with the same RFI number with the letter "A" indicating if it is a follow-up RFI) to Construction Manager clarifying original RFI. Additionally, Construction Manager may return RFI requesting additional information should original RFI be inadequate in describing condition.

2.3 Owner's RFI Review and Response Time

- A. Except as may otherwise be provided herein, the Construction Manager will return one copy of each RFI form to Contractor, with its comments noted thereon or on a separate comment sheet, within a reasonable amount of time, but no more than fifteen (15) calendar days following their receipt from Contractor, or if it is necessary to extend this period, the Construction Manager shall notify the Contractor in writing as to when a decision will be provided.
- B. Engineer's review will be only to provide clarification and interpretation of the Contract Documents. Engineer's review shall not relieve Contractor for the responsibility for compliance with the Contract Documents.
- C. Engineer's review will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto.
- D. The Engineer may furnish additional detailed written instructions to further explain the work, and such instructions shall be a part of the contract documents.

Clarifications will be issued using the above RFI system and a Field Directive as necessary. Should additional detailed instructions in the opinion of the Contractor constitute work in excess of the scope of the contract, the Contractor shall submit notification immediately and written notification thereof to the Construction Manager no more than seven (7) days following receipt of such instruction, and in any event prior to the commencement of work thereon. If the Construction Manager considers it justified, the instructions of the Engineer will be revised or a proposed change order will be issued for the Owner's consideration. The Contractor shall have no claim for additional compensation or extension of the schedule because of any such additional instructions unless the Contractor provides the Construction Manager written notice thereof within the time frame specified above. In addition, the Contractor shall within fifteen (15) days from the date of notification provide detailed justification and analysis as well as complete pricing and schedule CPM fragmentary network to support any request for time extension.

- E. Should the Contractor proceed with the work affected before receipt of a response from the Construction Manager, any portion of the work which is not done in accordance with the Owner's interpretation, clarifications, instructions, or decisions subject to removal or replacement and the Contractor shall be responsible for all losses.
- F. RFI's will not be recognized or accepted, if in the opinion of the Construction Manager or Engineer, that one of the following conditions exists:
 - 1. The Contractor submits an RFI as a submittal.
 - 2. The Contractor submits the RFI under the pretense of a contract documents discrepancy or omission without thoroughly reviewing the documents. In this case, the Contractor shall be responsible for both the Construction Manager's and Engineer's administrative costs to process the RFI. Such costs will be deducted from Contractor's progress payments.
 - 3. The Contractor submits the RFI in a manner that suggests that specific portions of the contract documents are assumed to be excluded, or be taken as an isolated portion of the contract documents in part rather than whole.
 - 4. The Contractor submits an RFI in an untimely manner without proper coordination and scheduling of work or related trades.
- G. The Engineer's review shall not relieve Contractor from the entire responsibility for any variation from the requirements of the Contract Documents unless Contractor has in writing called attention to each such variation at the time of each RFI submittal and Engineer has given written approval of each such variation by specific written notation thereof incorporated in the RFI review; nor will any review by Engineer relieve Contractor from responsibility for compliance with the requirements for careful review above.

*****END OF SECTION*****

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SECTION 01354 HAZARDOUS MATERIAL PROCEDURES

1.0 GENERAL

This section includes procedures required when encountering hazardous materials at the Work site.

2.0 REFERENCES

- A. California Health and Safety Code, Section 25117.
- B. State of California Code of Regulations (CCR).
 - 1. Title 8. Industrial Relations.
 - a. Division 1. Department of Industrial Relations.
 - 2. Title 22. Social Security
 - a. Division 4. Environmental Health.
 - b. Division 4.5. Environmental Health Standards for the Management of Hazardous Waste.
- C. United States Code of Federal Regulation (CFR), Title 29 and Title 40.
 - 1. 29 CFR 1910.1000.
 - 2. 29 CFR 1910.134.

3.0 SUBMITTALS

Submit laboratory reports, hazardous material removal plans, and certifications.

4.0 HAZARDOUS MATERIALS PROCEDURES

- A. Hazardous materials are those defined by the State of California Health and Safety Code, Section 25117.
- B. When Hazardous Materials Including Contaminated Soil Have Been Found:
 - 1. Initiate Contaminated Soil Management Plan found in Appendix F of these specifications.
 - 2. Notify immediately Construction Manager, and other affected persons.
 - 3. Notify such agencies as are required to be notified by Laws and Regulations with the times stipulated by such Laws and Regulations.

4. Designate a Certified Industrial Hygienist to issue pertinent instructions and recommendations for protection of workers and other affected persons' health and safety.
 5. Identify and contact subcontractors and licensed personnel qualified to undertake storage, removal, transportation, disposal, and other remedial work required by, and in accordance with laws and regulations.
- C. Forward to Construction Manager, copies of reports, permits, receipts, and other documentation related to remedial work.
 - D. Assume responsibility for worker health and safety, including health and safety of Subcontractors and their workers.
 1. Instruct workers on recognition and reporting of materials that may be hazardous.
 - E. File requests for adjustments to Contract Times and Contract Price due to the finding of Hazardous Materials in the Work site in accordance with Section 00700.
 1. Minimize delays by continuing performance of the Work in areas not affected by hazardous materials operations.

5.0 ASBESTOS MATERIALS

- A. It is the specific intent of these Contract Documents to exclude from the Work any and all products or materials containing asbestos. No new products containing asbestos shall be incorporated in the Work.
- B. The Contractor is made aware that the existing water and sewer pipelines in the project area are made of Asbestos Concrete (AC). The Contractor shall anticipate the need for removal of sections of the existing pipeline during tie-ins to the existing system and abandonment of the existing pipelines where indicated on the plans.
- C. All Asbestos Concrete (AC) Pipe shall be handled and disposed of according to California Code of Regulations (CCR) Title 8, Section 1529; or most current regulations. Contractor shall provide a plan for disposal of the AC pipe and provide evidence of proper disposal to the Construction Manager.

*****END OF SECTION*****

SECTION 01360 ENVIRONMENTAL CONTROLS

1.0 SITE MAINTENANCE

The Contractor shall keep the work site, staging areas, and Contractor's facilities clean and free from rubbish and debris and shall comply with the requirements of Section 01090- 3.0, **STORMWATER QUALITY CONTROLS** and the Water Pollution Control Plan. Materials and equipment shall be removed from the site when they are no longer necessary. Upon completion of the work and before final acceptance, the work site shall be cleared of equipment, unused materials, and rubbish to present a clean and neat appearance.

A. Cleanup

1. Waste material of any kind will not be permitted to remain on the site of the work or on adjacent streets. Immediately upon such materials becoming unfit for use in the work, they shall be collected, carried off the site and disposed of by the Contractor. In general, the site shall be maintained on a daily and weekly basis.
2. The Contractor shall keep all buildings occupied by the Contractor clear of all refuse, rubbish and debris that may accumulate from any source and shall keep them in a neat condition to the satisfaction of the City Representative.
3. In the event that waste material, refuse, debris and/or rubbish are not so removed from the work by the Contractor, the Owner reserves the right to have the waste material, refuse, debris and/or rubbish removed and the expense of the removal and disposal charged to the Contractor.
4. Paints, solvents, and other construction materials shall be handled with care to prevent entry of contaminants into storm drains, surface waters, or soils.

B. Street cleaning

1. The Contractor shall be responsible for preventing dirt and dust from escaping from trucks departing the project site, by covering dusty loads, washing truck tires before leaving the site, or other reasonable methods.
2. When working dump trucks and/or other equipment on paved streets and roadways, the Contractor will be required to clean said streets as required by the City Representative to remove dirt caused by the Contractor's activities. The use of water in amounts, which result in mud on public streets, is not acceptable as a substitute for sweeping or other methods. Equipment for this operation shall be on the job site or available at all times.
3. In the event that the above requirements are violated and no action is taken by the Contractor after notification of infraction by the City Representative, the Owner reserves the right to have the streets in

question cleaned by others and the expense of the operation charged to the Contractor.

C. Final Cleanup

1. Before final inspection, the project site shall be neat and presentable. At a minimum dispose of:
 - a. Rubbish and debris
 - b. Excess materials
 - c. Falsework
 - d. Temporary structures
 - e. Equipment
- D. Do not remove warning, regulatory, or guide signs until Contract acceptance unless otherwise directed by the Engineer.

2.0 FUGITIVE DUST PREVENTION AND CONTROL PLAN:

1. The project shall comply with El Dorado AQMD Rule 223 – Fugitive Dust.
2. Describe proposed Best Management Practices (BMPs) to be implemented for the control of fugitive dusts.
3. Submit prior to initiation of dust creating construction activities.
4. Submit daily records of measures taken to control fugitive dust on weekly basis.

3.0 AIR POLLUTION CONTROL

- A. All fuel combustion construction equipment (both stationary and mobile) shall be tuned for optimal performance during construction activities.
- B. To the extent possible, Contractor shall implement the following measures:
 1. Contractor shall ensure that all equipment used during construction is of 2010 model or later.
 2. Retard diesel engine injection timing by two to four degrees.
 3. Use electricity from power poles rather than by temporary gasoline or diesel generators.
 4. Use reformulated, low-emission diesel fuel with less than 15 PPM sulfur in all diesel engines to comply with El Dorado County Guide to Air Quality Assessment. The use of the Best Available Control Technologies will reduce the health impact of diesel exhaust particulates.
 5. Use catalytic converters on gasoline-powered equipment.
 6. Do not leave inactive construction equipment idling for prolonged periods (i.e., more than two 2 minutes).
 7. Schedule construction activities and material hauls that affect flow to off-peak hours.
 8. Configure construction parking to minimize traffic interference.
- C. Comply with El Dorado County APCD Rule 224 - Cutback and Emulsified Asphalt Paving Materials.

4.0 ASBESTOS DUST MITIGATION PLAN:

- A. Naturally occurring asbestos (NOA):
 1. Contractor is made aware that rock found on this site may contain asbestos.
 2. If NOA is identified in the course of construction, the Contractor shall:

- a. Notify the Engineer immediately.
 - b. Prepare and submit an Asbestos Dust Mitigation Plan pursuant to CCR Title 17 Section 93105 ("Asbestos Airborne Toxic Control Measures for Construction, Grading, Quarrying, and Surface Mining Operations"). The Plan shall include all measures required by the State of California and the El Dorado County AQMD Rule 223-2.
 - c. Obtain El Dorado County AQMD approval of the Asbestos Dust Mitigation Plan before earthwork restarts.
 - d. Comply with all requirements outlined in California Air Resources Board "Asbestos Air Toxic Control Measures for Construction, Grading, Quarrying and Surface Mining Operations."
 - e. If asbestos is found in concentrations greater than 5 percent, the material shall not be used as surfacing material as stated in State Regulation CCR Title 17 Section 93106 ("Asbestos Airborne Toxic Control Measure-Asbestos Containing Serpentine"). The material containing NOA can be reused at the site for subgrade material covered by other non-asbestos-containing material
3. Contractor shall include all costs necessary to comply with these standards in the bid.

5.0 NOISE CONTROL

- A. The Contractor shall comply with applicable laws, regulations, and ordinances which apply to any work performed pursuant to the contract. If the requirements of this Section are more restrictive than those of the local regulations, the requirements of this Section shall govern.
- B. Contractor shall comply with City of Placerville noise ordinances.
- C. Each internal combustion engine, used for any purpose on the job or related to the job, shall be enclosed and 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 and enclosure. Use "quiet package" or "hush" equipment which is readily available for such equipment as trailer-mounted compressors, generators, welders, etc. All equipment shall be operated in the quietest manner practicable.
- D. Contractor shall be required to locate all fixed construction equipment such as compressors and generators as far as feasibly possible from sensitive receptors. Contractor shall shroud or shield all impact tools.
- E. Where possible, the Contractor shall use electric rather than diesel or gas-powered equipment.
- F. There shall be no start-up of machines or equipment, no delivery of materials or equipment, no cleaning of machines or equipment and no servicing of equipment except during the permitted hours of construction involving noisy operations.
- G. Amplified sound and other forms of loud communication constituting a nuisance, at the sole discretion of the City Representative, shall not be permitted.
- H. Material stockpiles and/or vehicle staging areas shall be located as far

as practicable from dwellings.

- I. The Contractor shall designate a disturbance coordinator responsible for responding to noise complaints. The name and telephone number of the coordinator shall be clearly posted at the construction site. The disturbance coordinator shall determine causes and implement measures to mitigate the noise impact, including the enforcement of the allowable hours of construction, the identification of poorly muffled equipment and requiring its repair or replacement; and recommending temporary construction noise barriers.
- J. If acceptable noise levels for a residential area are exceeded (as defined in 3.03 and 3.04 below) the Contractor shall be responsible for providing sound walls or other means necessary to reduce the noise level.

5.01 SOUND LEVEL MEASUREMENT

- A. Any sound level measurement made pursuant to the provisions of this chapter shall be measured with a sound level meter using the "A"- weighting and response. "A-weighted sound pressure level" means the sound pressure level as measured with a sound meter using the "A"-weighting network. The standard notation is dBA.

5.02 NOISE MEASUREMENT PROCEDURES

The following procedures shall be utilized for measuring and evaluating exterior noise in the project area unless otherwise specified:

- A. Noise measurements shall be conducted any time during the day or night when the suspect noise source is in operation.
- B. The location selected for noise measurement shall be on the noise receptor's property line at a point approximately ten feet from any building, wall or obstruction (trees, bushes, etc.)
- C. No individual other than the operator shall be within ten feet of the sound level meter during the measurement period.
- D. The sound level meter shall be calibrated in accordance with the manufacturer's instructions.
- E. With the noise source in operation, the operator shall record the instantaneous response at fifteen-second intervals or less, for a period of fifteen minutes or greater. Or, for a noise source in operation for less than fifteen minutes, the operator shall record the instantaneous response at fifteen-second intervals or less for the time the noise source is in operation.
- F. The suspect noise source shall only be measured for a violation of this ordinance when it is five dBA or greater than another noise source within the measurement vicinity.
- G. The corrective factors set forth in Section 3.04 shall be applied to the noise standard established for the specific noise zone.
- H. The suspect noise level shall be compared with the standards in Section 3.03.
- I. If the noise level generated from the suspect noise source exceeds the standard, the suspect noise source shall be considered to be in violation of this chapter.

5.03 ALLOWABLE NOISE LEVELS

Noise received on property occupied by another person within the project area, in excess of the following levels shall not be allowed, except as expressly provided otherwise herein:

STANDARDS

	Day	Night
Zone	7:00 A.M.- 9:00 P.M.	9:00 P.M.- 7:00 A.M.
Residential	55 dBA	45 dBA

1.02 5.04 CORRECTIONS TO NOISE LIMITS.

The numerical limits given above shall be adjusted by the following corrections, where appropriate:

	Noise Condition	Correction (in dB)
1	Repetitive impulsive noise, pure tones and sound with cyclically varying amplitude	-5
2	Steady whine, screech or hum	-5
The following corrections apply to day only:		
3	Noise occurring more than 5 but less than 15 minutes per hour	+5
4	Noise occurring more than 1 but less than 5 minutes per hour	+10
5	Noise occurring less than 1 minute per hour	+15

6.0 TREE AND PLANT PROTECTION

A. Temporary tree protection

1. The Contractor shall carefully protect existing trees from damage by construction activities. No trees outside the construction limits shall be removed or damaged, unless authorized by the City Representative.
2. If a tree is damaged or destroyed by construction (other than those designated for removal), the Contractor shall replace it in species, size and grade with a healthy tree as directed by the City Representative. Where it is necessary to replace a tree damaged by construction, the Contractor shall bear all expenses required to establish the replacement tree and paying El Dorado County tree removal fees.

B. Cultivated areas and other surface improvements:

All landscaped areas and other surface improvements which are damaged by actions of the Contractor shall be restored. The Contractor shall minimize vegetation removal. Areas shall not be cleared until construction activities require the work. Erosion controls shall be in place prior to clearing and grading activities.

- C. Other areas to be protected:
Environmentally sensitive areas are indicated on the Drawings. The Contractor shall erect a protective fence around the area to be protected. The protective fence shall be 4 feet tall, international orange high density polyethylene resin (Visi-Barrier or equal). Posts shall be heavy duty steel T-posts with corrosion resistant coating spaced at 5 feet on centers.

7.0 WATER CONTROL

- A. Temporary pumping and drainage
1. The Contractor shall conform to the regulations and requirements of legally authorized surface water management agencies.
 2. The Contractor shall be responsible for keeping trenches and other areas free from water as required to permit continuous progress of, or to prevent damage to, its own work or the work of others. The Contractor's operations shall be conducted in such a manner as to prevent sediment from reaching existing sewers, storm drains, and creeks.
 3. The Contractor shall cover exposed excavated areas and spoils piles when runoff from rain is or would be likely to cause turbidity to enter local waterways. The Contractor shall suspend work in the rain if such work cannot be performed without causing turbid runoff.
 4. To avoid solids or turbid runoff from entering local waterways, the Contractor shall cover, secure, and/or berm excavated area and spoils piles and employ other methods as necessary such as hay bale around storm drains or around construction sites; use of cut and cover construction method; or use of sedimentation basins.
 5. The Contractor shall be responsible for providing and maintaining means and devices to remove and properly dispose of all construction, flushing, and testing water.
- B. WATER QUALITY MEASURES:
1. Erosion control measures, such as silt fences, filter fabric, sedimentation ponds, placement of hay bales along the peripheries of construction sites, temporary detention ponds, and terraced slopes, shall be employed as appropriate in conformance with the approved Storm Water Pollution Prevention Plan (SWPPP) or Water Pollution Control Plan (WPCP) and shall be in place prior to any clearing or grading activity.

8.0 OIL SPILL PREVENTION AND CONTROL

A. General

The Contractor shall be responsible for prevention, containment, and cleanup of spilling of oil, fuel, and other petroleum products used in the Contractor's operations. All such prevention, containment, and cleanup costs shall be borne by the Contractor. The Contractor shall not discharge oil, fuel, or other petroleum products from equipment or facilities into surrounding waters or onto adjacent land.

B. Spill mitigation measures

The Contractor shall, at a minimum, take the following measures regarding oil spill prevention, containment, and cleanup:

1. Fuel hoses, lubrication equipment, hydraulically operated equipment, oil drums, and other equipment and facilities shall be inspected regularly for drips, leaks, or signs of damage, and shall be maintained and stored properly to prevent spills. Proper security shall be maintained to discourage vandalism.
2. All land-based oil and products storage tanks shall be diked or located so as to prevent spills from escaping to the water. Diking and subsoils shall be lined with impervious material to prevent oil from seeping through the ground and dikes.
3. All visible oils on land shall be immediately contained using dikes, straw bales, or other appropriate means and removed using sand, ground clay, sawdust, or other absorbent material, which shall then be properly disposed of by the Contractor. Waste materials shall be temporarily stored in drums or other leakproof containers after cleanup and during transport to disposal. Waste material shall be disposed off property at an approved site.

9.0 DISCOVERY OF CULTURAL RESOURCES

If discovery is made of items of historical archaeological or paleontological interest, the Contractor is to immediately cease all Work in the area of discovery and promptly notify the City Representative. Archaeological indicators may include, but are not limited to, dwelling sites, locally darkened soils, stone implements or other artifacts, fragments of glass or ceramics, animal bones, human bones and fossils. Do not resume Work in the area of discovery until authorization is received from the City Representative. When work is resumed, excavation or other activities shall be as directed by the City Representative. If the discovery of cultural resources causes a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work the Owner shall cause to be issued a change order under the procedures provided in Section 00700.

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SECTION 01380 PHOTOGRAPHS

PART 1. GENERAL

1.01 DESCRIPTION

- A. Construction photography is required to document: pre-construction conditions, construction activities, and post-construction conditions. Photographs will be particularly useful in documenting the pre-construction conditions of yards, landscaping, streets, etc.

1.02 RELATED REQUIREMENTS

- A. General Conditions
- B. Special Provisions

1.03 USE OF PHOTOGRAPHY

- A. Pre-Construction photography will be used in part to establish pre-construction conditions. Disputes with property owners will be settled through the use of construction photos that will document pre-construction conditions. In the event that the Contractor fails to adequately document pre-construction conditions, the Contractor will be obligated to restore disputed landscaping, yards improvements, etc. to the satisfaction of the property owner.

PART 2. PRODUCTS

2.01 FORMAT

- A. Format of the photography shall be as follows:
 - 1. All photographs shall be in digital format with date stamp, delivered to the City on CD-ROM/DVD.
 - 2. Photographs shall be color photos with a minimum resolution of 1760x1168 pixels. Image storage size shall not exceed 250 KB per image.
 - 3. Video shall be in digital format with date stamp on a CD-ROM/DVD.

2.02 DATABASE

- A. The photos shall be displayed in a table, (MS-Excel) that will be used for indexing digital photographs. The table shall have the following fields: address, pre-construction photographs (will be multiple records), construction photographs (will be multiple records), and post-construction photographs (will be multiple records).
- B. The Contractor shall populate the table fields indicated with links to the digital photos that correspond to each residence affected by the project as well as public rights-of-way as necessary.

PART 3. EXECUTION

3.01 PRE-CONSTRUCTION DOCUMENTATION

- A. Prior to construction, the Contractor will document the conditions of all surface features of the affected areas. This documentation shall be in the form of both DVD and still digital photographs.
- B. The Contractor is obligated to document the Pre-Construction conditions sufficiently to avoid disputes with property owners regarding the quality of post-construction repairs.
- C. The photographer shall use signs in each photograph that clearly identify each photo by address.
- D. Pre-Construction video coverage shall include (at a minimum):
 - 1. The ground surface above all pipes to be replaced.
 - 2. All driveways in the project vicinity on which construction equipment may access.
 - 3. All curb, gutter and sidewalk, and other surface features in the project vicinity that construction equipment might damage.
- E. Submit one pre-construction video to the City prior to beginning construction. Video shall be labeled with the title, "Pre-Construction Video", the name of the project, name of the Contractor, and date(s) of videotaping. The video photographer should include enough narrative to let a viewer know the time, date, and location of each separate area shown.
- F. Pre-Construction photographs shall include a minimum of two photos from all residential yards that will be excavated. Photos should focus on areas that will be disturbed by the work.
- G. Prior to the beginning of construction, the Contractor shall submit to the Engineer CD's with the following information:
 - 1. Photography table with links to color photographs for each address. Only links to pre-construction photographs are required to be completed at this time.
 - 2. A CD label with project title, photographs included, and Contractor name.

3.02 CONSTRUCTION PHOTOGRAPHS

- A. The Contractor shall use construction photographs to document the progress of construction activities. The Contractor should use construction photographs to document unusual situations, repairs made to buried improvements, accidents, construction disputes, and any other conditions that may be useful in the future. The use of construction photographs should be for the Contractor's benefit to document work completed.
- B. The Contractor shall supply photographs each time a gas line or telecommunications line is exposed with location and details of the condition noted.

3.03 POST CONSTRUCTION DOCUMENTATION

- A. Provide Post-Construction photographs. Post-Construction photographs will include photos of the completed and repaired work areas. Photos will include enough detail to demonstrate that the Contractor has performed repair and clean-up work. At a minimum, each site that was photographed for a pre-construction photo shall be re-photographed for the post-construction documentation.
- B. Following completion of construction, the Contractor shall submit to the City CD's with the following information:
 - 1. Photography table with links to color photographs for each location. Links to pre-construction photographs, construction photographs, and post-construction photographs are all required to be completed at this time. This final CD is to replace all CDs previously submitted to the City.
 - 2. A CD label with project title, photographs included, and Contractor name.
 - 3. If multiple CDs are required to hold the required information, each CD label shall include numbering to indicate the CD number and the total number of CDs in the set (i.e., 1 of 3).
- C. Post-Construction video shall be made that documents the post-construction conditions of the project sites. Again, the video should include footage of all areas shown in the pre-construction video. Also, the video should include any sensitive areas as indicated by property owner's feedback and concerns.
- D. Submit one copy of each post-construction video to the Engineer immediately following completion of the work and prior to the final payment. Video shall be labeled with title, "Post-Construction Video", the name of the project, name of the Contractor, and date(s) of videotaping. The video photographer should include enough narrative to let a viewer know the time, date and location of each separate area shown.

****END OF SECTION****

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SECTION 01400
QUALITY CONTROL AND INSPECTION

1.0 CONTRACTOR'S QUALITY CONTROL

1.1 General

The Contractor is to ensure that products, services, workmanship and Site conditions comply with the requirements of the Contract Documents by coordinating, supervising, testing and inspecting its Work. The Contractor shall utilize only suitably qualified, skilled and trained personnel experienced in the tasks required to complete the Work in accordance with the quality requirements of the Contract Documents. Should there be no quality basis specifically prescribed for any portion of the Work, the quality and testing procedures shall be in accordance with the best-accepted practices of the construction industry for the locale of the Project, for projects of this type, or standards set by engineering or technical societies (e.g. ASTM or ASHRAE), whichever is more stringent.

1.2 Quality of Work

The Contractor's quality of Work shall include, but not be limited to, the following requirements:

- A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects, and fit for the intended use.
- B. Quality of installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements, as shown on or required by Contract Documents.
- C. Protection of Completed Work: Take all measures necessary to preserve completed Work free from damage, deterioration, soiling, and staining, until acceptance by Owner.
- D. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report requirements in preparing, fabricating, erecting, installing, applying, connecting, and finishing Work.
- E. Deviations from Standards and Code Compliance and Manufacturer's instructions and Recommendations: Secure Owner's advanced written consent. Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.
- F. Verification of Quality: Work shall be subject to verification of quality by Owner in accordance with provisions of the Contract Documents.

1.3 Defective Work

Defective Work shall be modified, replaced, repaired or redone by the Contractor at no change in Contract Sum or Contract Time. Acceptance of Defective Work, without specific written acknowledgement and approval of Owner, shall not relieve the Contractor of the obligation to correct such Work. Should Owner determine that it is not feasible or in Owner's interest to require Defective Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between Owner and Contractor. If equitable amount cannot be agreed upon, a Construction Change Directive will be issued and the amount in dispute resolved in accordance with the Contract Documents. Owner and Owner's consultants disclaim any and all responsibility for Work produced not in conformance with the Drawings and Specifications. Contractor shall have full responsibility for all consequences resulting from Defective Work, including without limitation all delays, disruptions, extra inspection and correction costs by Contractor and Owner and re-Work, and extra time and costs of all types. Contractor waives excuses for defective work relating to Owner's prior review of Submittals and/or prior failure to notice Defective Work in place on inspection.

2.0 INSPECTION AND TESTING

Additional requirements for tests are described in Sections 02660 – Water Piping System Testing & 02661 - Disinfecting Water Mains in these Contract Documents.

2.1 General

Where the Contract Documents require work to be field tested or approved, it shall be tested in the presence of the Construction Manager or its authorized representative. The Construction Manager shall have the right to witness all on-site tests performed by the Contractor and any shop tests. The results of any tests performed by the Contractor shall be made available for the information of the Construction Manager. Inspections, tests or favorable reviews by the Construction Manager or others shall not relieve the Contractor from its obligation to perform the work in accordance with the requirements of the Contract Documents or for its sole responsibility for the quality of workmanship and materials.

Except as specifically required under the technical specifications for testing and inspection, all tests for materials furnished by the Contractor will be done in accordance with commonly recognized standards of national organizations. Where tests are to be performed by the Construction Manager or by an independent laboratory or agency, the Contractor shall furnish such samples of all materials as required by the Construction Manager without charge. The sample or samples of materials to be tested shall be selected by such laboratory or agency, or the Construction Manager, and not by the Contractor. No material for which the Contract Documents require the submittal and approval of tests, certificates of compliance or other documentation shall be incorporated in the Work until such submittal has been made and approved. The Contractor shall provide safe access, including plants where materials or equipment are manufactured or fabricated, for the Construction Manager and inspectors to adequately inspect the quality of work and the conformance with the Contract Documents. The Contractor shall furnish the Construction Manager the necessary labor and facilities for such things as excavation in the compacted fill to the depths required to take samples. The Contractor shall provide adequate lighting, ventilation, ladders and other protective facilities as may be necessary for the safe performance of inspections.

Upon completion of the Work the Construction Manager will conduct a final inspection as provided for in Section 00700. Records shall be available at all reasonable hours for

inspection by other local or State agencies to ascertain compliance with laws and regulations.

Neither the employment of independent testing and inspection agency nor observations or tests by Owner and Owner's consultants shall in any manner relieve the Contractor of obligation to perform Work in full conformance to all requirements of the Contract Documents. The Owner reserves the right to reject all Work not in conformance to the requirements of the Contract Documents, or otherwise Defective.

2.2 Notice

The Contractor shall notify the Construction Manager in writing at least twenty-four (24) hours before any field testing or special inspections are required to be performed by the Construction Manager or independent laboratory furnished by the Owner. The Contractor shall notify the Construction Manager at least two hours before any inspection is required to be performed or to witness the Contractor's on-site field testing.

Whenever the Contractor varies the period during which work is carried on each day, the Contractor shall give due notice to the Construction Manager so that proper inspection may be provided. Any work done in the absence of the Construction Manager shall be considered to be rejected. It will be the responsibility of the Contractor to demonstrate to the satisfaction the Construction Manager that the work meets all conditions of the specification and if such conditions are not met to remove the work.

The Contractor shall give the Construction Manager written notification at least thirty (30) days prior to the shipment of materials and equipment to be tested and/or inspected at the point of origin. Satisfactory tests and inspections at the point of origin shall not be construed as a final acceptance of the materials and equipment nor shall such tests and inspections preclude retesting or reinspection at the site of the Work.

2.3 Costs of Testing

The Contractor shall be responsible for, and shall pay for, all quality control and off-site tests of materials required including all source and mix design tests for the approval of soil and concrete materials. The Owner will perform the soils and concrete confirmation tests detailed in the Technical Specifications during the performance of the Work. Owner will retain and pay a qualified testing agency to perform soil compaction testing and work identified as requiring special inspections and testing as defined by UBC section 1701. All other testing required by the technical specifications shall be the responsibility of the Contractor.

The Contractor shall be responsible for, and shall pay for, all source quality control and all on-site tests of materials required, except those tests specifically noted to be performed and paid for by the Owner.

The Construction Manager shall have the authority to require additional tests or inspections due to the manner in which the Contractor executes its work. Examples of such additional tests and inspections include; tests of materials substituted for previously accepted materials, or substituted for specified materials, or retests made necessary by failure of material to comply with the requirements of the Specifications. Where such tests and inspections are required by Contract to be performed by the Owner, the Owner will pay for

the additional tests and inspections but will issue an unilateral Change Order to deduct these costs from the Contract price.

2.4 Work Covered Prior to Inspection and/or Testing

Work requiring inspection and/or testing shall not be concealed or buried prior to the acceptance of such inspection or testing. Work covered without the favorable review or consent of the Construction Manager shall, if required by the Construction Manager, be uncovered for inspection and/or testing at the Contractor's expense.

2.5 Work Covered With Prior Inspection and/or Testing

If the Construction Manager considers it necessary or advisable that covered work which was favorably inspected and tested be uncovered for reinspection and/or retesting, the Contractor, at the Construction Manager's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Construction Manager may require, that portion of the work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such work is defective, the Contractor will bear all expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such work is not found to be defective the Contractor will be allowed an increase in the Contract price or an extension of the Contract time, or both, directly attributable to such uncovering, exposure, observation, testing and reconstruction, and a Change Order shall be issued for such additional work.

2.6 Coordination of Caltrans and Other Inspections

The Contractor is completely responsible for scheduling all Caltrans and any other agency inspections in accordance with Caltrans and agency requirements. The Contractor shall notify the Construction Manager of all work component inspection notices and schedules. Failure of the Contractor to properly coordinate and schedule these inspections shall not be cause for time extensions.

2.7 Special Tests and Inspections

As provided for in the Contract Documents, laws and regulations, specialized tests and inspections shall be performed by special inspectors certified by the International Conference of Building Officials (ICBO). Unless otherwise stated in the Contract Documents, each of these tests will be performed and paid for by the Owner.

2.8 Inspections and Tests by Serving Utilities

Unless otherwise indicated in the Contract Documents, the Contractor shall cause, schedule and conduct inspections and tests by serving Utilities required for the Work under this Contract.

2.9 Inspections and Tests by Serving Manufacturers

Unless otherwise indicated in the Contract Documents, the Contractor shall cause all required tests and inspections to be conducted by materials, equipment or systems manufacturers. Additionally, all tests and inspections required by materials, equipment or

systems manufacturers as conditions of warranty or certification of Work shall be made, the cost of which shall be included in the Contractor's bid.

3.0 TEST WATER

The Owner will furnish water for testing to the Contractor, free of charge, as is available from the City's water system. The conveyance of water shall be the responsibility of the Contractor and shall be at the Contractor's expense.

The Contractor shall submit a written request of water needs for testing including a description, volume, location and duration of use to the Construction Manager for approval. The Construction Manager will designate the type of water, locations where connections may be made and the backflow protection, if required. The Contractor is responsible for providing, installing and testing the backflow prevention device at the Contractor's expense. The Construction Manager may also require a meter on the connection depending on the volume of water requested.

There may be short periods of time when water is not available from the Owner's system.

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SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

1.0 GENERAL

This section covers the general requirements for the Contractor's temporary facilities at the job site and for the prosecution of the work. The Contractor shall be responsible for furnishing, installing and maintaining all temporary utilities required for the Work, all construction aids required for the Work, fences and barriers as required for protection of the public, property, environment and the Work, field offices and storage facilities, as specified, except as allowed herein, and removal of said items upon completion of the Work. The Contractor may use existing roadways for access and parking to the extent practical and allowable.

The empty City owned lot located at the corner of Mosquito Road and US 50 will be available for the contractor's use as a material and equipment laydown yard throughout the duration of the project.

2.0 QUALITY ASSURANCE

Contractor shall comply with applicable Federal, State, and local laws, codes, regulations and ordinances and with utility company requirements.

3.0 SUBMITTALS

Submit the following information:

1. Copies of permits and approvals for construction as required by Laws and Regulations of governing agencies.
2. Backflow prevention procedures for temporary connection to Owner's potable water system, if applicable.
3. Proposed plan and layout for all temporary offices, designated parking areas, sanitary facilities, storage yards, temporary water service and distribution, temporary sewer connection, temporary telephone service, temporary power service and distribution and temporary fire equipment access roads.

4.0 TEMPORARY UTILITIES

4.1 Utility Requirements

The Contractor shall maintain and operate the temporary utility systems to assure continuous service. The systems shall be modified and extended as Work progress requires. Temporary materials and equipment shall be completely removed when their use is no longer required. The Contractor shall clean and repair any damage caused by temporary utility installations or use.

4.2 Power

Contractor shall make arrangements for temporary power, furnish temporary power pole and meter, make temporary connection, and make arrangements and pay all costs for a temporary power supply. Contractor shall arrange for and pay all costs associated with temporary power service to the field offices and to Contractor's storage sheds, and shall pay all costs for installation and removal of temporary service and all power used.

Contractor shall pay for energy used during start-up and testing and until such time that the Owner takes beneficial occupancy of the Work or the Work is accepted by the Owner, whichever occurs first. The Owner shall arrange for and pay for all costs associated with relocation of existing utility power poles, transformers, wires and related facilities to provide and/or upgrade the permanent service to the facility.

The Contractor shall provide temporary lighting to meet applicable requirements to allow erection or installation of materials and equipment and to allow observation and inspection of the Work.

4.3 Water

Contractor shall provide bottled drinking water service for all drinking water required by construction personnel. Provide refrigerated bottled water dispensers for all trailers to be occupied by personnel. Each dispenser shall have two 3-gallon internal reservoirs and an additional 5-gallon water bottle storage. A minimum of two extra 5-gallon water bottles shall be on hand at each trailer during the duration of occupancy. The Contractor shall be responsible for paying all costs associated with supplying drinking water.

The Contractor shall provide water storage tankage as necessary for construction purposes.

4.4 Telephone

The Contractor shall provide telephone service:

1. Telephone lines and instruments for Contractors use at Contractor's option and costs.

The Contractor shall pay all costs for installation and removal of telephone lines and instruments and local telephone service. If internet access service is specified, the Contractor shall pay all costs for installation and removal and monthly ISP charges for internet service. Telephone and internet service are to be installed and ready for use within 20 days after receipt of the Notice to Proceed.

4.5 Heating and Ventilation

The Contractor shall provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate the progress of the Work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage due to temperature or humidity. Adequate forced ventilation of enclosed areas shall be provided for curing of installed materials, to disperse

humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases. Portable heaters shall be standard approved units complete with controls and suitably vented to the outside as required for protection of health and property. The Contractor shall be responsible for paying all costs of installation, fuel, maintenance, operation, and removal.

5.0 CONSTRUCTION FACILITIES

5.1 General

Temporary structures shall be structurally sound, weather tight, with floors raised above ground. Temperature transmission resistance shall be compatible with occupancy and storage requirements. At the Contractor's option, portable or mobile buildings modified for office use may be used. Existing site facilities and new permanent facilities shall not be used for construction facilities. Sites for temporary structures shall be filled and graded to provide surface drainage. Temporary structures shall be constructed on proper foundations, secured, provided with connections for utility services and provided with railed steps and landings at elevated entrance doors. Periodic maintenance and cleaning shall be provided for temporary structures, furnishings, equipment and services. Temporary structures, contents and services shall be removed when they are no longer needed for the Work. Foundations and debris shall be removed, the site graded to required elevations and the areas cleaned.

Contractor shall not use any of the Owners facilities or supplies, including telephones, sanitary facilities, trash receptacles or vehicles.

The Contractor shall, at all times, be responsible for the security of the Contractor's facilities, materials and equipment. The Owner will not be responsible for missing or damaged equipment, tools or personal belongings.

5.2 Storage Buildings

Storage buildings shall be adequate for the requirements of the various trades and shall have adequate dimensions for storage and handling of products. Ventilation shall be provided to comply with specified and code requirements for the products stored. Heating shall be provided to maintain temperatures specified in the respective sections for the products stored. Buildings shall be arranged and/or partitioned to provide security of contents and ready access for inspection and inventory. Combustible materials shall be stored in a well ventilated, remote building meeting applicable safety standards.

5.3 Sanitary Facilities

The Contractor shall provide sanitary facilities for the on-site personnel:

1. As required by laws and regulations.
2. Not less than one (1) facility per site.

3. Not less than one (1) facility for each 20 employees, or fraction thereof, of Contractor and subcontractors at the site.

Facilities and enclosures shall be serviced, cleaned and maintained on a weekly basis. The Owner's existing sanitary facilities will not be available for use by Contractor or subcontractors.

6.0 CONSTRUCTION AIDS

The Contractor shall provide construction aids and equipment required by personnel and to facilitate the execution of the Work including, but not limited to, scaffolds, staging, ladders, stairs, ramps, runways, platforms, railways, hoists, cranes, chutes and other such facilities and equipment as required. Contractor may, at his own risk, use hoists and cranes installed as part of the work, subject to the following:

1. Coordinate with Engineer and Owner.
2. Do not exceed rated capacity of hoists and cranes.
3. Replace or repair any damaged units to the satisfaction of the Owner.
4. Owner makes no representation as to the suitability, serviceability, or safety of hoists and cranes and assumes no responsibility for their safe use by the Contractor's personnel.

Construction aids shall be relocated as required by the progress of construction, by storage or work requirements, and to accommodate legitimate requirements of Owner. Temporary materials and equipment shall be completely removed at the completion of the Project. Remove foundations and underground installations for construction aids. The areas of the site affected by temporary installations shall be graded to required elevations and slopes and the area clean. The Contractor shall clean and repair damage caused by installation or by use of temporary facilities.

7.0 VEHICLE ACCESS AND PARKING

Contractor shall ensure that construction vehicles do not limited access and street parking for area residents. All efforts shall be made to minimize the number of construction vehicles on site at all times.

8.0 TEMPORARY BARRIERS AND ENCLOSURES

8.1 Barricades

The Contractor shall provide suitable barricades as required for protection of the work and protection of the public, Owner's employees, Contractor's employees and others who may be affected by the Work. The barricades shall be provided to prevent unauthorized entry to construction areas and affected roads, streets and alleyways and to protect existing facilities and adjacent property from damage. Warning lights shall be illuminated on barricades from

sunset to sunrise where required for safety. Placement of barricades shall be done in a manner that will allow Owner's personnel access to existing facilities. The barricades shall be installed in a neat manner, with a reasonable uniform appearance and structurally adequate for the required purposes. Barricades shall be relocated as required by the progress of the Work. Barricades, including foundations, shall be removed when construction has progressed to the point that they are no longer needed. The Contractor shall repair damage caused by installation, fill and grade the areas of the site to required elevations and slopes and clean the area.

9.0 TEMPORARY CONTROLS

All BMPs identified in the WPCP prepared and submitted by the Contractor shall be in place prior to the start of work.

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SECTION 01770 CLOSE OUT PROCEDURES

1.0 GENERAL

Section Includes: Contract closeout requirements including:

1. Disinfection of systems,
2. Preparation and submittal of closeout documents,
3. Final completion certification.

2.0 WASTE DISPOSAL

- A. Arrange for and dispose of surplus materials, waste products, and debris off-site.
 1. Prior to making disposal on private property, obtain written permission from Owner of such property.
- B. Do not fill ditches, washes, or drainage ways which may create drainage problems.
- C. Do not create unsightly or unsanitary nuisances during disposal operations.
- D. Maintain disposal site in safe condition and good appearance.
- E. Complete leveling and cleanup prior to final acceptance of the Work.

3.0 TOUCH-UP AND REPAIR

- A. Touch-up or repair finished surfaces on structures, equipment, fixtures, and installations that have been damaged prior to inspection for Final Acceptance.
- B. Refinish or replace entire surfaces which cannot be touched-up or repaired satisfactorily.

4.0 CLOSEOUT DOCUMENTS

- A. Submit following Closeout Submittals upon Completion and at least seven (7) days prior to submitting Application for Final Payment:
 1. Evidence of Compliance with Requirements of Governing Authorities.
 2. Project Record Documents.
 3. Operation and Maintenance Manuals.
 4. Warranties and Bonds.
 5. Keys and Keying Schedule.
 6. Evidence of Payment and Release of Liens and Stop Payment Notices as outlined in Conditions of the Contract.
 7. Release of claims as outlined in Conditions of the Contract.

8. Survey Record Documents as specified in Section 01722.
9. Certificate of Final Completion.

5.0 PROJECT RECORD DOCUMENTS

- A. Maintain at Project site, available to Owner and Construction Manager, one (1) copy of the Contract Documents, shop drawings and other submittals, in good order.
 1. Mark and record field changes and detailed information contained in submittals and change orders.
 2. Record actual depths, horizontal and vertical location of underground pipes, duct banks and other buried utilities. Reference dimensions to permanent surface features.
 3. Identify specific details of pipe connections, location of existing buried features located during excavation, and the final locations of piping, equipment, electrical conduits, manholes, and pull boxes.
 4. Identify location of spare conduits including beginning, ending and routing through pull boxes, and manholes. Record spare conductors, including number and size, within spare conduits, and filled conduits.
 5. Provide schedules, lists, layout drawings, and wiring diagrams.
 6. Make annotations with erasable colored pencil conforming to the following color code:

Additions:	Red
Deletions:	Green
Comments	Blue
Dimensions:	Graphite

- B. Maintain documents separate from those used for construction.
 1. Label documents "RECORD DOCUMENTS."
- C. Keep documents current.
 1. Record required information at the time the material and equipment is installed and before permanently concealing.
- D. Deliver record documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.
- E. Record documents shall be available for the Construction Manager to review to ascertain that changes have been recorded.
- F. Failure of the Contractor to keep current with the updating of the Record Documents shall be grounds for withholding monies from partial payment estimates as specified in Section 00700.

***** END OF SECTION *****



CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

TECHNICAL SPECIFICATIONS

OCTOBER, 2019

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**SECTION 02060
TEMPORARY TRAFFIC CONTROL**

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. This work consists of furnishing, placing, implementing, maintaining and removing the various temporary traffic control setups in accordance with the City of Placerville Standards and Caltrans Standards.
- B. The Contractor shall prepare and submit a traffic control plan to the City of Placerville and receive approval prior to starting any work.

PART 2 – PRODUCTS

2.01 GENERAL

- A. All barricades, warning signs, lights, temporary signals, and other protective devices shall conform to the provisions for Construction Signing as indicated in the "Manual on Uniform Traffic Control Devices for Streets and Highways", current edition, published by the Federal Highway Administration. Materials used for the fabrication or erection of such devices shall be approved by the City, Caltrans (within Caltrans Right-of-Way) and the Engineer before use on the project. Traffic control devices not approved by the City and/or the Engineer will not be allowed to be used on the project and their use may justify suspension of Work.
- B. All controls shall comply with the California Supplement to the Manual on Uniform Traffic Control Devices (MUTCD-CA), Part 6, most current version at time of notice to proceed.
- C. Sign Panels: Sign panels will be constructed of 3/4-inch plywood or 6061-T6 or 5052-H38 aluminum alloy sheeting conforming to ASTM 209.
 - 1. Aluminum sign panels will be 0.125 inches thick and backed with metal backing angles; except that those sign panels 48 inches by 60 inches or smaller may be:
 - a. 0.080 inches thick and backed with metal backing angles or 2-inch x 4-inch dimensional lumber or,
 - b. Unbacked 0.125 inches thick.
 - 2. Wood sign panels will be backed with metal backing angles; except that backing is not required during the construction season for those sign panels 48 inches by 60 inches or smaller.
 - 3. All sign panels installed without backing during construction will be backed as described above at the Contractor's expense prior to any suspension of work.
- D. Barrels: Barrels will be plastic conforming to the Manual on Uniform Traffic Control Devices California Supplement (MUTCD-CA), with six-inch-wide stripes.

2.02 FLAGGING

- A. The Flagging Code as adopted by the California Department of Transportation and made a part of the MUTCD-CA shall be adhered to at all times.

2.03 TRAFFIC CONTROL MAINTAINER

- A. The Contractor shall designate an individual(s) who will be responsible at all times to see that all necessary maintenance of traffic control devices is performed. The name of this individual(s) and the telephone number where this person(s) can be contacted at any time will be submitted to the Agency before implementing any temporary traffic control on the project.
- B. This individual(s) hereinafter entitled "TRAFFIC CONTROL MAINTAINER", will be responsible at all times to see that all necessary maintenance of traffic control devices is performed. Maintenance will include, but will not be limited to, the following:
 - 1. Clean all devices
 - 2. Repair, reset or replace any damaged devices
 - 3. Reset undamaged devices knocked or blown down
 - 4. Replace batteries, light bulbs, control panels, and other components of electrical devices.
 - 5. Add fuel and motor oil to engines of power generating units for electrical devices, and maintain them in good operating condition.
 - 6. Insure that all devices remain in their proper locations and are properly positioned in accordance with the traffic control plan in use.
 - 7. Implement and enforce a system of relief flagging in which every flagger shall be relieved for at least fifteen (15) minutes every four hours for the duration of their shift.

Failure of Contractor to implement a TRAFFIC CONTROL MAINTAINER or failure of Maintainer to comply with the above stipulations will be considered just cause to suspend Work. The cost for a TRAFFIC CONTROL MAINTAINER is subsidiary to other bid items.

PART 3 – EXECUTION

3.01 REQUIREMENTS

- A. Construction shall not commence on the portions of the project requiring traffic control until necessary construction warning signs are in place and approved by the Engineer.
- B. No traffic control will be paid for outside of the project limits which results from the haul of Contractor secured material sources. Such traffic control shall be approved by the Agency and adhere to the provisions for Construction Signing as indicated in the "Manual on Uniform Traffic Control Devices for Streets and Highways", current edition. This additional control will be considered subsidiary to other bid items.
- C. Contractor shall notify appropriate authorities in advance of any street closure and as required by the City approved traffic control plan. This includes

notifying the City, local media, all emergency services, all non-emergency services, such as waste collection and postal delivery, project engineer and all affected residents and businesses at least one week prior to closing any streets. Cal-trans shall be notified if the project includes or is adjacent to a road under their jurisdiction. Highways and/or streets closed to through traffic shall be protected by barricades and obstructions shall be reflectorized and illuminated during hours of darkness. All flagging stations shall be fully illuminated, if they are providing traffic control during hours of darkness.

- D. Contractor shall provide an appropriate alternate route if street closures are proposed. No closure shall be allowed if an alternate route is not available. All closures must be approved in advance by the City of Placerville and shall be limited to between the hours of 7:30am and 4:30pm to allow for ingress and egress of working residents.
- E. Reasonable access shall be maintained to local residents at all times. Collector and arterial streets shall provide local access and emergency traffic flow.
- F. Portable signs may be mounted on stands, skids, or on Barricades at the option of the Contractor. When not in use, however, signs and all mounting hardware shall be removed from edge of traveled way.
- G. If road closures are implemented this will also include all time and materials required to coordinate with the City Police and Fire Department. The Contractor is also responsible to coordinate bus service, mail delivery and garbage pick-up as applicable.
- H. The contractor must not block the movement of pedestrian or bicycle traffic. The contractor must provide for pedestrian and bicycle traffic by phasing construction operations and/or by providing alternative pedestrian and bicycle access through or adjacent to construction areas. Proper advance notice signage with reasonable detours must be installed and maintained through all phases of construction. Pedestrians must never be diverted into a portion of the street used for vehicular traffic or on to private property unless proper barriers, delineation, and adequate signage are in place. Hand railings for pedestrians must be provided when required by Americans with Disabilities Act (ADA) on each side of bridge or passageway to protect pedestrians from hazards caused by construction operations or adjacent vehicular traffic.
- I. The contractor must notify, in writing, residents and business establishments along the route of the work at least 10 working days prior to road closures and at least 3 working days prior to placing parking restrictions or planned disruption of any ingress and/or egress. The notice provided to the residences and businesses must include, at a minimum, a schedule of closures with estimated closure times, the closure location, and alternate route or detour, and the name and 24-hour phone number of a contract person employed by the contractor.
- J. Safe and passable pedestrian, bicyclist, and vehicular access must be provided and maintained to fire hydrants, homes, commercial and industrial establishments, parking lots, and all similar facilities and establishments. Access must be navigable, continuous, and unobstructed unless otherwise approved by the agency.

****END OF SECTION****

**SECTION 02072
TIE-IN SEQUENCING**

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. This section describes the procedures for tie-ins to the existing water main line and at the designated tie-ins to the existing water services.

PART 2 – MATERIALS (NOT USED)

PART 3 – EXECUTION

3.01 TIE-IN REQUIREMENTS

- A. Existing Water System: In order to prevent unnecessary interruption of the water main line, a controlled scheduling and sequence of the Contractor's work is necessary. The Contractor shall work in cooperation with City Operations and Maintenance personnel to maintain continuous operation of the system. The Contractor is required to submit a schedule and tie-in plan for City approval within ten (10) days prior to starting any of the tie-in work. The plan shall include an emergency response measures.
- B. Multiple pressure tests and disinfection operations are expected to be required as segments of new main are ready to be placed into service. The contractor may segment pressure testing, and disinfection of the new main into phases treating each as an independent main and tie-in.
- C. The Contractor shall not operate any valve or other water or water appurtenances without permission of the City.
- C. Connections to Existing Facilities:
1. The existing water main must remain in service until the new water main line is tested, disinfected, and tied in. The new lines must be completely tested and disinfected before tying into the existing lines.
 2. The cost of temporary facilities and other items necessary for successful completion of the project shall be included in the bid.
 3. The Contractor shall be fully prepared to complete the connection in the time allotted and shall not stop work until the facilities are restored to service or until otherwise directed so by the City. All possible preparatory work shall be completed to the satisfaction of the City prior to connection to the existing system. The City reserves the right to cancel or delay the tie-ins due to weather, equipment or man-power concerns.
- D. Exposing Existing Facilities: When connections are to be made to any existing pipe or other appurtenances, a minimum of two days before the tie-in the Contractor shall excavate and expose the existing facility before the connection is made to determine the actual size, elevation, or position of the facility.
- E. Tie-in Sequencing
1. After successful testing and disinfection of the new water main line (or water

main segment), the new water main line shall be connected to the existing waterline at the designated locations.

2. Existing lines will need to be capped and remain water tight until existing system is abandoned.
3. Contractor is required to employ adequate resources to ensure that no customer shall be out of service for more than 4-hours at a time, for more than 2 consecutive days with an outage and no more than 2 outages total, regardless of duration of each outage.
4. Contractor shall forfeit \$200/day/customer for each day that any individual customer exceeds the above shut-down limitations.
5. The Contractor is responsible for distributing door hangers to all affected addresses 48-hours prior to planned shutdown.
6. The Contractor is responsible for dewatering and disposal of any flow remaining in the service.
7. Only after full restoration of all service (or main segment) will final abandonment of the existing system (or existing segment) be performed. Contractor shall provide an abandonment plan in advance of final abandonment of existing water main segment.
8. The final connection to EID service may need to be performed as night work after business hours. Contractor shall coordinate with the Engineer and EID representative.

**** END OF SECTION ****

SECTION 02075
PROTECTION, TESTING, AND RESTORATION OF EXISTING FACILITIES

PART 1 – GENERAL

1.01 REQUIREMENTS

- A. This section is intended to include requirements associated with protection, testing, and restoration of existing facilities such as underground utilities, sprinkler systems, utility poles, surface improvements, and survey markers.

1.02 RELATED REQUIREMENTS

- A. Section 02491 – Landscaping Repair

1.03 NOTIFICATION OF UTILITIES

- A. Utility Owners, including El Dorado County and El Dorado Irrigation District, are to be contacted by the Contractor prior to any excavation activities requesting locations on underground utilities and services on a street by street basis. Should any apparent interference's exist, the: Engineer shall be immediately notified.
- B. Contractor shall utilize the services of Underground Service Alert (USA) and shall obtain a USA ticket and keep the ticket current during excavating. USA may be contacted at 1-800-642-2444.
- C. In the event that a conflicting utility is damaged, the utility owner shall be notified and given the opportunity to specify alternative repair materials or methods.

1.04 INTERRUPTION TO UTILITIES

- A. Any underground facilities located by utility owners, the City, or indicated in Contract Documents shall be treated as directed in Section 00700 to the Construction Contract.
- B. Any underground facilities not located by utility owners and not indicated in Contract Documents shall be treated according to Section 00700 to the Construction Contract
- C. Exact locations and depths of all underground utilities shall be verified, by uncovering, prior to commencing any WORK activities, as required in Section 00700. When such exploratory excavations show the underground utility locations as indicated in Contract Documents to be in error, the Contractor shall immediately notify the Engineer in writing.
- D. Where utilities are to be relocated, Contractor shall make proper application to the owners of the conflicting utilities and notify Engineer of specified time and conditions of necessitated WORK.
- E. Contractor shall, prior to work on private property, coordinate with the property owner to test existing sprinkler systems. The test shall require the Contractor to visually inspect the operating sprinkler system and to note any deficiencies. The Contractor shall provide to the City and the landowner a list of deficiencies

- F. All restorations made to utilities shall be inspected and approved by an authorized representative of the utility before being concealed by backfill or other WORK.
- G. No additional compensation for any breaks or other delays associated with working around existing utility lines (gas, water, sewer, irrigation, etc) will be made. The Contractor assumes the responsibility to retain and protect existing utility lines within or without the specified pay limits.
- H. Contractor is responsible and assumes all liability to retain and protect all utility poles within or beyond the specified pay limit.
- I. Contractor accepts responsibility for repair of utilities damaged during construction whether shown on the plans or not.

1.05 PROTECTION OF SURVEY AND STREET MARKERS

- A. Survey markers or other existing street markers shall not be destroyed, removed, or otherwise disturbed without proper authorization. No pavement breaking or excavation shall be started until all surveyor or other permanent marker points that will be disturbed by the construction operations have been properly referenced for easy and accurate restoration by the Contractor.
- B. All survey markers or points disturbed, will be accurately restored by the Contractor after all WORK is complete. The Contractor is responsible to replace survey markers per City of Placerville standards and obtain approval from the City prior to final closeout of the project.

1.06 PROTECTION OF TREES

- A. Any construction work within the drip line of any tree shall conform to the City of Placerville Standard Specifications and the following: No tree shall be: removed without the expressed written permission of the property owner. Roots over 2 inches in diameter shall be protected and if accidentally damaged, shall be treated with sealer material or as approved by the City. Hand excavation may be required to avoid damage to roots 2 inches in diameter and larger. Cutting or breaking roots 2 inches in diameter or larger may require trimming of the tree to the satisfaction of the property owner or El Dorado County requirements.

PART 2 – PRODUCTS

2.01 REPLACEMENT IN KIND

- A. Unless indicated otherwise, or specifically authorized by a utility owner, reconstruct utilities with new material of the same size, type, and quality as that removed.

PART 3 – EXECUTION

3.01 GENERAL

- A. Replace per the City of Placerville standards all improvements such as curbs and gutters, barricades, traffic islands, signalization, fences, signs, etc. that are cut, removed, damaged, or otherwise disturbed by construction.
- B. Where utilities are parallel to or cross the construction but do not conflict with the permanent work to be constructed, follow the procedures given below and as

indicated in the drawings. Notify the utility owner a minimum of 48 hours in advance of the crossing construction and coordinate the construction schedule with the utility owner's requirements.

- C. Determine the true location and depth of utilities and service connections that may be affected by or affect the work. Determine the type, material, and condition of these utilities. In order to provide sufficient lead time to resolve unforeseen conflicts, order materials and take appropriate measures to ensure that there is no delay in work.

3.02 PROCEDURES

- A. Protect in place: Protect utilities in place, unless abandoned, and maintain the utility in-service, unless otherwise specified.
- B. Cut and Plug Ends: Cut abandoned utility lines and plug the ends. Install a 3-foot concrete plug in waterlines 4" or greater in diameter. Legally dispose of cut pipe and other removed items.
- C. Tees or outlets cut and capped on existing waterlines remaining in service will be subjected to the same leak standards as new pipe. Contractor shall account for thrust and pressure in the existing line when cutting and capping outlets.
- D. Remove and Reconstruct: Where so indicated in the drawings, or as required by the City's representative, remove the utility and, after passage, reconstruct it with new materials. Provide temporary services for the disconnected utility.

3.03 COMPACTION

- A. Utilities Protected in Place: Contractor shall backfill and compact under and around the utility.
- B. Sewer Crossing Procedures – When crossing a sewer service, lateral or main the contractor shall protect the existing facility in place. Any damaged sewer service, lateral or main shall be replaced per City standards at the Contractor's expense.

3.04 LAWN REPLACEMENT

- A. Any lawns damaged by construction shall be replaced with nursery grown sod and repaired at no cost to the City per Section 02491. Every attempt shall be made to satisfy the property owner that the repair has been made to restore private property to pre-construction conditions. Seeding may be allowed on a case by case basis to achieve better match with existing grass, if adequate soil preparation is performed and watering arrangements are made with the owner.

3.05 LANDSCAPING REPLACEMENT

- A. All landscaping, including plants, flowers, and/or other vegetation damaged by construction shall be replaced or repaired at no cost to the City per Section 02491. Every attempt shall be made to satisfy the property owner that the repair has been made to restore private property to pre-construction conditions.

3.06 YARD STRUCTURES

- A. Any structures including: fences, sheds, decks, walkways, concrete, asphalt, etc. Damaged by construction shall be replaced or repaired at no cost to the City. Every attempt shall be made to satisfy the property owner that the repair has been made to restore private property to pre-construction conditions.

3.07 PAVEMENT AND STRIPING

- A. All pavement and striping disturbed during the project shall be replaced in kind. Pavement and striping within commercial areas shall be approved by the property owner. Approvals shall be provided to the City in the form of a letter signed by the owner.

3.08 PRIVATE UTILITIES

- A. All private utilities such as irrigation systems, swimming pool piping, yard lighting systems, etc., shall be replaced or repaired at no cost to the City. Every attempt shall be made to satisfy the property owner that the repair has been made to restore private property to preconstruction conditions.

3.09 DRIVEWAYS

- A. Driveways shall be replaced in kind (but no less than 4" of concrete over 4" of gravel) by removing and replacing the entire damaged portion between joints or scores, except as follows:
 - 1. If there are no joints or scores in the damaged driveway, the Contractor may saw cut scores into the driveway in a symmetrically pleasing manner that is approved by the City and the property owner, to create concrete panels that are no larger than 10' x 10', and replace the newly created damaged portion;
 - 2. In the event that existing driveway panels are greater than 10' x 10', the Contractor may saw cut the driveway in a symmetrically pleasing manner that is approved by the City and the property owner, to create panels smaller than 10' x 10', and remove and replace only the damaged portion
- B. It is the intent of this specification that the Contractor will not be required to replace more than 10' x 10' of any single driveway but that if the Contractor is required to saw cut new panels into a driveway, the new panels will be required to be as close to 10' x 10' as possible.
- C. Compaction of sub-grade shall be per City of Placerville standards.
- D. Driveways may be temporarily repaired with gravel, such that property owner can still use the driveway for up to ten working days. All final driveway repairs shall be made within ten working days of damage occurring.

****END OF SECTION****

SECTION 02100 SITE PREPARATION

PART 1 – GENERAL

1.01 SCOPE

- A. This work shall consist of removing any objectionable material from within the construction area and such other areas as may be specified. Removal of existing facilities, clearing, and grubbing, shall be performed in advance of trenching operations and in accordance with the requirements specified in these specifications. Grubbing also required to clear the staging area.

PART 2 – MATERIALS

2.01 SCOPE

- A. The Contractor shall provide all materials and equipment to accomplish the work described.

PART 3 – EXECUTION

3.01 PRESERVATION OF PROPERTY

- A. Existing improvements and facilities, adjacent property, utility and facilities, and trees and plants that are not to be removed, shall be protected from injury or damage resulting from the Contractor's operations. Only trees and plants that are designated or marked for removal by the Engineer the District shall be removed.

3.02 REMOVAL OF EXISTING FACILITIES

- A. Removal of existing facilities shall consist of removing the facilities, which interfere with construction within the area to be cleared and grubbed. Removed facilities shall be disposed of, salvaged, relocated, reinstalled, or reconstructed as shown on the plans or as specified.
- B. Concrete removal shall be performed with minimum damage to any portion that is to remain in place. All damage to the existing concrete, which is to remain in place, shall be repaired to a condition equal to that existing prior to the beginning of removal operations at the Contractor's expense.
- C. All depressions excavated below the original ground surface shall be backfilled and compacted to a relative compaction equivalent to the original ground except for areas, which are to be subsequently excavated to a depth greater than the depressions.

3.03 CLEARING

- A. Clearing shall consist of the removal from the area above the natural ground surface of all vegetative growth, such as trees designated for removal, downed trees, logs, upturned stumps, roots of downed trees, brush, grass, weeds, and all other

objectionable material, including concrete or masonry within the area required for the construction and within the easements obtained by the District.

3.04 GRUBBING

- A. Grubbing shall consist of removal from the area below the natural ground surface and within the trench limits of all stumps, buried logs, and other objectionable material from within the limits of clearing.
- B. All depressions excavated below the original ground surface shall be backfilled and compacted to a relative compaction equivalent to the original ground except for areas which are to be subsequently excavated to a depth greater than the depression.

3.05 DISPOSAL OF MATERIALS

- A. Materials shall be removed from the site of the work unless otherwise specified. It shall be the Contractor's responsibility to locate suitable disposal sites unless a disposal site is specified.

***** END OF SECTION *****

SECTION 02115 EXISTING FACILITIES

PART 1 – GENERAL

1.01 SCOPE

- A. This work shall consist of identifying, protecting, and relocating existing facilities within the area of work. All work shall be performed to comply with the affected agency utility specifications.

PART 2 – MATERIALS

2.01 SCOPE

- A. The Contractor shall provide all materials and equipment to accomplish the work described. Materials shall comply with the governing agency specifications.

PART 3 – EXECUTION

3.01 PROTECTION OF FACILITIES

- A. The Contractor shall take all necessary measures to avoid injury to existing surface and underground utility facilities in and near the site of the work. No error or omission on the drawings shall be construed to relieve the Contractor from his responsibility to protect all underground pipes, conduits, cables or other structures. The Contractor shall indemnify the City and hold it harmless from any and all claims, demands, or liability made or asserted by any person or entity on account of, or in connection with any damage to such surface or underground facilities caused by the Contractor or any of his agents or subcontractors.

3.02 EXISTING UTILITIES

- A. The drawings for the work show the underground utilities on the site insofar as they are known to the Agency. The drawings may not show facilities apparent from visual inspection of the site or service laterals or appurtenances, the existence of which can be inferred from the presence of other visible facilities such as buildings, meters, junction boxes, etc., on or adjacent to the construction site.

3.03 RELOCATION OF EXISTING UTILITIES

- A. The Contractor shall make all arrangements for, and pay all costs connected with, any necessary relocation of existing surface and underground utility facilities (including without limitation, services, conduits, pipes, and mains) affecting the project or the work to be performed under these specifications.

3.04 UNIDENTIFIED EXISTING UTILITIES

- A. If, in the performance of the work, an existing facility is encountered which is not shown on the drawings and is not apparent or inferable from visual inspection of the site, the Inspector shall be notified immediately. The City will determine whether the drawings or specifications shall be modified, or whether existing utility shall be relocated or whether the Contractor shall work around the existing utility. If appropriate, the determination of the City shall be incorporated in a Change Order for extra work pursuant to the General Conditions.

**** END OF SECTION ****

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SECTION 02221
TRENCH EXCAVATION, BACKFILL AND COMPACTION

PART 1 – GENERAL

1.01 SCOPE

- A. This section governs the work for trench excavation, backfill and compaction for underground pipeline work.

1.02 SUBMITTALS

- A. Upon request, the following items shall be submitted and approved by the City.
 - 1. Test results showing gradation, durability and sand equivalent of pipe zone material.
 - 2. Permit and notification form for excavations 5 feet or more in depth as required by Cal-OSHA, including any trench excavation or shoring plans.

1.03 COMPACTION TESTING

- A. Compaction testing frequency and location shall be approved by the City.

1.04 POTHOLING

- A. The Contractor shall pothole all utility crossings with the proposed water main alignment and laterals prior to the installation of any water lines or laterals. Pothole all utility crossings a minimum of one week in advance of any work occurring and keep the project within the required time frames specified in Section 00800 and document depth and location versus that shown on the plans. Pothole data including station & offset, cover, direction, owner, facility type, material, and size shall be organized into a spreadsheet and submitted to the Engineer. All potholing shall be done in advance of the work and purchase of final fittings. Costs associated with any utility conflicts resulting from inadequate potholing effort shall be the responsibility of the contractor.
- B. Contractor shall, prior to any pipeline installation, mark with white paint the limits of pavement removal for the proposed pipeline alignment and mark the depth of all utilities crossing the proposed alignment.

PART 2 – MATERIALS

2.01 TRENCH EXCAVATION

- A. Excavation is unclassified. No geotechnical report is provided as part of this project. The Contractor shall perform a thorough investigation of the site. The Contractor shall complete all excavations regardless of the type of materials encountered. The Contractor shall make his own estimate of the kind and extent of the various materials which will be encountered in the excavation. Excavation of hard rock, if encountered, will be paid by force account of a time and materials basis. See Section 02221-3.04.

2.02 PIPE ZONE

A. Material for the pipe zone shall conform to one of the following:

1. Class 2 Aggregate Base – Shall conform with the specifications of Section 26 – Aggregate Bases – of the State Specifications.

2.03 BACKFILL

A. Outside Asphalt Road Sections

1. Material for backfill from 12 inches above the top of the pipe to subgrade, shall be free from organic matter, debris, and rocks larger than 6 inches in diameter or length. The City shall be the sole judge of conformance of backfill material to this specification.
2. Backfill material shall generally conform to the following gradation:

Sieve Size	Percent Passing
6"	100
3"	50
#4	35 - 100
#30	20 – 100

B. Within Asphalt Road Sections

1. Trench shall be backfilled with Class II AB or controlled low strength material (CLSM) as approved by the Engineer.

PART 3 – EXECUTION

3.01 EXCAVATION

- A. Excavation for pipelines, fittings, and appurtenances shall be open trench to the depth and in the direction necessary for the proper installation of the same as shown on the contract drawings or as otherwise approved by the Engineer. Excavation shall only proceed when the necessary materials have been delivered to the site.
- B. The Contractor shall bear all costs of disposing of roots and all other waste materials from the excavation. Material shall be disposed of in such a manner as to meet all requirements of the state, county, and local regulations regarding health, safety, and public welfare. Non-flammable material and

flammable material, when burning is not permitted, shall be disposed of off the construction site in an approved location at the Contractor's expense.

- C. The Contractor shall remove obstructions within the trench area or adjacent thereto, such as abandoned concrete structures, logs, and debris of all types, without additional compensation. The Engineer may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment can be made without adversely affecting the intended function of the facility.

1. Existing Pavement Removal - Pavement to be removed shall be removed and replaced in the manner prescribed by the Agency issuing the encroachment permit.

Existing pavement, curbs, gutters, sidewalks and driveways to be removed in connection with construction shall be neatly saw cut prior to removal. Saw cuts shall have a minimum depth of one inch in concrete sidewalk. Road section depths and materials (e.g. asphalt and concrete depths) may vary. Contractor is responsible to determine saw cutting requirements.

Concrete sidewalks or driveways shall be removed so that a minimum 30-inch square is replaced. If the saw cut in a sidewalk or driveway would fall within 30 inches of a construction joint, expansion joint, or edge, the concrete shall be removed and replaced to the joint or edge. If the saw cut would fall within 12 inches of a score mark, the concrete shall be removed and replaced to the score mark. Concrete shall be removed by jackhammer.

2. Grading and Stockpiling - The Contractor shall control grading in a manner to prevent water running into excavations. Obstructions of surface drainage shall be avoided and means shall be provided whereby storm and wastewater can be uninterrupted in existing gutters, other surface drains or temporary drains. Material for backfill or for protection of excavation in public roads from surface drainage shall be neatly placed and kept shaped so as to cause the least possible interference with public travel. Free access must be provided to all fire hydrants, water valves, meters and private drives.

3. Line and Grade - The Contractor shall excavate the trench to the lines and grades shown on the plans. Any deviations shall first be approved by the Engineer.

The trench shall be excavated to a minimum depth of 6 inches below the bottom of the pipe. The sides of the trench shall be excavated and maintained as nearly vertical as is practical.

4. Trench Support - The trench shall be adequately supported and the safety of workers provided for as required by the standard of the appropriate regulatory agency.

All shoring for open excavations shall conform to the State of California, Department of Industrial Relations, and Division of Industrial Safety "Construction Safety Orders."

The Contractor shall be responsible for adequately shored and braced excavations so that the earth will not slide, move or settle, and so that all existing improvements of any kind will be fully protected from damage.

No shoring once installed, shall be removed until the trench has been approved for backfill operations. Removal of shoring shall only be accomplished during backfill operations and in such a manner as to prevent any movement of the ground or damage to the pipe or other structures.

The Contractor shall obtain all permits for any excavations over five feet in depth into which a person is required to descend or any excavation less than five feet in depth in soils where hazardous ground movement may be expected and into which a person is required to descend.

Excavated material shall not be placed closer than two feet from the top edge of the trench. Heavy equipment should not be used or placed near the sides of the trench unless the trench is adequately braced.

5. Use of Explosives – Blasting is strictly prohibited.
6. Preservation of Trees - Excavation within the dripline of any tree shall conform to the following and to encroachment permits. Trees shall not be removed outside of fill or excavated areas, except as authorized by the City.

Tree roots larger than 2 inches in diameter, shall not be cut and shall be kept moist during exposure. For damaged or severed root systems, trees shall be trimmed to compensate for the decreased root system. Trimming shall be done to the satisfaction of the Inspector. All roots shall be neatly cut with saw or sharp cutter.

7. Dewatering - The Contractor shall provide and maintain, at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. Said methods may include well points, sump pumps, suitable rock or gravel placed below the required bedding for drainage and pumping purposes, temporary pipelines and other means, all subject to the approval of the Engineer.

Dewatering for the structures and pipelines shall commence when groundwater is first encountered and shall continue until the backfill at the pipe zone has been completed.

The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction without prior consent of the Engineer. Water shall be disposed in such a manner as not to be a menace to public health.

The Contractor shall be responsible to obtain all required Local and State Permits and comply with all applicable regulatory requirements. The Contractor shall provide the City with a dewatering plan clearly showing compliance prior to any dewatering activities.

8. Correction of Faulty Grades – Any over-excavation carried below the grade as specified or shown, shall be rectified by backfilling with approved sand and/or graded gravel, and shall be compacted to provide a firm and unyielding subgrade and/or foundation, as directed by the Engineer.
9. Structure Protection – Temporary support, adequate protection and maintenance of all underground and surface structures, drains, sewers and

other obstructions encountered in the progress of the work shall be furnished by the Contractor at his expense and subject to the approval of the Engineer. Any structure that has been disturbed shall be restored upon completion of the work.

10. Protection of Property and Surface Structures - Trees, shrubbery, fences, and poles and all other property and surface structures shall be protected unless their removal is shown on the drawings or authorized by the Engineer.
11. Trench Width and Grade - The width of the trench within the pipe zone shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed the amount shown in the standard details. In general, the following shall be adhered to:

Nominal Pipe Diameter	Trench Width Minimum	Maximum
2"-12"	O.D. + 12"	O.D. + 18"
14"-20"	O.D. + 24"	O.D. + 36"

Trench widths in excess of those specified must have prior written approval.

12. Maximum Length of Open Trench - Unless otherwise specified or directed by the City or County, the maximum length of open trench shall be 200 feet, or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is greater. The distance is the collective length of any location, including open excavation, pipe laying and appurtenant construction and backfill which has not been temporarily resurfaced. Failure by the Contractor to comply with the limitations specified herein may result in an order to halt progress of the work until compliance has been achieved. The Contractor shall provide proper barricades for excavated areas.

3.02 TRENCH FOUNDATION

- A. The trench bottom shall be graded to provide a smooth, firm and stable foundation at every point throughout the length of the pipe. Should large gravel and cobbles be encountered at the trench bottom or pipe subgrade, they shall be removed from beneath the pipe and replaced with class 2 aggregate base which shall be compacted to provide uniform support and a firm foundation.
- B. Foundations in Poor Soil - If excessively wet, soft, spongy, unstable or similarly unsuitable material is encountered at the surface upon which the bedding material is to be placed, the unsuitable material shall be removed to a depth as determined in the field by the Engineer. The Contractor's attention is called to Section 3.1G, regarding his responsibilities in maintaining adequate dewatering procedures to ensure that an otherwise stable foundation will not be rendered unfit due to accumulation of water.

3.03 BACKFILL AND COMPACTION

- A. Backfill shall be completed within the shortest possible time so that the construction area or street can be opened to traffic. If for any reason construction of the pipeline or appurtenances thereto is delayed, the City may

require that the trench be backfilled and such areas or streets opened to traffic.

- B. Pipe Zone - After completion of the trench excavation and proper preparation of the foundation, 6 inches of bedding material shall be placed on the trench bottom for support under the pipe. Bell holes shall be dug to provide adequate clearance between the pipe bell and the bedding material. All pipe shall be installed in such a manner as to insure full support of the pipe barrel over its entire length. After the pipe is adjusted for line and grade and the joint is made, the remainder of the pipe bedding shall be placed to the limits as shown on the Drawings. All bedding material shall be compacted 90 percent as measured by Test Method California 231, prior to placement of subsequent backfill.
- C. When bedding material is class 2 aggregate base or imported sand, the pipe bedding backfill shall be brought to optimum moisture content and shall be placed by hand in layers not exceeding 3 inches in thickness to the centerline (springline) of the pipe and each layer shall be solidly tamped with the proper tools so as not to injure, damage, or disturb the pipe. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe.
- D. Each lift shall be "walked in" and supplemented by slicing with a shovel to ensure that all voids around the pipe have been completely filled. Mechanical compaction such as "pogo sticks" or "wackers", as approved, shall be used for compaction of pipe zone.
- E. Initial Backfill - The remaining portion of the trench shall be backfilled, compacted and/or consolidated by approved methods to obtain a 90% compaction as measured by Test Method 231F. Backfill shall be Class 2 AB unless otherwise approved by the City Engineer. Bituminous pavement, concrete, rock, or other lumpy material shall not be used in the backfill unless these materials are scattered and do not exceed 6 inches in any dimension and are not placed within 1½ feet of the surface. Material of perishable, organic matter, spongy or otherwise improper nature, shall not be used.
- F. When backfill is placed mechanically, the backfill material shall be pushed onto the slope of the backfill previously placed and allowed to slide down into the trench. The Contractor shall not push backfill into the trench in such a way as to permit free fall of the material until at least 18 inches of cover is provided over the top of the pipe. Under no circumstances shall sharp, heavy pieces of materials be allowed to be dropped directly onto the pipe or the tamped material around the pipe. Backfill shall be placed in layers not exceeding 8 inches and compacted by an approved method.
- G. Heavy duty compacting equipment having an overall weight in excess of 125 pounds shall not be used until backfill has been completed to a depth of 2 feet over the top of the pipe.

- H. If hydro-hammer is used for compaction of overlying materials, at least 4 feet of backfill must be placed over the top of pipe prior to its use. This is required to insure that the pipe is not damaged.
- I. Final Backfill - Final backfill placed in trenches below roadways or below shoulders of roadways, shall be compacted to a density of not less than 95% or as directed by the encroachment permit. Backfill outside of roadways shall be compacted to 90%.
- J. Backfill shall be placed in layers not exceeding 8 inches, compacted and brought up to the subgrade of the roadway.

3.04 HARD ROCK EXCAVATION

- A. Excavation of unrippable rock requiring a larger excavator and/or hydraulic hammering will be paid for as an additional cost above and beyond the cost for excavation and trenching for ordinary excavation. The City Engineer will determine when rock excavation for unrippable rock is required per the definition below.
- B. Definition of Rock: Rock encountered during the course of excavation which is sufficiently hard that it cannot be removed using a Caterpillar 320 class excavator or equivalent using conventional methods shall be deemed inexcavatable. Rock deemed inexcavatable shall be removed by substantial means such as reciprocating hydraulic hammers and shall conform to this specification.

3.05 EXCESS EXCAVATED MATERIAL

- A. The Contractor shall make the necessary arrangements for, and shall remove and dispose of all excess excavated material. It is the intent of these specifications that all surplus material not required for backfill or fill shall be disposed of by the Contractor outside the limits of the public right-of-way and/or easements at no liability to the City.
- B. No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the Contractor. Before the City will accept the work as being completed, the Contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposal of excess excavated material absolving the City from any liability connected therewith.
- C. Full compensation for haul-off and disposal of native trench material is included in the prices paid per linear foot of the respective sizes, grades, and types of pipes listed in the contract, and no additional compensation will be paid.

3.06 RESTORATION OF DAMAGED SURFACES AND PROPERTY

- A. If any pavement, trees, shrubbery, fences, poles or other property and surface structures have been damaged, removed, or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the

contract documents, state laws, municipal ordinances, or the specific direction of the City, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor.

3.07 FINAL CLEAN-UP

- A. After backfill has been completed, the right-of-way shall be dressed smooth and left in a neat and presentable condition to the satisfaction of the City and County.

***** END OF SECTION *****

**SECTION 02491
LANDSCAPE REPAIRS**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The Contractor shall furnish all labor, equipment, and materials necessary to perform the following work as indicated on the drawings and specified herein:
 - 1. Finish Grading
 - 2. Lawn and Grass Restoration
 - 3. Soil Preparation
 - 4. Clean Up
 - 5. Maintenance
 - 6. Guarantee

1.02 EXISTING CONDITIONS

- A. Before submitting bid, the Contractor shall visit the site and become familiar with all conditions relative to landscaping, elevations, soils, area of work, clearances, etc.; no extra payment will be allowed for work occasioned by improper appraisal of existing conditions. Contractor shall document existing conditions with photographs and video per City Standards.
- B. Existing landscaping shall be preserved wherever possible.

1.03 WORK ON PRIVATE PROPERTY

- A. The Contractor is made aware that portions of the project require work on private property to install new water meters and fire hydrants. The Contractor is responsible for coordinating with individual property owners and ensuring that all property is restored to pre-construction conditions. Contractor shall provide evidence of private property owner final approval of restored conditions prior to final completion. No final payment or release of retention will be allowed until approvals are submitted.

1.04 LIKE LANDSCAPING

- A. Contractor shall replace all damaged landscaping with plants similar in variety, size, and shape to the existing landscaping. In the event that like landscaping is not commercially available, the Contractor shall coordinate with the property owner for a replacement. In no case will the Contractor be required to replace landscaping to a higher value than the existing without additional considerations from the City.

1.05 HARDSCAPING

- A. Concrete, asphalt, and other hardscaping shall be sawcut as appropriate and replaced to the limits provided in the approved property owner agreement.

Alternative methods of repair shall be approved by the property owner and the City.

- B. Replacement of hardscaped surfaces shall match existing as much as possible and may include exposed aggregate, stamped concrete, colored concrete, brick, stone, etc.
- C. Contractor's personnel physically performing this replacement work shall have a minimum of ten (10) years experience in performing related hardscape work and shall demonstrate a high level of competence.

1.06 RELATED WORK AND REFERENCES

- A. Section 02221- Trenching, Backfilling and Compacting
- B. ASPA (American Sod Producers Association) -Guideline Specification for Sodding

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sod to the site on palettes within 24 hours of stripping.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2 – MATERIALS

2.01 SOIL CONDITIONER

- A. Shall be treated bark, 1/4" size, Vita-Bark Nursery Mix, or equal.

2.02 GROWING MEDIA

- A. Topsoil: Natural, fertile, agricultural soil capable of sustaining vigorous plant growth, not in frozen or muddy condition, containing not less than six (6) percent organic matter, and corrected to pH value of 5.9 to 7.0. Free from subsoil, slag, clay, stones, lumps, live plants, roots, sticks, crabgrass, coughgrass, noxious weeds, and foreign matter. Not exceeding twelve (12) inches in depth.
- B. Fertilizer: Use commercial fertilizer formulation required by soil analysis. Deliver fertilizer mixed as specified in standard size bags showing weight, analysis, name of manufacturer. Store in a weatherproof storage location in such a manner that it will be kept dry and its effectiveness will not be impaired.

2.03 HYDRO MULCH AND SEEDING

- A. Provide hydro-mulch and seeding (if approved in lieu of sod) for any lawn or landscape area disturbed.

PART 3 – EXECUTION

3.01 PRE-CONSTRUCTION DOCUMENTATION

- A. Prior to construction, the Contractor will document the conditions of all surface features of the affected areas.

3.02 FINISH GRADING

- A. Drainage: make entire area within contract lines smooth and even and insure adequate drainage of all areas. There shall be no depressed areas where water is trapped creating wet areas. Should this be discovered by the City before or after completion of the landscape, the Contractor shall correct the problem at no expense to the City.
- B. Finish Grades: Insure that finish grades shall be 1/2" below surface of paved areas.
- C. Scars: Eliminate any erosion or construction scars.

3.03 SOIL PREPARATION

- A. All areas to be seeded or shrub planting beds shall be cleared and weeded. Fertilizer shall be applied in accordance with the recommendations of the nursery supplying the plants.

3.04 PLANTING

- A. Trees: Plant and stake trees in accordance with supplying nursery recommendations.
- B. Shrubs: Plant and support shrubs in accordance with supplying nursery recommendations.

3.05 WEED CONTROL

- A. Apply pre-emergent weed control to all shrub planting beds after completion of all planting. Follow manufacturer's direction. Do not allow any weed control in the seeded areas. After applying the pre-emergent weed control, do not over-water any areas to prevent the washing away of pre-emergent weed control.

3.06 MAINTENANCE

- A. Until the City Acceptance: The 2-month maintenance period will commence upon completion of the repairs and/or tree and shrub planting as verified by the City as a result of an on-site visit. The Contractor shall request this on-site visit, in writing, five days in advance. Completion of the maintenance period shall be verified by another on-site visit. The Contractor shall also request this on-site visit, in writing, five days in advance. If landscaping or maintenance is unacceptable, the maintenance period shall continue until final acceptance of the job by the City.
- B. Replacements: All dead plant materials and all plants not in a vigorous growing condition at the end of the maintenance period shall be replaced as weather conditions permit. Plants used for replacement shall be of the same variety and size (where possible) as those originally planted and shall be planted as specified.
- C. Maintenance: Maintenance shall include all watering, reseeding, spraying, pruning, and weeding necessary to keep the planting areas neat and attractive throughout the maintenance period.
- D. The Contractor is not expected to engage in long term maintenance of the new sod or seeded areas. However, he shall maintain the sod or seed until the completion

of the two month maintenance period referenced in Section 3.06. While the Contractor is maintaining the sod/seed, the following conditions shall be met.

1. Water as needed to promote growth and health of the sod. Water grass sufficient to moisten soil 3-5 inches deep.
2. Replant damaged areas. Roll when necessary to remove minor depressions or irregularities.
3. Control growth of weeds. When using herbicides, apply in accordance with manufacturer's recommendations. Remedy damage resulting from negligent or improper use of herbicides. Only use herbicides with the permission of the property owner. If the property owner does not allow the use of herbicides, Contractor will not be liable for weed control.

E. SPRINKLER SYSTEMS

1. With cooperation of the owner, contractor shall operate existing sprinkler system prior to any construction that may affect the system.
2. The Contractor shall repair or replace damaged private private sprinkler system to a condition that meets or exceeds existing conditions.
3. With cooperation of the owner, ensure sprinkler system settings are adequate to ensure adequate watering of the newly placed seed or sod.
4. Contractor shall submit a report of findings to the inspector.

3.07 POST CONSTRUCTION DOCUMENTATION

- A. Produce Post-Construction photographs and video per City Standards.

****END OF SECTION****

**SECTION 02575
PAVEMENT RESTORATION**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Work in this section includes reconstruction of all curbs, gutters, sidewalks, mow strips, driveways, road shoulders, pavement and similar items damaged as a result of the work. Reconstruction shall match the original materials and dimensions subject to the minimum requirements of the Contract Documents. All work shall match the appearance of the existing improvements. Work covered in this section shall be completed in accordance with the City of Placerville and El Dorado County Standard Specifications.
- B. Related Documents: The General and Supplementary Conditions and the applicable sections of Division 1, form a part of this section.

1.02 REFERENCE DOCUMENTS

- A. Reference Specifications: Whenever the words "Standard Specifications" are referred to in the Specifications, the reference is to the State of California, Department of Transportation (CALTRANS), Standard Specifications (2015). Standard Specifications paragraphs concerning measurement and payment are excluded.

1.03 SUBMITTALS

- A. General: Submit the following items in accordance with Section 01330 SUBMITTALS.
- B. Certification: Certification from the material supplier that the materials supplied for this project meet the Specifications.

PART 2 – PRODUCTS

2.01 CONCRETE

- A. Concrete shall meet the requirements of Section 03301 CAST-IN-PLACE CONCRETE.

2.02 HOT MIX ASPHALT (HMA) PAVEMENT

- A. Hot Mix Asphalt Pavement is not considered minor hot mix asphalt and shall meet the requirements of Section 39 of the 2015 Standards and the City of Placerville Standard Specifications and approved Encroachment Permits.
 - 1. Asphalt binder used in HMA Type A must be PG 64-16.
 - 2. Aggregate used in HMA Type A must comply with the ½-inch HMA Types A and B gradation.

2.03 TRAFFIC STRIPES AND PAVEMENT MARKINGS

- A. Thermoplastic striping is not required for this Project. Temporary striping and pavement markings shall comply with Caltrans standards Section 12-6 – Temporary Pavement Delineation.

PART 3 – EXECUTION

3.01 PAVEMENT CUTTING

- A. After backfilling trenches or excavations and prior to paving, sawcut existing pavement parallel to the trench or excavation to a minimum depth equal to or greater than one-half the pavement thickness. Any pavement damaged outside these lines shall be re-cut and restored at the expense of the Contractor. Should voids develop under existing pavement during construction, those affected areas shall be sawcut in straight orthogonal lines and replaced after the voids have been filled.

3.02 TEMPORARY PAVEMENT

- A. Temporary resurfacing consisting of not less than 2 inches of hot mix asphalt concrete shall be placed and maintained wherever an excavation is made through an existing pavement. The temporary resurfacing shall be maintained to provide for the safety and convenience of the public. Temporary pavement shall be placed as soon as the condition of the trench backfill is considered by the City to be suitable to receive resurfacing. Temporary resurfacing shall be removed prior to permanent resurfacing. Temporary pavement shall be clearly marked "Temporary Pavement".

3.03 PERMANENT PAVEMENT

- A. Permanent hot mix asphalt (HMA) resurfacing and striping shall be placed in accordance with Section 39 of the 2015 Standards and the City of Placerville Standard Specifications and approved Encroachment Permits.

3.05 CONCRETE RESTORATION

- A. Restore all concrete items per City of Placerville Standards.
- B. Replace curb, gutter and sidewalk between the expansion joints at all locations where trenching across them.
- C. Sidewalk repair shall be per City of Placerville Standards.
- B. Restore all other concrete items to the same dimensions and thickness as the original items. Place concrete in accordance with the requirements of Section 03300 CONCRETE. Upper 6 inches of subgrade shall be compacted to a minimum 95 percent relative density prior to placement of concrete. Surface finish shall match existing surrounding surface.

****END OF SECTION****

SECTION 02615
DUCTILE IRON PIPE, FITTINGS AND COUPLINGS

PART 1 – GENERAL

1.01 SCOPE

- 1 This specification governs the furnishing and installation of ductile iron pipe material and main line fittings including laying, joining, bedding and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be accomplished in strict accordance with the drawings and other terms and conditions of the contract.
- 2 Fitting types covered under this section include bends, tees, crosses, reducers, couplings, caps, plugs, adapters and all other fittings necessary for a complete pipeline installation.
- 3 The Contractor shall also furnish all equipment, tools, labor and materials required to relocate sewers, conduits, ducts, pipes, or other structures as may be necessary to complete the installation as shown and specified.
- 4 All standard specifications, i.e., AWWA, ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.
- 5 The Contractor shall be responsible for all material furnished by him, and shall replace at his own expense, all material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishings of all material and labor required to replace defective material discovered prior to final acceptance of the work.
- 6 The Contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe and fittings shall be kept free from dirt and foreign matter at all times.
- 7 Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and bell sockets shall be free from gouges or other imperfections that might cause leakage.

1.02 STORAGE AND CARE

- A. The Contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe and fittings shall be covered or capped to be kept free from dirt and foreign matter at all times.
- B. Pipe shall be stored at the job site in unit packages provided by the manufacturer. Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease.

1.03 SUBMITTALS

- A. Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

1. Pipe and joint material
2. Fittings
3. Specialties
4. Thrust block mix design

PART 2 – MATERIALS

1.01 DUCTILE IRON PIPE (DI)

- A. Ductile iron pipe shall conform to the quality and strength requirements of AWWA C-151.
 1. Markings - Each standard or random length of pipe shall be clearly marked with the following:
 - a. The letters "DI" or "Ductile"
 - b. Nominal size and class
 - c. Year produced
 - d. Manufacturer's trade name and country where cast
 - e. Seal (mark) of testing agency
 2. Pressure Class - Where the class is not indicated on the plans, the pipe shall be Class 350.
 3. Laying Length - Standard laying lengths of 18- or 20-foot are acceptable.
 4. Joint Type - Unless otherwise shown or specified, pipe joints shall be rubber gasket push-on type joint conforming to AWWA C-111.
 - a. Flanged Joint - Where flanged joints are specified, pipe barrel shall be threaded and fitted with flanges in accordance to AWWA C-115 "Flanged Ductile Iron Pipe with Threaded Flanges."
 5. Physical Test Requirements - Hydrostatic, tension test, and impact test shall be conducted at the factory in accordance with ASTM A 746. All testing shall be performed by a recognized testing laboratory with such testing available for inspection by the City. If required, the manufacturer shall supply a letter of certification attesting to their pipe meeting these specifications.
 6. Lining and Coating - The exterior shall be epoxy enamel coated.
 7. Polyethylene Encasement - Pipe and fittings shall be wrapped in polyethylene. Polyethylene wrapping shall be in accordance to AWWA C-105, latest revision. Minimum thickness shall be 0.008 inch (8 mils).
 8. Locating Wire – Locating wire shall be single strand, 10-gauge copper wire, with solid thermoplastic insulation.
 9. Warning Tape - Two-inch-wide non-metallic tape marked "water main."

2.02 FITTINGS

- A. All cast and ductile iron fittings shall be manufactured in accordance with the following AWWA Standards: C-110, "Gray-Iron and Ductile-Iron Fittings, 3 inches through 48 inches for Water and Other Liquids", C-111, "Rubber-Gasket Joints for

Ductile-Iron and Gray-Iron Pressure Pipe and Fittings". The exterior shall be epoxy enamel coated.

- B. All fittings shall be rated equally to the class of pipe. End connections may be push-on, mechanical, or flanged joints.
- C. Ductile iron compact fittings, per AWWA C-153, are allowed.

1. Flanges, Bolts and Gaskets - Flanges shall be flat-faced and meet either the requirements of AWWA C-207 for steel hub flange fittings, or AWWA C-110 Section 10-18 for ductile iron fittings. The flanges shall be marked with the size, name or trademark of manufacturer and with the AWWA Class; i.e., "E", or pressure rating.

Bolts and nuts shall be cadmium plated, A307, Grade B of domestic origin. Cadmium plating shall conform to Federal Specification QQ-P-415-1956, Type 1, Class 1.

Gaskets shall be 1/8-inch thick and be of the full-face self-centered type. The following table shows the bolt pattern for ASME/ANSI 16.1 Class 125 cast iron flange. This pattern is rated at 275 psi for Class E steel pipe flanges and 250 psi for ductile iron pipe fittings.

Pipe Size	Diameter (Inches)	Bolt Hole	
		Bolt Diameter & Length (Inches)	Number of Bolts
6"	7/8	3/4 x 3 1/2	8
8"	7/8	3/4 x 3 1/2	8
10"	1	7/8 x 4	12
12"	1	7/8 x 4	12
14"	1 1/8	1 x 4 1/2	12
16"	1 1/8	1 x 4 1/2	16
18"	1 1/4	1 1/8 x 5	16
20"	1 1/4	1 1/8 x 5 1/2	20

The Contractor shall uniformly tighten the bolts and prevent bending or torsional strains. Proper anchorage shall be provided.

2. Mechanical Joint Fittings - The mechanical joints shall meet AWWA C111. That standard covers the joint as well as gaskets and bolts. T-bolts and nuts shall be manufactured of corrosion-resistant high-strength low-alloy Cor-Ten steel or equal. Number and length of bolts shall be as follows:

Pipe Size	Number of Bolts	Bolt Diameter & Length (Inches)
6"	6	$\frac{3}{4}$ x 3 $\frac{1}{2}$
8"	6	$\frac{3}{4}$ x 4
10"	8	$\frac{3}{4}$ x 4
12"	8	$\frac{3}{4}$ x 4
14"	10	$\frac{3}{4}$ x 4
16"	12	$\frac{3}{4}$ x 4 $\frac{1}{2}$
18"	12	$\frac{3}{4}$ x 4 $\frac{1}{2}$
20"	16	$\frac{3}{4}$ x 4 $\frac{1}{2}$

3. Restrained Joints - Restrained joint pipe and fittings shall be U.S. Pipe TR FLEX or approved equal.
4. Coatings and Linings - Cast iron fittings shall be bituminous coating and lined per AWWA C110.
Threaded holes and mating surfaces shall not be coated. Flange faces shall be coated with asphaltic varnish only. There shall be no coating of materials, or mortar on gasket grooves.
5. Mechanical Couplings - Couplings include transition couplings, flanged coupling adapters, high deflection couplings, and flexible and insulated couplings.
 - a. Coupling Sleeves and Flanges - Coupling sleeves and flanges may be of gray iron or carbon steel.
 - b. Bolts and Nuts for Flanges - Bolts and nuts for buried and submerged flanges, flanges in underground vaults and structures, and flanges located outdoors above ground shall be cadmium plated, A307, Grade B. Provide one washer for each nut. Each washer shall be of the same material as the nut.

2.03 TRANSITION COUPLING

- A. Scope: The following governs the furnishing and installation of transition couplings.
- B. Manufacturers: Transition couplings shall be Romac 501, Smith-Blair Omni 441, Rockwell 433, or Ford FC1.

2.04 FLEXIBLE COUPLINGS

- A. Scope: The following governs the furnishing and installation of flexible couplings.
- B. Manufacturers: Flexible couplings shall be APAC, Baker 200 series, JCM, Rockwell 400 series or Romac.

2.05 HIGH DEFLECTION COUPLINGS

- A. Scope: The following governs the furnishing and installation of high deflection couplings.
- B. Manufactures: High deflection couplings shall be XTRA FLEX restrained joint high deflection fitting, by U.S. Pipe or approved equal.

2.06 FLANGED COUPLING ADAPTORS

- A. Scope: The following governs the furnishing and installation of flange coupling adapters.
- B. Manufacturers: Flanged coupling adapters shall be Romac FC400 Series, APAC, Baker, JCM, or Rockwell equal. Pipe restraining systems shall be Romac 600 Series, APAC, Baker, JCM, or Rockwell equal.

2.07 THRUST BLOCK

- A. Thrust blocking is required at all fittings 11-1/4 degrees or larger in the pipe per these Plans and Specifications.
- B. Refer to Section 03300 – Concrete and Reinforcing Steel for concrete mix requirements and backfill requirements.

PART 3 – EXECUTION

3.01 HANDLING AND TRANSPORTATION

- A. Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.
Heavy canvas, or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.
- B. Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.
 - 1. Rubber Gasket Storage - All rubber gaskets shall be stored in a cool, well ventilated place and not exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

3.02 PIPE LAYING

- A. Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein.
 - 1. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.
Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress. Ground water shall not be allowed to enter the pipe.
 - 2. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects while suspended and before installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the City, who will prescribe corrective repairs or rejection.
 - 3. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the City, shall be provided and used by the Contractor for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece

by piece in such a manner as to prevent damage to the water main materials and protective coatings and linings.

Under no circumstances shall water main materials be dropped or dumped into the trench.

If damage occurs to any pipe, fittings, valves, hydrants or water main accessories in handling, the damage shall be immediately brought to the City's attention.

4. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans and as specified.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot install the pipe into the trench without getting earth into it, the City's Inspector may require a heavy tightly woven canvas bag of suitable size, or plastic caps, be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe. As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling, and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.

Joints shall be assembled in accordance with the manufacturer's instructions. Each joint shall be checked with a feeler gauge to assure proper seating of the gasket.

5. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for inserting valves, fittings, or closure pieces, shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe.

6. Allowable Deflection - The maximum allowable angular deflection at the joints shall be 80 percent of manufacturer's recommendation for push-on and mechanical joints.
7. Locating Wire – Locating wire shall be installed with all water supply pipe as indicated in EID Standard Drawing W19.
8. Warning Tape – Warning tape shall be placed on top of pipe zone backfill centered over pipe as shown in EID Standard Drawing W10.

3.03 FITTINGS

A. Fittings shall be installed in the manner specified herein

1. Anchorage for Fittings - All fittings shall be provided with a thrust block constructed against undisturbed soil as shown on the Standard Drawings.

2. Thrust Blocks - Thrust blocks shall be constructed of Class B concrete. Care shall be taken not to obstruct the outlets of tees or crosses, which are intended for future connections. A waterproof paper or plastic bond-breaker shall be placed between plugs and caps and the concrete thrust block to facilitate their removal in the future. Thrust blocks shall be poured against undisturbed earth and shall have at least the minimum dimensions shown in the details on the Standard Drawings.
3. Mechanical Couplings - Oil, scale, rust, and dirt shall be cleaned from pipe ends. The Contractor shall clean gaskets in couplings prior to installing the coupling in accordance with the manufacturer's recommendations.

Bolt threads shall be lubricated with graphite and oil prior to installation.

a. Painting and Coating

- 1) The Contractor shall coat buried flexible pipe couplings, transition couplings, and flanged coupling adapters per Section 09900 and then wrap the couplings with polyethylene wrap per AWWA C-105.
- 2) The Contractor shall coat flexible pipe couplings (including joint harness assemblies), transition couplings, and flanged coupling adapters located indoors, in vaults and structures, and above-ground with the same coating system as specified for the adjacent pipe. A prime coat shall be applied at the factory.

3.04 POLYETHYLENE ENCASEMENT

- A. The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding materials, but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, etc. on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embedment material from becoming trapped between the pipe and the polyethylene.

The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with a minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape.

- B. For installations below the water table, both ends of the polyethylene tube shall be sealed as thoroughly as possible with adhesive tape at the joint overlap.
- C. Installation of polyethylene encasement shall be in accordance with the Standard Drawings and AWWA C-105, Method A. The following summarizes this method.
1. Installation of Polyethylene Encasement for Pipe - Cut polyethylene tube to a length approximately 2 feet longer than the pipe section. Slip the tube around the pipe, centering it to provide a 1-foot overlap on each adjacent pipe section, and bunching it accordion fashion lengthwise until it clears the pipe ends.

Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at the joints to facilitate installation of the polyethylene tube. After assembling the pipe joint, make the overlap of the polyethylene tube. Pull the bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe, and secure it in place. Then slip the end of the polyethylene from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width at the top of the pipe to make a snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points.

Any cuts, tears, punctures, or other damage to the polyethylene, shall be repaired as described below. Proceed with installation of the next section of pipe in the same manner.

2. Installation of Polyethylene Encasement for Appurtenances - Cover bends, reducers, offsets, and other pipe-shaped appurtenances with polyethylene in the same manner as the pipe. When it is not practical to wrap tees, crosses, and other odd-shaped pieces in a tube, the items shall be wrapped with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Polyethylene shall be taped securely in place.
3. Repairs of Polyethylene Encasement - Repair any cuts, tears, punctures, or damage to polyethylene with adhesive tape, or with a short length of polyethylene sheet or a tube cut open, wrapped around the pipe to cover the damaged area, and secured in place.
4. Openings in Polyethylene Encasement - Provide openings for branches, service taps, blowoffs, air valves, and similar appurtenances by making an X-shaped cut in the polyethylene and temporarily folding back the fill. After the appurtenance is installed, tape the slack securely to the appurtenance and repair the cut, as well as, any other damaged areas in the polyethylene, with any resulting damaged areas being repaired, as described above.
5. Junctions with Unwrapped Pipe - Where polyethylene-wrapped pipe joins an adjacent pipe that is not wrapped, extend the polyethylene wrap, to cover the adjacent pipe for a distance of at least 3 feet away from the ductile iron pipe. Service lines of dissimilar metals shall be wrapped with polyethylene or a suitable dielectric tape for a minimum clear distance of 3 feet away from the ductile iron pipe.

3.05 TESTING

- A. Testing shall be performed on all pipelines in accordance with Section 02660.

***** END OF SECTION *****

SECTION 02622
POLYVINYL CHLORIDE PIPE AND FITTINGS (PVC) (PRESSURE FLOW)

PART 1 – GENERAL

1.01 SCOPE

- A. This specification governs the furnishing and installation of PVC pipe material and main line fittings including laying, jointing, bedding, and approvals. All incidentals and appurtenant operations necessary for the construction of water mains shall be done in strict accordance with the drawings and other terms and conditions of the contract.
- B. Fitting types covered under this section include bends, tees, crosses, reducers, couplings, caps, plugs, adapters and all other fittings necessary for a complete pipeline installation.
- C. The Contractor shall also furnish all equipment, tools, labor and materials required to relocate sewers, conduits, ducts, pipes, or other structures as may be necessary to complete the installation as shown and specified.
- D. All standard specifications; i.e., AWWA, ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.
- E. The Contractor shall be responsible for all material furnished by him and shall replace at his own expense, all material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishings of all material and labor required to replace defective material discovered prior to final acceptance of the work.
- F. Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and of integral bell and sleeve reinforced bell sockets shall be free from gouges or other imperfections that might cause leakage.

1.02 STORAGE AND CARE

- A. The Contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe and fittings shall covered or capped to be kept free from dirt and foreign matter at all times.
- B. Pipe shall be stored at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct sunlight for more than 14 days, pipe must be covered with an opaque material while permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation. Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease.

1.03 SUBMITTALS

- A. Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:
 - 1. Pipe and jointing material
 - 2. Fittings
 - 3. Specialties
 - 4. Thrust block mix design
 - 5. Joint Restraints

PART 2 – MATERIALS

2.01 POLYVINYL CHLORIDE PIPE (PVC)

- A. PVC pipe shall conform to AWWA C-900, Class 235 (DR-18), or Class 305 (DR-14) as specified in the plans, and shall have the same outside diameter (O.D.) as that of cast iron pipe (C.I.P.O.D.) in the sizes furnished.
1. Markings - Each standard or random length of pipe shall be clearly marked with the following:
 - a. Nominal size and O.D. base; i.e., 6 inch cast iron pipe size
 - b. Material code "PVC 1120"
 - c. Dimensional ratio; i.e., DR 18 or DR-14 where DR is equal to thickness "divided by" diameter
 - d. AWWA pressure class; i.e., 305 or 235
 - e. AWWA designation "AWWA C-900"
 - f. Manufacturer's trade name and production record code
 - g. Seal (mark) of testing agency
 2. Pressure Class – PVC C-900, Class 235 (DR-18), or Class 305 (DR-14), as specified in the plans, will be installed for typical pipe installation.
 3. Laying Length - The standard laying length shall be 20 feet (plus or minus 1 inch) in all classes. A maximum of 15 percent may be furnished in random lengths of not less than 10 feet each.
 4. Joint Type - Pipe joints shall be made using an integral bell with an elastomeric gasket push-on type joint or using machined couplings of a sleeve type with rubber ring gaskets and machined pipe ends to form a push-on type joint.
 - a. Solvent cement joints are strictly prohibited.
 - b. One coupling complete with one gasket each shall be factory assembled to each length of standard length pipe furnished. The companion gasket for each coupling will be packaged separately for shipment. Couplings shall be the same class as the pipe. Manufacturer shall furnish gasket lubricant for each quantity of pipe furnished. When additional couplings are furnished as separate items, two gaskets shall be furnished and installed in the gasket recess of each coupling.
 5. Couplings – Where couplings are used, they shall meet the requirements of AWWA C-900. Couplings shall be as furnished by the manufacturer. Couplings shall be marked with same information as the pipe.
 6. Physical Test Requirements - Hydrostatic burst and sustained pressure and crushing tests shall be conducted at the factory in accordance with AWWA C-900. All testing shall be subject to inspection by the City. If required, the manufacturer shall supply a letter of certification attesting to their pipe meeting these specifications.
 7. Locating Wire - Locating wire shall be single strand, 10-gauge copper wire, with solid thermoplastic insulation.
 8. Warning Tape - Warning tape shall be 2-inch-wide blue non-metallic tape marked "WATER MAIN."
 9. JM Eagle – JM Eagle Eagle Loc 900 pipe is not permitted for use in this project.

2.02 FITTINGS

- A. Ductile Iron Fittings – All fittings 11-1/4 degrees and greater shall be ductile iron per this specification unless otherwise noted on the contract plans
- B. All fittings shall be rated equally to the class of pipe. End connections may be push-on, mechanical, or flanged joints except where specifically shown otherwise on the plans or Standard Drawings.
- C. All fittings shall be restrained and require thrust blocking per this specification.
- D. Ductile Iron Mechanical Joint Sleeve - Mechanical Joint sleeves shall be allowed for vertical angles equal to or less than 1 1/2 degrees. Fitting angle shall be as specified on the plans or as necessary to achieve the desired minimum cover based on field conditions.
- E. Ductile Iron High Deflection Coupling - High deflection couplings shall be allowed for horizontal angles equal to or less than 1/2 the manufacturers recommendation. Fitting angle is specified on the plans equal to or less than 5 degrees.
- F. Ductile iron compact fittings, per AWWA C153, are allowed.
 - 1. Flanges, Bolts and Gaskets - Flanges shall be flat-faced and meet either the requirements of AWWA C-207 for steel hub type flange fittings, or AWWA C-110 Section 10-18 for ductile iron fittings. The flanges shall be marked with the size, name or trademark of the manufacturer and with the AWWA Class; i.e., "E", or pressure rating.

Bolts and nuts shall be cadmium plated, A307, Grade B of domestic origin. Cadmium plating shall conform to Federal Specification QQ-P-415-1956, Type 1, Class 1.

Gaskets shall be 1/8-inch thick and be of the full face self centered cloth impregnated type. The following table shows the bolt pattern for ASME/ANSI 16.1 Class 125 cast iron flange. This pattern is rated at 275 psi for Class E steel pipe flanges and 250 psi for ductile iron pipe fittings.

Bolt Hole			
Pipe Size	Diameter (Inches)	Bolt Diameter & Length (Inches)	Number of Bolts
6"	7/8	3/4 x 3 1/2	8
8"	7/8	3/4 x 3 1/2	8
10"	1	7/8 x 4	12
12"	1	7/8 x 4	12
14"	1 1/8	1 x 4 1/2	12
16"	1 1/8	1 x 4 1/2	16
18"	1 1/4	1 1/8 x 5	16
20"	1 1/4	1 1/8 x 5 1/2	20

The contractor shall uniformly tighten the bolts and prevent bending or torsional strains. Proper anchorage shall be provided.

2. Mechanical Joint Fittings - The mechanical joints shall meet AWWA C111. That standard covers the joint as well as gaskets and bolts.

T-bolts and nuts shall be manufactured of corrosion-resistant high-strength low-alloy Cor-Ten steel or equal. Number and length of bolts shall be as follows:

Pipe Size	Number of Bolts	Bolt Diameter & Length (Inches)
6"	6	$\frac{3}{4}$ x 3 $\frac{1}{2}$
8"	6	$\frac{3}{4}$ x 4
10"	8	$\frac{3}{4}$ x 4
12"	8	$\frac{3}{4}$ x 4
14"	10	$\frac{3}{4}$ x 4
16"	12	$\frac{3}{4}$ x 4 $\frac{1}{2}$
18"	12	$\frac{3}{4}$ x 4 $\frac{1}{2}$
20"	16	$\frac{3}{4}$ x 4 $\frac{1}{2}$

3. Coatings and Linings – All fittings shall be bituminous lined and coating per AWWA C110.

Threaded holes and mating surfaces shall not be coated. Flange faces shall be coated with asphaltic varnish only. There shall be no coating materials or mortar in gasket grooves.

4. Mechanical Couplings - Couplings include transition couplings, flanged coupling adapters, flexible and insulated couplings.
 - a. Coupling Sleeves and Flanges - Coupling sleeves and flanges may be of gray iron or carbon steel.
 - b. Bolts and Nuts for Flanges - Bolts and nuts for buried and submerged flanges, flanges in underground vaults and structures, and flanges located outdoors above ground shall be cadmium plated, A307, Grade B. Provide one washer for each nut. Each washer shall be of the same material as the nut.

2.03 TRANSITION COUPLING

- A. Scope: The following governs the furnishing and installation of transition couplings.
- B. Manufacturers: Transition couplings shall be Romac 501, Smith-Blair Omni 441, Rockwell 433, or Ford FC1.

2.04 FLEXIBLE COUPLINGS

- A. Scope: The following governs the furnishing and installation of flexible couplings.
- B. Manufacturers: Flexible couplings shall be APAC, Baker 200 series, JCM, Rockwell 400 series or Romac.

2.05 FLANGED COUPLING ADAPTORS

- A. Scope: The following governs the furnishing and installation of flange coupling adapters.

- B. Manufacturers: Flanged coupling adapters shall be Romac FC400 Series, APAC, Baker, JCM, or Rockwell equal. Pipe restraining systems shall be Romac 600 Series, APAC, Baker, JCM, or Rockwell equal.

2.06 RESTRAINT

- A. Custom PVC fittings per this specification shall be restrained using an EBAA Series 2500 joint restraint or approved equal.

2.07 THRUST BLOCKING

- A. Thrust blocking is required at all fittings 11-1/4 degrees or larger in the pipe per these Plans and Specifications.
- B. Refer to Section 03300 – Concrete and Reinforcing Steel for concrete mix requirements and backfill requirements.

PART 3 – EXECUTION

3.01 HANDLING AND TRANSPORTATION

- A. Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.
- B. Heavy canvas, or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.
- C. Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.
 - 1. Rubber Gasket Storage - All rubber gaskets shall be stored in a cool, well-ventilated place and should not be exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

3.02 PIPE LAYING

- A. Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein and in the plans.
 - 1. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.

Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.

Ground water shall not be allowed to enter the pipe.
 - 2. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects just prior to installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the City, who will prescribe corrective repairs or rejection.
 - 3. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the City, shall be provided and used by the Contractor, for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

If damage occurs to any pipe, fittings, valves, hydrants or water main accessories in handling, the damage shall be immediately brought to the City's attention.

4. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans and as specified.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot install the pipe into the trench without getting earth into it, the City Inspector may require a heavy tightly-woven-canvas bag of suitable size, or plastic caps to be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.

As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling, and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.

Joints shall be assembled in accordance with the manufacturer's instructions. Each joint shall be checked with a feeler gauge to assure proper seating of the gasket.

5. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe. The pipe shall be marked around its entire circumference prior to cutting to assure a square cut. A factory-finished beveled end shall be used as a guide for proper bevel angle (15deg) and depth of bevel plus the distance to the insertion reference mark. The end shall be beveled using a PVC pipe beveling tool. Round off any sharp edges on the leading edge of the bevel with a pocket knife or a file.

When installing 8, 10 and 12-inch PVC pipe, mechanical joint or push-on type fittings designed for ductile iron pipe shall be used. When connecting PVC pipe into the bell end of cast iron pipe or into push-on type fittings, the end should be rebeveled, similar to the bevel on ductile iron pipe. When connecting to mechanical joint fittings, the end of the PVC pipe should not be beveled.

6. Allowable Deflection

The maximum allowable angular deflection at each joint shall be zero (0) degrees in any direction. Twelve (12) inch PVC pipe can be joined with high-deflection couplings shall not exceed 5-degree total deflection per coupling

The pipe shall not be deflected at the joints to a lesser radius than the minimum shown below:

Size, inches	Minimum Radius of Curvature, Ft.
6	200
8	250

12	Fitting Required

7. Locating Wire - Locating wire shall be installed as indicated on the Standard Drawings.
8. Warning Tape - Warning tape shall be placed on top of pipe zone backfill centered over pipe as shown on the Standard Drawings.

3.03 FITTINGS

- A. Fittings shall be installed in the manner specified herein for cleaning, laying and joining pipe.
 1. Coat and wrap fittings per specification section 02615.
 2. Anchorage for Fittings - All fittings, unless otherwise specified, shall be provided with a thrust block constructed against undisturbed soil as shown on the Standard Drawings.
 3. Thrust Blocks - Care shall be taken not to obstruct the outlets of tees or crosses which are intended for future connections. A waterproof paper or plastic bond- breaker shall be placed between plugs and caps and the concrete thrust block to facilitate their removal of the concrete in the future. Thrust blocks shall be poured against undisturbed earth and shall have at least the minimum dimensions shown on the Standard Drawings.
 4. Mechanical Couplings - Oil, scale, rust, and dirt shall be cleaned from pipe ends. The Contractor shall clean gaskets in couplings prior to installing the coupling in accordance with the manufacturer's recommendations:
 - a. Bolt threads shall be lubricated with graphite and oil prior to installation.
 - 1) Painting and Coating -
 - a) The Contractor shall coat buried flexible pipe couplings, transition couplings, and flanged coupling adapters per Section 09900 and then wrap the couplings with polyethylene wrap per AWWA C-105.
 - b) The Contractor shall coat flexible pipe couplings (including joint harness assemblies), transition couplings, and flanged coupling adapters located indoors, in vaults and structures, and above-ground with the same coating system as specified for the adjacent pipe. A prime coat shall be applied at the factory.
 5. Polyethylene Wrap - All ferrous metal shall be protected with polyethylene wrap. When it is not practical to wrap tees, crosses, and other odd-shaped pieces in a tube the item shall be wrapped with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Polyethylene shall be taped securely in place.
Cuts, tears, punctures, or damage to polyethylene shall be repaired with adhesive tape, or with polyethylene sheet secured in place with adhesive tape.

3.04 TESTING

- A. Testing shall be performed on all pipelines in accordance with Section 02660.

*** END OF SECTION ***

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**SECTION 02644
FIRE HYDRANT ASSEMBLIES**

PART 1 – GENERAL

1.01 SCOPE

- A. This specification governs materials and installation for the installation for fire hydrant assemblies as shown on the plans. Fire hydrant assemblies includes all items from the main line tee to the fire hydrant as shown on the plans

1.02 SUBMITTALS

- A. Prior to the purchase of fire hydrants to be used in the City system, the following items shall be submitted and approved by the City:
 - 1. Manufacturer's catalog data showing valve type and size to be used, valve dimensions, pressure rating and materials of construction.

PART 2 – MATERIALS

2.01 FIRE HYDRANTS

- A. Fire hydrants shall be dry barrel type meeting AWWA C502 and have a 6-inch bell inlet, 5-1/4-inch main valve with two 2-1/2-inch hose outlets and one 4-1/2-inch pumper connection. Threads on the pumper and hose connections shall conform to the requirements of the fire department equipment of the area which they are to serve or if no standards exist, they shall conform to the "National Standard Screw Threads for Fire Hose Couplings and Fittings" published by the National Board of Fire Underwriters. Hydrants shall be designed to operate at a minimum of 200 psi working pressure and shall be tested hydrostatically to 400 psi. Fire hydrants shall open to the left (counterclockwise). The hydrant shall be cast iron and bronze mounted. Hydrants shall have a main valve opening size of four and one-half inches. The outlets shall be protected with caps attached to the hydrant head with a chain. Other specific requirements are:
 - 1. Hydrant materials shall comply with AWWA C502.
 - 2. Hydrant flanges shall contain six equally spaced bolt holes of 7/8-inch diameter on a 9 and 3/5-inch diameter.
 - 3. All hydrants shall be permanently marked with the manufacturer's name and the year of the manufacture.
 - 4. Caps shall be metal-type.
- B. Acceptable Manufacturers (Only):
 - 1. Mueller Company
 - 2. Clow

2.02 HYDRANT LATERALS

- A. Six-inch ductile iron shall be used. Hydrant laterals shall be pressure rated appropriately. Thrust block sizes shall be as shown in the plans.

2.03 HYDRANT LATERAL VALVE

- A. The lateral valve shall be a 6-inch gate valve. The valve shall be stacked to the surface as shown on the plans.

2.04 SPOOL AND BURY

- A. Hydrant burys shall be 6-inches inside diameters and made of cast iron conforming to ASTM A-126. The burys shall be one piece with the top having a flange drilled with six holes to receive the extension spool or hydrant. The bottom shall have a 90-degree bend. The bury end shall be a push joint or mechanical joint fitting.

2.05 BOLTS

- A. Alloy steel break-off bolts shall be used to attach the fire hydrant to the extension spool.

PART 3 – EXECUTION

3.01 EXAMINATION OF MATERIAL

- A. Prior to installation, all hydrants shall be inspected for direction of opening, nozzle threading, operating-nut and cap-nut dimensions, tightness of pressure-containing bolting, cleanliness of inlet elbow, handling damage, and cracks. Defective hydrants shall be corrected or held for inspection by the City.

3.02 PLACEMENT OF HYDRANT

- A. All hydrants shall stand plumb and shall have their nozzles parallel with or at right angles to the curb, with pumper nozzle facing the curb.

3.03 ASSEMBLY INSTALLATION

- A. The shoe of the fire hydrant bury must be anchored on a concrete thrust block.
- B. The fire hydrant shall be positioned so that the bolts between the extension piece and the hydrant are accessible, both top and bottom, within the limits shown on the Standard Drawing. If the hydrant is either too low or too high, it shall be corrected.
- C. Painting shall be per Section 09900 with all metal surfaces above ground being painted, including any extensions. The extension piece shall be painted before installation. Color of hydrant will be determined by the local fire department.
- D. All underground iron fittings shall be wrapped with polyethylene.

3.04 TESTING

- A. Hydrants are to be tested at same time with the main. Dry-barrel hydrants shall have the drain valves tested in the following manner:
 - 1. Following the pressure test, open fire hydrant valve a few turns and allow hydrant to fill until water is at bottom of nozzle.
 - 2. Close hydrant valve and observe water level drop. If drop in water level is not visible, place palm of hand over open nozzle to feel a noticeable suction. If water level drop is not detectable, the hydrant has failed the drainage test.
 - 3. If the hydrant fails the drainage test, the drain valve may be clogged or backfill material does not permit free drainage. The Contractor shall make the necessary corrections and repairs to correct improper drainage.

***** END OF SECTION *****

SECTION 02660
WATER PIPING SYSTEM PRESSURE TESTING

1.0 GENERAL

- 1.1 Scope** - All completed waterlines, as well as the service assemblies and appurtenant structures, shall be tested by the Contractor in the inspector's presence prior to field acceptance of the work. The Contractor shall correct all defects in workmanship or materials which become evident by inspection or testing at any time during the work. Unless otherwise stated in this standard, all material utilized in the installation of new water mains shall comply with the California Waterworks Standard as currently amended and meet all AWWA standards that are hereby incorporated by reference.

Testing shall be done after the complete installation and compaction of all underground utilities, except as modified below:

Multiple pressure tests and disinfection operations are expected to be required as segments of new main are ready to be placed into service. The contractor may segment pressure testing of the new main into phases treating each as an independent main and tie-in.

The Contractor shall furnish all pipe and fittings for connection to the main, pumps, pressure regulator, a calibrated water storage tank, disinfectant, and all other materials, fittings and pipelines required to perform the tests and make the necessary repairs. All equipment required for testing purposes that comes into contact with drinking water must be NSF 61 approved. All chemicals used for the construction, testing and disinfection of water mains shall be NSF/ANSI 60 approved.

When lines to be tested are in areas that will be paved, testing shall be done after subgrade is placed and compacted. At Engineer's discretion, testing may be performed after subgrade has been accepted. No lines eligible for final testing shall be accepted as passing until all underground construction that may disturb the waterline is compacted.

Pressure testing the new waterline shall conform (at a minimum) to the applicable AWWA standard for the pipe material being installed as required by the California Code of Regulations, Title 22. Testing shall not commence until the water main (or water main segment) and all appurtenances have been completely installed. The Contractor may, at any time and at his expense, perform his own pressure and leak test; however these tests will in no way offset the requirement for a final pressure and leak test.

Technical Specification 02661, Disinfecting Water Mains, covers the disinfection process. All pressure pipelines shall be hydrostatically tested prior to introducing chlorine to the new pipeline.

2.0 MATERIALS

- 2.1 **General** - All test equipment, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor, subject to the District's review. No materials shall be used which would be injurious to the construction or its future function.
- 2.2 **Hydrostatic Testing Equipment** - The Contractor shall be responsible for supplying and operating all testing equipment. In general, the testing equipment configuration shall consist of a pump receiving water from a calibrated storage tank. The pump discharge shall enter the water main through a tap or appurtenance. A pressure sustaining valve shall be placed on a tee located in the pump discharge line. Discharge from the pressure sustaining valve shall return to the calibrated storage tank. Other types or configurations of testing equipment shall be subject to District approval. The pressure pump shall operate continuous throughout the testing period. If the pump is stopped, the pressure shall not be allowed to drop more than two psi below test pressure before starting the pump.

3.0 EXECUTION

- 3.1 **General** - The Contractor shall make all necessary provisions for conveying the water from the City designated source to the points of use at the Contractor's own cost.

Release of water from pipelines, after testing and disinfecting have been completed, shall be in accordance with a written disposal plan reviewed by the Engineer.

- 3.2 **Hydrostatic Testing** - The purpose of the hydrostatic test is both to test the ability of the pipeline to withstand pressure and test for allowable leakage. All hydrostatic testing shall follow the test setup and pressurization procedures as described in AWWA C600, C604, and C605. The following exceptions shall be incorporated into the testing procedure as outlined below:

- A. **Preparation** - The line shall be filled with water at least 24 hours prior to testing when the pipeline has a mortar lining, thus allowing the lining material to become saturated. Water for testing shall be introduced at the low end of the section being tested to facilitate the elimination of air in the pipeline prior to testing. All pressure gauges used for determining hydrostatic testing shall be liquid filled and shall be capable of operating above the prescribed line test pressure. Gauges shall provide adequate visible ranges to allow accurate measurement for allowable leakage calculation. The Engineer reserves the right to reject provided gauge that does not meet this specification.
- B. **Test Section Length** - The length of pipe being tested at any one time shall not exceed 2,000 linear feet unless otherwise approved by the City.

- C. Test Pressure – The test pressure shall be 200 PSI or as outlined in C600, C604, or C605, whichever is greater, measured at the lowest point of the section of the pressure zone being tested.
- D. Test Duration - Pressure in the water main shall be maintained within two psi of the calculated test pressure for a minimum of 2 hours.
- E. Allowable Leakage - The allowable leakage per test section shall be calculated from the formula contained in this subsection. Different sized water mains that might be contained within the same test section shall be calculated separately and then added together.

$$L = \left(SD \frac{\sqrt{P}}{148,00} \right) \times 2$$

WHERE:

L = Testing allowance in Gallons (For a 2 Hour Test).

S = Length of pipeline tested in Feet.

D = Nominal diameter in Inches.

P = Average test pressure during the hydrostatic test in PSI.

- F. Repairs - During the pressure and leakage test, all accessible appurtenances shall be inspected for visual signs of leakage. All visual leaks shall be corrected immediately, regardless of the amount of leakage, and the test shall be run again for its full duration. All leaks detected shall be repaired to a water tight condition. All repairs made shall be retested in accordance with the specifications. All repairs shall be made and a successful test accomplished prior to taking base bacteriological samples for the Disinfection Process.

***** END OF SECTION *****

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SECTION 02661 DISINFECTING WATER MAINS

1.0 GENERAL

1.1 Scope - All completed waterlines, as well as the service assemblies and appurtenant structures, shall be tested by the Contractor in the inspector's presence prior to field acceptance of the work. In compliance with the California Code of Regulations, Title 22, only certified Distribution Operators are allowed to make decisions addressing the following:

1. Install, tap, re-line, disinfect, test and connect water mains and appurtenances.
2. Shutdown, repair, disinfect and test broken water mains.
3. Oversee the flushing, cleaning, and pigging of existing water mains.
4. Pull, reset, rehabilitate, disinfect and test domestic water wells.
5. Drain, clean, disinfect, and maintain distribution reservoirs

The Contractor shall correct all defects in workmanship or materials which become evident by inspection or testing at any time during the work. Unless otherwise stated in this standard, all material utilized in the installation of new water mains shall comply with the California Waterworks Standard as currently amended and meet all AWWA standards that are hereby incorporated by reference.

Testing shall be done after the complete installation and compaction of all underground utilities. However, multiple pressure tests and disinfection operations are expected to be required as segments of new main are ready to be placed into service. The contractor may segment disinfection operations and testing of the new main into phases treating each as an independent main and tie-in.

The pipeline must be hydrostatically tested, per the Technical Specification 02660 prior to disinfection except as modified below:

The Contractor shall furnish all pipe and fittings for connection to the main, pumps, pressure regulator, a calibrated water storage tank, disinfectant, and all other materials, fittings and pipelines required to perform the tests and make the necessary repairs. All equipment required for testing purposes that comes into contact with drinking water must be NSF 61 approved. All chemicals used for the construction, testing and disinfection of water mains shall be NSF/ANSI 60 approved.

When lines to be tested are in areas that will be paved, testing shall be done after subgrade is placed and compacted. At Engineer's discretion, testing may be performed after subgrade has been accepted. No lines (eligible for final

testing) shall be accepted as passing until all underground construction that may disturb the waterline is completed.

1.2 Procedure – All waterlines shall follow the procedure outlined below:

- A. Prevent contaminating materials from entering the water main during storage, construction, or repair. All materials that are stored shall have covered ends prior to being installed. All pipelines shall be swabbed to remove any debris that may have come into contact with the pipe during transportation. The swab shall be a dry or damp cloth, and shall not under any circumstances be saturated with a chlorine mix. The purpose for the swab is solely to remove debris and is in no way a form of disinfection.
- B. Fill the new waterline slowly to remove all air pockets followed by flushing at a minimum of 3 feet per second or an approved velocity or volume to remove any material that may have entered the water main during construction.
- C. Pressure test the new waterline to Technical Specification 02660 and conforming (at a minimum) to the applicable AWWA standard for the pipe material being installed as required by the California Code of Regulations, Title 22. Testing shall not commence until the water main and all appurtenances have been completely installed and are set to final grade. The Contractor may, at any time and at his expense, perform his own pressure and leak test; however these tests will in no way offset the requirement for a final pressure and leak test.
- D. Prior to disinfection, a sampling plan for the bacteria and standard heterotrophic plate count (HPC) must be created by a licensed Distribution Operator and submitted to the Engineer for review. The samples can be collected at the approved representative locations.
- E. The new pipeline shall be chlorinated utilizing an AWWA approved method only. After chlorination residuals have been verified the super-chlorinated water shall be flushed from the main following all AWWA procedures.
- F. After the new pipeline has been qualified by City staff, the Contractor can schedule a tie-in to the City system. The Contractor shall provide a written or e-mail notice to the Engineer a minimum of 5 working days before the proposed scheduled tie-in. City approved tie-in days are Tuesday-Thursday. Requests for exceptions shall be provided to the City for review. The City reserves the right to adjust tie-in days based on system operation.

1.3 Submittals - The Contractor shall notify the City a minimum of three business days in advance of its proposed testing schedule for review and concurrence. The Contractor's proposed plans for water conveyance, disinfection, control, and disposal, shall also be submitted in writing.

2.0 MATERIALS

- 2.1 **General** - All test equipment, chemicals for chlorination, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor, subject to City review. No materials shall be used which would be injurious to the construction or its future function.
- 2.2 **Chlorine** - Chlorine for disinfection shall be in the form of liquid chlorine, sodium hypochlorite solution only. Sodium hypochlorite shall be in accordance with requirements of AWWA B300. Sodium hypochlorite shall be certified as suitable for contact with or treatment of drinking water in accordance with NSF 60, Drinking Water Treatment Chemicals-Health Effects. Liquid chlorine shall be used only:
1. Under the direct supervision of a licensed Distribution Operator.
 2. When appropriate safety practices are observed.

3.0 EXECUTION

- 3.1 **General** - The Contractor shall make all necessary provisions for conveying the water from the City designated source to the points of use.

All pressure pipelines shall be hydrostatically tested prior to introducing chlorine to the new pipeline. Disinfection shall be accomplished by chlorination and shall be completed by the Contractor. All chlorinating and testing operations shall be performed in the presence of the City. Per California Title 22, water systems shall utilize only certified Distribution Operators to make decisions addressing the disinfection, testing, and tie-in of new water mains and appurtenances to existing systems.

Disinfection operations shall be scheduled by the Contractor as late as possible during the contract time period so as to assure the maximum degree of sterility of the facilities before the work is accepted by the City. A bacteriological test and a standard heterotrophic plate count shall be performed by the City. However, it is acceptable to the City that the Contractor tie-in segments of new water main as they are ready for service.

Release of water from pipelines, after testing and disinfecting have been completed, shall be in accordance with a written disposal plan reviewed by the Engineer. All dechlorination equipment shall be capable of handling high flows with high levels of chlorine as required for adequate flushing of the new pipeline. The Contractor shall provide all documentation for acceptable reagents that will be used during the dechlorination process for review a minimum of 4 days prior. Discharges of highly chlorinated water that can make it to waters of the state or waters of the US are not allowed. Chlorinated water may only be discharged from a sampling apparatus (service line sample point, blow off sample point, fire hydrant sample point, air release valve sample point, etc.) of less than five gallons during disinfection verification only as approved by the licensed Distribution Operator.

3.2 Disinfecting - After completion of pressure testing operations, the Contractor shall flush and then sterilize all water mains, services, and appurtenances. All sterilization shall follow the procedures as described in AWWA C651. The following exceptions shall be incorporated into the testing procedure as outlined below:

- A. Flushing – Where flow rates are not possible, flushing at the maximum expected flow rate for the pipeline for 4 volumes can be approved by the Engineer.
- B. Disinfection Methods - Disinfection shall only consist of the continuous feed method or the slug method. No tablet or granule methods are allowed for disinfection of City waterlines.
- C. Filling and Contact - Potable water shall be supplied from a temporary backflow connection to the existing system. The Contractor has two options when connecting to fill the new pipeline. Option one the Contractor can check out a City owned temporary water use meter and backflow device that will be tested and placed into service by the City. Option two the Contractor can provide a backflow for the temporary connection to be tested by City staff before the device can be placed into service. Precautions shall be taken to assure that air pockets are eliminated.

All appurtenances shall be sampled for both methods to verify that adequate disinfection has been met. This testing includes all verifications for the 3 hour or 24 hour chlorination procedures. These samples include but are not limited to all service lines, hydrants, water quality sampling stations, blow offs, and air releases. Sampling small diameter lines including services and air releases shall be completed within 10-15 seconds under a pencil sized flow. The service shall not be flushed as to take a sample from the main, but rather verify that the service line is completely disinfected. Fire hydrants and blow offs shall be sampled within 20 seconds of initializing a low flow. All water discharged shall be adequately de-chlorinated or control land applied as to not have any run off. Control land applies to less than five gallons at one location during testing verification only.

- D. Final Flushing - Per the City's statewide National Pollutant Discharge Elimination System (NPDES) permit, no super-chlorinated water shall be discharged without proper notification and an appropriate neutralizing agent. The environment to which the chlorinated water is to be discharged shall be inspected then a reducing agent shall be applied to the water to be wasted to thoroughly neutralize the chlorine residual remaining in the water. The NPDES permit requires that the City notification for planned large discharges be submitted a minimum of 72 hours prior. The Contractor is required to provide the City a minimum of 4 days notification for any planned large water discharges. For any development projects related to final flushing all work shall be completed under the project specific NPDES permit. The Contractor is made aware

to refer to the project specific NPDES permit prior to commencing flushing activities.

The system shall be flushed until chlorine levels of discharged flushing water are determined to be identical as the chlorine level of the potable water supplied from the temporary backflow connection from the existing system. This residual chlorine reading shall be recorded by the City and used as a baseline for residual chlorine testing which shall be performed 16 hours after final flushing.

- E. Residual Chlorine Testing – 16 hours after final flushing and prior to bacteriological testing, residual chlorine samples shall be collected by a certified City distribution system operator at all appurtenances including residential services. If any residual chlorine sample is found to have dropped below 0.10 mg/l, or dropped $\geq 40\%$, the Contractor will be required to flush the new pipeline again, and re-sample after another 16 hour period. The Contractor may be required to re-chlorinate and re-disinfect if the pipeline fails residual chlorine testing a second time. The determination of the extent of the flush or re-chlorination shall be determined by licensed City operator based on the sample results.
- E. Bacteriological Tests – After residual chlorine levels have been confirmed to be compliant, an HPC and total coliform test shall be collected. If the HPC is greater than 500 CFU/mL then the Contractor will be required to flush the new pipeline again, or re-disinfect, and re-sample until no coliform are present and the HPC is < 500 CFU/mL per AWWA standard C651-14. The determination of the extent of the flush or re-chlorination shall be determined by licensed City staff based on the sample results.

Should any of the samples fail to meet minimum State of California, Department of Public Health requirements, the Contractor shall continue to chlorinate and flush the system, as directed, until a satisfactory sample is obtained. The Contractor is responsible for all costs associated with additional flushing and/or re-chlorination of the new pipeline.

NOTE: High velocities in the existing system, resulting from flushing the new main, may disturb sediment that has accumulated in the existing mains. When check samples are taken, it is well advised to also sample water entering the new main.

***** END OF SECTION *****

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**SECTION
02670
ABANDONMENT OF FACILITIES**

PART 1 – GENERAL

1.01 SCOPE

- A. This section governs abandonment of pipelines, services, valve and meter, and other existing structures.

1.02 SUBMITTALS

- A. Upon request, schedules and method of abandonment shall be submitted to the City for approval.

PART 2 – MATERIALS

2.01 GENERAL

- A. Concrete, fittings, backfill material and other material used for abandonment shall comply with Specification 03300 – Concrete.

2.02 FACILITY ABANDONMENT

- A. Concrete plugs shall be used to cap the ends of pipelines as shown on the plans.
- B. The sand shall consist of clean grains of hard, strong, durable materials, free from alkali, organic matter or other deleterious substances. The flowability shall be 100%.
- C. The Contractor shall not use quick-setting cement, accelerators or other constituents, without the Engineer's written approval.
- D. Materials
 - 1. Compressive Strength. Grout shall have a minimum penetration resistance of 100 psi in 24 hours when tested in accordance with ASTM C403 and a minimum compressive strength of 300 psi in 28 days, and maximum compressive strength of 600 psi in 28 days when tested in accordance with ASTM C495 or C109.
 - 2. Shrinkage. The grout shall have less than one percent shrinkage by volume.
 - 3. Viscosity. The apparent viscosity shall not exceed 35 seconds in accordance with ASTM C939.
 - 4. Provide mix design in accordance with ACI and ASTM standards for approval.
 - 5. Provide mix design in accordance with ASTM standards for approval.

PART 3 – EXECUTION

3.01 PIPELINES

- A. Procedures (Pipe Abandonment)
 - 1. All existing pipelines shall be abandoned in place as shown in the plans. The

ends of the pipeline to be abandoned shall be cut and capped with a minimum of 2-feet of concrete mixture. No pipeline shall be abandoned until the new pipeline system and all services are installed, tested and in service. An abandonment plan must be prepared by the Contractor and approved by the City prior to abandonment of any facilities.

2. Cement slurries – Neat cement or concrete slurries shall be prepared by adding cement or sand-and-cement to the calculated required volume of clean water. The material shall be mixed in the mixing equipment until it is adequately mixed and free of lumps, then immediately pumped into the pipe without delay.

3.02 SERVICE LATERALS

- A. Typically laterals will be abandoned in place and replaced. No portion of the previous service lateral shall be present inside the meter box after abandonment. Service shall be cut and capped below grade to avoid accidental reconnection.

3.03 STRUCTURES (VALVE BOXES)

- A. Valve boxes to be abandoned shall be removed to a point 12 inches below the proposed street grade or ground surface and filled with $\frac{3}{4}$ -inch crushed rock for pipeline trench backfill or cement slurry, where in the street and filled with top soil where in front yards.

3.04 DISPOSAL OF MATERIALS

- A. Contractor is responsible to legally dispose of all materials (including existing AC Pipe removed during abandonment and tie-ins). Reference Section 01354 for additional information.

**** END OF SECTION ****

**SECTION 03003
PRECAST CONCRETE STRUCTURES**

PART 1 – GENERAL

1.01 DESCRIPTION

A. Section Includes:

1. Valve box (City to provide to Contractor)

PART 2 – PRODUCTS

2.01 PRECAST CONCRETE

- A. Precast box's shall set in place per the contract drawings and as specified herein.
 1. Precast structures shall be in accordance with ASTM C478.
 2. Structure bottom and sides shall be a single unit with penetration predrilled or precast based on contract drawings and field exploration.
- B. Concrete shall have a compressive strength (f'_c) of 5,000 psi and shall conform to Caltrans Standard Specification Section 51: Concrete Structures.
- C. All reinforcing steel (rebar) shall have yield strength (f_y) of 60,000 psi and shall conform to Caltrans Standard Specification Section 52: Reinforcement.
 1. All reinforcing steel bars shall conform to the standard specifications for deformed billet steel for concrete reinforcement, ASTM Designation A615.
 2. Provide rebar with ACI Class B lap splice minimum unless otherwise noted. Stagger lap splices 24 inches minimum.
 3. Unless otherwise noted, maintain 2" coverage to the face of the bar.
- D. Precast concrete structures shall be designed and stamped by a licensed professional Engineer registered in the State of California. The manufacturer of the structures shall provide complete design calculations for review and approval.
- E. Exposed surfaces of pre-cast structures shall be coated with:
 1. One (1) coat Dunn Edwards "Super-Loc" W718 or approved equal.
 2. Two (2) coats Dunn Edwards "Endurawall" W370 – 100% acrylic elastomeric wall coating or approved equal.

PART 3 – EXECUTION

3.01 STRUCTURE EXCAVATION

- A. Excavation shall be to the lines, grades, and dimensions shown on the drawings. The original material at foundation surfaces shall be undisturbed and carefully graded. Where unsuitable material is found at planned foundation grade it shall be removed to a depth as directed by the Engineer, and replaced with structure backfill placed and compacted as specified herein. If directed by the Engineer, minor disturbance can be repaired by scarifying, moisture-conditioning, and recompacting the native material in place.
- B. Foundations: Surfaces upon or against which concrete is to be placed shall be free of standing water, mud, debris, and loose material. The surfaces shall be inspected and approved by the Engineer before any concrete is placed.

3.02 STRUCTURE BACKFILL

- A. Structure backfill shall be compacted to a relative compaction of not less than ninety- five percent (95%) relative compaction. Relative compaction is based on laboratory test procedure ASTM D-1557.

**** END OF SECTION ****

**SECTION 03300
CONCRETE AND REINFORCING STEEL**

PART 1 – GENERAL

1.01 SCOPE

- A. This specification includes concrete materials, mixing, placement, formwork, reinforcement and curing.

1.02 SUBMITTALS

- A. Prior to placement, the following shall be submitted:
1. Supplier's concrete mix data sheet showing contents and proportions of cement, aggregate, water, and any admixtures.
 2. Reinforcing steel schedule, if requested.

PART 2 – MATERIALS

2.01 CONCRETE

- A. Portland cement concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in the Caltrans Standard Specifications Section 90, "Portland Cement Concrete".
- B. Concrete for each portion of the work shall be of the class as shown below, for the type of work performed.

Caltrans Class	Type of Work	Max. Slump (inches)
A	All reinforced structures, manhole bases, piers, vaults	4
B	Anchors, thrust blocks, encasements, cradles, and miscellaneous unreinforced concrete (2500 psi comp. strength)	4
	Maximum water/cement ratio to be 0.55	

- C. Rapid setting concrete may be used. Accelerating admixtures may be added to the concrete mix as approved by the City.

2.02 GROUT

- A. Grout shall be composed of 1 part Type II Portland Cement to 1½ parts sand. The sand shall be washed, well-graded sand such that all will pass a No. 8 sieve. Water shall be clean potable water. The quantity of water to be used in the preparation of grout shall be the minimum required to produce a mixture sufficiently workable for the purpose intended. Grout shall attain a minimum compressive strength of 2,000 psi in 28 days.
- B. Rapid setting, non-shrink, "5-minute" grout may be used or required in certain circumstances as approved by the City.

2.03 REINFORCING STEEL

- A. Reinforcing steel shall conform to ASTM A 615, Grade 60.
- B. Reinforcing steel shall be fabricated in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute. Reinforcing steel shall be delivered to the site bundled and tagged for identification.

2.04 TIE WIRE

- A. Tie wire shall be 16 gage minimum, black, soft annealed.

2.05 BAR SUPPORTS

- A. Bar supports in beams and slabs exposed to view after form stripping shall be galvanized or plastic coated. Concrete supports shall be used for reinforcing concrete placed on grade.

2.06 FORMS

- A. Forms shall be accurately constructed of clean lumber and shall be braced to provide sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure and consolidation without deflection from the prescribed lines.
- B. The surface of forms against which concrete is placed shall be smooth and free from irregularities, dents, sags, or holes. The surface shall leave uniform form marks conforming to the general lines of the structure.

PART 3 – EXECUTION

3.01 FORMWORK

- A. The Contractor shall notify the City a minimum of one working day before his intended placement of concrete to enable the City to check the form lines, grades, and other required items before placement of concrete.
- B. Unless otherwise indicated on the plans, all exposed sharp concrete edges shall be 3/4-inch chamfered.
- C. Before placing concrete, the form surface shall be clean and coated with form oil of high penetrating qualities where applicable.

3.02 REINFORCEMENT

- A. Reinforcing steel shall be placed in accordance with the current edition of Recommended Practice for Placing Reinforcing Bars, published by the Concrete Reinforcing Steel Institute.
- B. All reinforcing steel shall be of the required sizes and shapes and placed where shown on the drawings.
- C. Reinforcing steel shall not be straightened or re-bent in a manner that will damage the material. The Contractor shall not use bars with bends not shown on the drawings. ALL STEEL SHALL BE COLD BENT - DO NOT USE HEAT.

- D. All bars shall be free from rust, scale, oil, or any other coating which would reduce or destroy the bond between concrete and steel.
- E. Reinforcement steel shall be positioned in accordance with the drawings and secured by using annealed wire ties or clips at intersections and supported by concrete or metal supports, spacers, or metal hangers. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage. Bars, additional to those shown on the drawings, which may be found necessary or desirable by the City for the purpose of securing reinforcement in position, shall be provided.
- F. All reinforcing steel and wire mesh shall be completely encased in concrete. Reinforcement shall be placed a minimum of 2-inches clear of any metal pipe or fittings. The reinforcement shall be so secured in position that it will not be displaced during the placement of concrete.
- G. Reinforcing dowels shall be secured in place prior to placing concrete. The Contractor shall not press dowels into the concrete after the concrete has been placed. The minimum lap for all reinforcement shall be 40 bar diameters. Additional reinforcement shall be placed around the pipe or openings as indicated in the drawings.
- H. Wire mesh reinforcement is to be rolled flat before being placed in the form. The Contractor shall support and tie wire mesh to prevent movement during concrete placement. Welded wire fabric shall be extended to within 2 inches of the edges of the slab. Splices shall be lapped at least 1½ courses of the fabric and a minimum of 6 inches. Laps and splices shall be securely tied at ends and at least every 24 inches with 16-Gage black annealed steel wire. The Contractor shall pull the fabric into position as the concrete is placed by means of hooks, and then work concrete under the steel to ensure that it is at the proper distance above the bottom of the slab.

3.03 EMBEDDED ITEMS

- A. All embedded bolts, dowels, anchors and other embedded items shall be held correctly in place in the forms before concrete is placed.

3.04 MIXING AND PLACING CONCRETE

- A. Concrete, either ready mix or batch mixed, shall be placed in the forms before taking its initial set. No concrete shall be placed in water except with approval of the City.
- B. As the concrete is placed in the forms, or in excavations to be filled with concrete, it shall be thoroughly settled and compacted throughout the entire layer by internal vibration and tamping bars. Concrete shall not be permitted to fall more than 6 feet and shall be deposited as nearly as practicable to its final position.
- C. All concrete surfaces upon which or against which the concrete is to be placed, and to which new concrete is to adhere, shall be roughened, thoroughly cleaned, wet or sandblasted to bare aggregate as directed. An approved bonding agent shall be used before the concrete is deposited.

3.05 CONCRETE FINISHING

- A. Immediately upon the removal of forms, all voids shall be neatly filled with cement mortar.
- B. The surfaces of concrete to be permanently exposed to view shall be smooth, free from projections, and thoroughly filled with mortar.

- C. Exposed surfaces of concrete not finished against forms, such as horizontal or sloping surfaces, shall be screened to a uniform surface and worked with suitable tools to a light broom finish.

3.06 PROTECTION AND CURING OF CONCRETE

- A. The Contractor shall protect all concrete against damage. Exposed surfaces of new concrete shall be protected from the direct rays of the sun and from frost by being kept damp for at least two weeks after the concrete has been placed, or by using an approved curing process.

3.07 THRUST BLOCKS

- A. Thrust Blocks shall be placed against undisturbed soil and allowed to setup for a minimum of 24-hours before being backfilled. Contractor shall be responsible for all trench plate related cost including but not limited to furnishing, placing and removing.

***** END OF SECTION *****

**SECTION 05999
ANCHOR/EXPANSION BOLTS AND MISCELLANEOUS METALS**

PART 1 – GENERAL

1.01 SCOPE

- A. This specification covers the installation and fabrication of metal shapes, plates, rods, bars castings checkered floor plate and the installation of expansion and epoxy set anchors for equipment and structures.

1.02 SUBMITTALS

- A. Prior to installation the following shall be submitted by the City and approved.
- B. Manufacturer's catalog data and detail sheets showing size, material and installation procedures.

PART 2 – MATERIALS

2.01 ANCHOR AND EXPANSION BOLTS

- A. Materials shall meet the following specifications.
 - a. All above ground hardware shall be stainless steel.
- 1. Bolts:
 - a. Carbon steel: ASTM A307.
 - b. Stainless steel: ASTM 276, Grade 316.
 - c. Galvanized steel: Carbon steel, hot-dip galvanized, ASTM A153; or zinc plated ASTM A164 type GS.
- 2. Nuts:
 - a. Same material as bolts.
 - b. Carbon steel: ASTM A307, Grade B heavy hexagonal.
 - c. Stainless steel: ASTM 276, Grade B heavy hexagonal.
 - d. Self-locking: Prevailing torque, IFI-100, grade A.
- 3. Washers:
 - a. Same material as bolts.
 - b. Flat: ANSI B27.2.
 - c. Locking: Spring type ANSI B27.1.
- 4. Sleeves:
 - a. Pipe: ASTM A120, galvanized.
 - b. Bearing Plates: ASTM A36, galvanized.
- 5. Expansion anchors:
 - a. FS FF-S-325.
 - b. In hardened concrete:
 - 1) Wedge type: Group II, Type 4, Class I
 - 2) Self-drilling: Group III, Type I.
 - 3) Non-drilling, internally threaded: Group VIII, Type 1.
 - 4) Non-drilling, externally threaded: Group VIII, Type 2.

- c. In masonry:
 - 1) Lag shield: Group II, Type 1, Class 1.
 - 2) Split sleeve: Group II, Type 3, Class 3.
- 6. Epoxy set anchors:
 - a. FS FF-S-325
 - b. In hardened concrete:
 - 1) Parabond capsule anchors.
 - 2) Ceramic 6 epoxy threaded rod anchors.
 - 3) Stainless steel studs, nuts and washers.

2.02 MISCELLANEOUS METAL

A. Materials that meet the following specifications are acceptable:

- 1. Steel:
 - a. Plates and shapes: ASTM A36.
 - b. Sheets: ASTM A366 or A569 zinc coated.
 - c. Pipe: ASTM A120.
 - d. Bolts:
 - 1) High strength: ASTM A325.
 - 2) Unfinished: ASTM A307.
 - 3) Self-locking nuts: Prevailing torque type; IFI-100, Grade A.
 - 4) Flat washers: ANSI B27.2.
 - 5) Lock washers: Spring type, ANSI B27.1.
 - 6) Beveled washers: Table 1 of Specifications for Structural Joints Using ASTM A325 or A490 Bolts, AISC Steel Construction Manual.
 - e. Welds:
 - 1) Part 5 Specifications and Codes, AISC Steel Construction Manual.
 - 2) AWS D1.1-77 American Welding Society.
 - 3) Welding Electrodes: AWS 5.20 E70TX
 - f. Checkered plate: FS QQ-F-461.
- 2. Cast iron: ASTM A48, Class 25 or better
- 3. Stainless steel: 18-8
 - a. Plates: ASTM A167
 - b. Bolts: IFI-104, Grade 303 or 305
- 4. Aluminum:
 - a. Sheet and plate: ASTM B209, alloy 6061-T6.
 - b. Rolled sections: ASTM B308, alloy 6061-T6.
 - c. Rod and bar: ASTM B211, alloy 6061-T6 or 2017-T4.
 - d. Extrusions: ASTM B221, alloy 6063-T5 or T6.
 - e. Pipe: ASTM B429, alloy 6061-T6 or 6063-T6.
 - f. Rivets: ASTM B316, alloy 6061-T6.
 - g. Bolts: IFI-104, Grade 24T4.
 - h. Castings: ASTM B26 or B85.
 - i. Checkered plate: Alcoa C102.
- 5. Shop Coatings:
 - a. Provides shop coatings per Section 09900:

- 1) Rust inhibitive shop primer for steel.
- 2) Zinc rich primer.
- 3) Coal tar paint.
- b. Galvanizing.
 - 1) Bolt galvanizing:
 - a) Zinc: ASTM A164, Type GS.
 - b) Cadmium: ASTM A165, Type NS.
 - 2) Aluminum.
 - a) Standard mill finish.
 - b) Clear anodize.

2.03 FABRICATION

- A. All items shall be fabricated in accordance with dimensions, arrangement, sizes and weights or thickness indicated on drawings or specified. All members shall be free of winds, warps, local deformations or unauthorized bends. Holes and other provisions for field connection shall be accurate and shop checked for proper fit. All field connection materials shall be provided. Anchor bolts shall be ¾-inch minimum L shape hook type unless indicated otherwise on plans. Expansion anchors shall be ¾-inch maximum and Epoxy set anchors shall be ¾-inch minimum.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Before assembly, thoroughly clean all parts which will be in contact with each other.

3.02 INSTALLATION

- A. All installation shall be done according to the following:
 1. General – Assemble all parts accurately as indicated on the Drawings. Set base plates level and grout in place. Verify that holes for anchor bolts in forms and templates match applicable equipment shop drawings.
 2. Connections – Where welding is permitted or required, butt, miter, and fillet welds shall be continuous. Exposed welds shall be ground smooth. Intermittent welds shall have a minimum effective length of 2 inches and maximum spacing of 6 inches.

Light drifting is permitted to draw parts together. Enlarge holes, if necessary, by reaming with twist drills. Burning is not allowed to enlarge holes.
 3. Anchor bolts – Where installed in cast-in-place concrete, install a nut on the concrete side of the form or supporting template. Provide three (3) nuts for each anchor bolt for which a lock nut is indicated, two (2) for others.

Sleeved anchor bolts shall be centered in pipe sleeve. Sleeve ID shall be approximately 2-1/2 times bolt OD and sleeve length shall be approximately eight (8) times bolt OD. Bearing plate minimum thickness shall be ½ times bolt OD.

Through bolts shall be sleeved when used with bearing plates. Bearing plates shall be welded to bolt and plate welded to sleeve.
 4. Expansion anchors – Install expansion anchors according to the manufacturer's instructions. Minimum hole depth shall be 4-bolt diameters and the minimum

distance between expansion anchor centerline and any edge or exterior corner of concrete shall be 4-1/2 bolt hole diameters.

5. Epoxy set anchors – Install epoxy set anchors according to manufacturer's recommendation clean hole and inspect prior to installation. Minimum hole depth shall be according to manufactures recommendation but not less than 6-5/8 inches. Diameter of drilled holes shall be according to ANSI B94.12.

3.03 STORAGE AND HANDLING

- A. Store all materials on blocking so that no metal touches the ground and water can not collect thereon. Protect from bending under its own weight or superimposed loads.

3.04 SCHEDULES

- A. Anchorage materials to be as noted on plans.
- B. If materials are not noted on plans, the materials shall be:
 1. Below ground: Carbon steel.
 3. Above ground: 316 stainless steel

***** END OF SECTION *****

SECTION 09900 PAINTING AND COATING

PART 1 – GENERAL

1.01 SCOPE

- A. This section governs materials and application of painting and coating for exposed pipe and appurtenances.

1.02 SUBMITTALS

- A. Prior to application, the following shall be submitted:
 - 1. Paint or coating manufacturer's product data sheet showing suitability of material for intended use including instruction on surface preparation and application.

1.03 COLOR SCHEDULE

- A. Above-ground or exposed facilities shall be color coded to differentiate from potable water, reclaimed water, and wastewater facilities as follows:

Potable Water:	Medium Blue
Reclaimed Water:	OSHA Safety
Purple Wastewater:	OSHA Safety
Green	

PART 2 – MATERIALS

2.01 EPOXY ENAMEL COATING

- A. Exterior surface of all steel or ductile-iron service pipe, fittings, couplings and other exterior metal surfaces shall be epoxy enamel coated in accordance with AWWA C210.07
- B. Primer shall be per manufactures recommendation with use of Epoxy Enamel.

2.02 BITUMINOUS MASTIC

- A. Bituminous mastic shall be coal-tar pitch based and shall have a minimum of 68% solids by volume.

2.03 EPOXY PAINT

- A. Epoxy shall be a colored polyamide cured epoxy with not less than 49% solids by volume.
- B. All coatings and pigments to be used on potable water services shall have FDA approval for use with potable water.

PART 3 – EXECUTION

3.01 PROJECT COATINGS

- A. Scope: The following governs specific coating systems to be used in each area of work.
 - 1. Valve Vault (for services only)
 - a. Interior and exterior of pipe and ferrous metal: Epoxy
 - b. Interior and exterior of valves and fittings: Epoxy
 - c. Buried valves: Epoxy
 - 2. Miscellaneous Surfaces
 - a. Exposed electrical boxes and conduit: Urethane
 - b. Exposed piping and valves: Epoxy Enamel

3.02 GENERAL

- A. The requirements for painting and coating ferrous surfaces shall generally conform to the SSPC (Steel Structures Painting Council) and to the manufacturer's recommendations. Application of the paint or coating system shall not be permitted if, in the opinion of the City, the equipment, climate, or safety conditions do meet the above recommendations.
- B. The Contractor shall stir, strain, and keep coating materials at a uniform consistency during application. Each coating shall be applied evenly, free of brush marks, sags, runs and other evidence of poor workmanship. Finished surfaces shall be free from defects and blemishes.
- C. The Contractor shall not use thinners unless permitted by the City. If thinning is allowed, the maximum allowable amount of thinner per gallon of coating material as recommended by the manufacturer shall be used. Coating materials shall be stirred at all times when adding thinner and the coating material surface shall not be flooded with thinner prior to mixing. The Contractor shall not reduce coating materials more than is absolutely necessary to obtain the proper application characteristics and to obtain the specified dry film thickness.
- D. Deliver all paints to the job site in the original, unopened containers.

3.03 SURFACES NOT TO BE COATED

- A. The following surfaces shall not be painted and shall be protected during the painting of adjacent areas:
 - 1. Mortar-coated pipe and fittings
 - 2. Concrete surfaces (i.e. vaults)
 - 3. Stainless steel
 - 4. Anodized aluminum
 - 5. Nameplates
 - 6. Manhole frames and covers
 - 7. Grease fittings
 - 8. Glass
 - 9. Brass, copper or bronze
 - 10. Platform gratings
 - 11. Buried pipe, unless specifically required in the piping specifications

3.04 SURFACE PREPARATION

- A. The Contractor shall not prepare more surface area than can be coated in one day. Pipe that has already been factory primed or painted shall not be

sandblasted. All surfaces shall be prepared in accordance with the manufacturer's recommendations.

- B. Wherever the words "solvent cleaning", "hand tool cleaning", "wire brushing", or "blast cleaning", or similar words are used in these specifications or in paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC (Steel Structure Painting Council).

3.05 SHOP APPLIED PRIMER

- A. Surfaces that are shop primed shall receive a field touchup of primer to cover all scratches or abraded areas.

3.06 BITUMINOUS MASTIC

- A. Buried metal (flanges, non-stainless steel nuts and bolts, flexible couplings, exposed reinforcing steel, etc.) shall be coated with a minimum of 20 mils of bituminous mastic.
- B. All surfaces coated with bituminous mastic shall be covered with 8 mil polyethylene wrap.

3.07 EPOXY COATING

- A. All exposed steel and ductile-iron piping, fitting, and couplings are to have exterior surfaces epoxy enamel coated.
- B. Only those metal surfaces specifically called out, shall be epoxy coated and applied as follows:
 - 1. Surfaces to be epoxy coated shall be sandblasted.
 - 2. Sandblasted surfaces shall be coated with primer to a dry film thickness of 3 mils.
 - 3. Two coats of epoxy paint shall be applied (4 mils each) to the primed surface. The manufacturer's recommended drying time between coats shall be followed.
 - 4. The Contractor shall prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Partial batches and multiple component coatings that have been mixed beyond their pot life shall not be used. Touchup paint shall be provided. The Contractor shall mix only the components specified and furnished by the paint manufacturer. The Contractor shall not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

3.08 APPLICATION LIMITATION

- A. Paint or coating shall not be applied under the following conditions:
 - 1. When the surrounding air temperature or the temperature of the surface to be coated is below 40° F or as recommended by the manufacturer of the specified coating system.
 - 2. When the temperature of the surface to be coated is more than 5° F below the air temperature or when the surface temperature is over 120° F.
 - 3. When the surface to be coated is wet, moist, or contaminated with any foreign matter.

4. During rain, fog, or mist, or when the relative humidity exceeds 80 percent.
5. When the temperature is less than 5° F above the dewpoint.
 - a. If above conditions are prevalent, the application of coating shall be delayed or postponed until conditions are favorable. Dew or moisture condensation should be anticipated and if such conditions are prevalent, coating work shall be delayed until mid-morning to be certain that the surfaces are dry.
 - b. The day's coating shall be completed in time to permit the film sufficient drying time prior to damage by climatic conditions.
 - c. If a change in climatic conditions damages a coating application, the Contractor shall repair the damaged coating to its specified condition as directed by the City.
 - d. Paint shall be applied in such a manner as to assure an even, smooth, uniform adhering coat free from dirt, runs, brush marks and laps, and shall be applied as recommended by the manufacturer. Paint shall not be applied when freshly painted surfaces can become damaged by rain, fog, or condensation or when inclement weather can be anticipated. Fresh paint damaged by the elements shall be replaced by the contractor at his expense. Drop cloths shall be used to protect floors, equipment, piping and other exposed surfaces from spattering and spillage. Paint shall be allowed to dry thoroughly between applications of successive coats. The manufacturer's recommended time between coats will be used as a guide by the City as to when the next coat of paint may be applied. The City must give approval before successive coats are applied.
 - e. The Contractor shall notify the City after surface preparation and after the application of each coat of paint.

PART 4 – TESTING

4.01 GENERAL

- A. The City will perform such tests as are required to ensure compliance with all phases of the work including surface preparation, abrasive blast cleaning, and the application of the coating systems.
 1. If the item has an improper finish color or insufficient film thickness, the surface shall be cleaned and top coated with the specified paint material to obtain the specified color and coverage. Visible areas of chipped, peeled, or abraded paint shall be hand or power-sanded, feathering the edges. The areas shall then be primed and finish coated in accordance with the specifications. Work shall be free of runs, bridges, shiners, laps, or other imperfections.

***** END OF SECTION *****

SECTION 15114
VALVES AND RELATED EQUIPMENT

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Gate valves
 - 2. Air release and vacuum relief valves
 - 3. Automatic control valves:
 - 4. Pressure Gages
 - 5. Water Quality Sampling Station
 - 6. Service Line Materials and Fittings
- B. Related Sections include but are not necessarily limited to:
 - 1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract
 - 2. Division 1 - General Requirements

1.02 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. American Gas Association (AGA)
 - 2. American National Standards Institute (ANSI):
 - a. B16.1, Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
 - 3. American Water Works Association (AWWA):
 - a. C512, Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service
 - b. C530, Pilot Operated Control Valves
 - c. C550, Protective Epoxy Interior Coatings for Valves and Hydrants
 - 4. NSF/ANSI Standard 61: Drinking Water System Components – Health Effects

1.03 SUBMITTALS

- A. Shop Drawings and Operations and Maintenance Manuals:
 - 1. See Division 1 requirements of these specifications.
- B. Prior to the purchase of valves to be used in the City system, the following items shall be submitted and approved by the City:
 - 1. Manufacturer's catalog data showing valve type and size to be used, valve

dimensions, pressure rating and materials of construction.

2. Manufacturer's data and NSF certification seal on the lining to be used.

PART 2 – PRODUCTS

2.01 VALVES GENERAL

- A. All valves shall be NSF 61 Certified. Documentation of the NSF certification shall be provided with the valve submittal.
- B. All valves shall open in the counter clockwise direction. Valves 3-inches and larger shall be equipped with standard 2" nuts unless otherwise shown on the plans. Valves shall have non-rising stems. Valves 3-inches and larger shall be coated with a minimum 10 mils of a fusion applied epoxy coating, 3M Scotchcoat 203, or an approved equivalent. All valves shall be NSF 61 Certified.
- C. Type B and C bronze as defined by AWWA shall not be used in contact with water.
- D. The manufacturer shall supply catalog data including illustrations, assembly drawings, and a part schedule that clearly identifies the type of material used. This information shall be in sufficient detail to serve as a guide for assembly and disassembly, and for ordering parts.
- E. Butterfly valves shall be used in pipelines greater than ten (10) inches in diameter unless otherwise noted on the plans. Gate valves shall be used in pipelines up to and including ten (10) inches in diameter, unless otherwise noted on the plans.
- F. All bolts and nuts shall be Grade 5 or B7 (ASTM 193) Tripac 2000 coated steel, (washers shall be 316 stainless steel). Washers are required at all bolted connections. No equal approved.

2.02 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the manufacturers listed under the specific valve types are acceptable.
- B. Submit requests for substitution in accordance with the Division 1 requirements of these specifications.

2.03 GATE VALVES

- A. Gate valves shall be resilient seated conforming to AWWA Standard C509 with end connections as shown on the drawings. Valve shall be: Epoxy lined and coated; Rating: 200 psi; Type: non-rising stem with operating nut.
- B. Acceptable Manufacturers (Only):
 1. Henry Pratt Company
 2. Mueller Company
 3. Clow

2.04 AIR/VACUUM RELEASE VALVES

- A. General:

1. The air vacuum release valve body and cover shall be constructed of cast or ductile iron. Each valve shall be equipped with ASTM 240 stainless steel float and, unless otherwise indicated on the plans the mechanism shall be 5/16" orifice for venting air when system is pressurized. Each valve shall be equipped with a galvanized gooseneck with a screened end. The entire valve assembly shall have a minimum pressure rating of 150 psi. All hardware shall be stainless steel.
2. Acceptable manufacturers (or Equal):
 - a. APCO (Valve and Primer Company)
 - b. Crispin (Multiplex Manufacturing)
- B. Combination Air Release Valves (Water):
 1. Acceptable manufacturers:
 - a. GA Industries, Figure 980, 1 IN.
 - b. APCO Series 1700, 1 IN.
 - c. Or approved equal.
 2. Materials:
 - a. Body and cover: Cast iron.
 - b. Float, linkage and hardware: Stainless steel.
 - c. Seat: Buna-N.
 3. Design requirements:
 - a. Working pressure: 150 PSI.
 - b. Release 10 CFM at 5 PSI differential at 150 PSI line pressure.
 - c. Unit may be combined in one valve body or be duplex type.
 - d. Provide surge check unit.
 - e. Provide butterfly isolation valve.

2.05 PRESSURE GAGES

- A. Liquid filled glycerin or silicone.
- B. 2-1/2 to 3-1/2 inch dial, scale 20-50% greater than normal operating pressure, 270 degree movement.
- C. Stainless steel case, polycarbonate window, stainless steel bourdon tube and movement.
- D. 2-1/2 percent accuracy.
- E. 1/4-inch NPT bottom connection.
- F. Ashcroft type 1009; Marsh J7800P Series, or approved equal.
- G. 1/4-inch stainless steel cross handle cock, Ashcroft 7004; Marsh MFG, or approved equal.

- H. Ashcroft, Dresser Indust., 250 E. Main, Stafford, CT 06497; Marsh Instrument Co., Skokie, IL 60076 or approved equal.
- I. Each pressure gage installation shall include a dampener and shut off cock.

2.06 OTHER VALVE AND ENCLOSURE REQUIREMENTS

A. ACCESSORIES

- 1. Furnish any accessories required to provide a completely operable valve and enclosure.

B. FABRICATION

- 1. Completely shop assemble all units.
- 2. Provide internal epoxy coating suitable for potable water for all iron body valves in accordance with AWWA C550.

C. SOURCE QUALITY CONTROL

- 1. Shop hydrostatically test to piping system test pressure.

D. MAINTENANCE MATERIALS

- 1. Provide one set of any special tools or wrenches required for operation or maintenance for each type valve and enclosure.

2.07 WATER QUALITY SAMPLING STATION

A. General

- 1. Water quality sampling station to be Koraleen Enterprises, or approved equal. 6-inch aluminum housing only. All above ground hardware shall be stainless steel.
- 2. Service to main to use 1-inch service saddle, 1-inch polyethylene pipe, 1-inch corp stop and 1-inch curb stop.
- 3. Water quality sampling station shall be installed in accordance with the Standard Detail shown in the plans.

2.08 SERVICE LINE MATERIALS AND FITTINGS

- A. Service line materials and fittings include service line pipe, service saddles, service fittings, meter stops, corporation stops, curb stops, and ball valves.
- 1. Polyethylene Tubing (PE) – PE tubing shall be in accordance with AWWA C901 and correspond to Iron Pipe Size (IPS). The tubing shall be marked with the following:

Nominal size
Materials code; ie PE 3406
The word "Tubing" and dimension ratio
AWWA pressure class, ie, PC 160
AWWA designation AWWA C901
Manufacturer's name or trademark
Seal of testing agency

- a. The polyethylene material shall be type "3408" conforming to ASTM D3350. The pressure class shall be a minimum of 200psi.
 - b. Stainless steel liners or inserts shall be used with PE tubing when compression type connections are specified or shown.
2. Service Saddles – Service saddles shall be constructed of bronze, have AWWA iron pipe thread outlet taps, comply with AWWA C-800 "Threads for Underground Service Line Fittings" and have suitable means for attachment and sealing to a water main. The body shall be made to conform to outside configuration of the main. The service saddle shall be designed to provide a drip-tight connection when used as a service connection to the main. Saddles for ductile iron pipe shall be double strap. Straps for PVC pipe may also be stainless and shall provide full support around the circumference of the pipe and have a bearing area of sufficient width so that the pipe will not be distorted when the saddle is tightened.
3. Corporation Stops – Corporation stops shall be constructed of bronze, have AWWA iron pipe inlet threads, and shall comply with the requirements of AWWA C-800, "Threads for Underground Service Line Fittings." Male iron pipe threads shall be provided on the outlet side of 1½-inch and 2-inch corporation stops.
4. Fittings – Fittings including PE tubing couplings, bends, unions, and adapters shall be constructed of bronze and shall be designed to join to CTS polyethylene tubing using a "stab type" connection (Mueller or approved equal) in ¾-inch and 1-inch sizes and compression type connections in 1-1/2 inch and 2-inch sizes. Fittings shall also have male or female iron pipe-size-threaded ends and/or meter coupling nut or meter flange as required.
5. Angle Meter Stops – Angle meter stops shall be constructed of bronze, have lock wings and be suitable for joining to CTS polyethylene using a "stab type" connection for ¾-inch and 1-inch angle meter stops and a compression type connection for 1-1/2 inch and 2-inch angle meter stops. Outlets for ¾-inch and 1-inch angle meter stops shall consist of a meter coupling nut. One-and-a-half inch and 2-inch angle meter stops shall have meter flange outlets.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Air Release, Vacuum Relief, and Pressure Relief Valves:

1. Pipe exhaust to a suitable disposal point.

B. Polyethylene Tubing – Tubing and fittings should be stored in a way that prevents damage due to crushing or piercing, excessive heat, harmful chemicals, or exposure for prolonged periods. The manufacturer's recommendations regarding storage should be followed.

1. Handling operations and trench installation and backfill shall be performed with reasonable care to prevent scratches, nicks, and gouges in the conduit.
 2. Pipe excessively cut or kinked shall not be used.
 3. Bends in PE tubing shall not occur closer than 10 diameters from any fitting or valve. The minimum radius of curvature is 30 diameters or the coil radius when bending with the coil. Bending of coiled tubing against the coil shall not go beyond straight. Polyethylene tubing that becomes kinked during handling or installation shall not be used and care should be taken to ensure that kinking does not develop after installation. Service line from the main line tap to the angle meter stop shall be one continuous length of tubing.
 4. PE tubing shall be installed in trench bottoms with 6-inches of bedding material to provide continuous and uniform support. The initial backfill shall be 6-inches above the tubing and shall be materials free from rock, stones and debris.
 5. All new service line and in-tract piping shall have tracer wire fastened in accordance with the City standards and the plans.
- C. Service Saddles - The service saddle shall be no closer than 18 inches to a valve, coupling, joint, or fitting, unless it is at the end of the main.
1. The surface of the pipe shall be free of all loose material and have a hard, clean surface before placing the service saddle.
 2. The service saddle shall be tightened firmly to ensure a tight seal, however, care shall be used to prevent damage or distortion of either the pipe, corporation stop or service saddle by overtightening.
 3. The drilling of the pipe shall be performed in accordance with the pipe manufacturer's recommendation. Hot tapping of service saddles will not be permitted.
- D. Installation of fittings, stops, and boxes shall be as recommended by the manufacturer. Pipe or fittings made of nonferrous metals (bronze) shall be isolated from ferrous metals with insulating unions or couplings.

3.02 FIELD QUALITY CONTROL

- A. Clean, inspect, and operate valve to ensure all parts are operable and valve seats properly.
- B. Check and adjust valves and accessories in accordance with manufacturer's instructions and place into operation.

**** END OF SECTION ****

SECTION 15220

POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS (GRAVITY SEWER FLOW)

1.0 GENERAL

- 1.1 Scope** - This Section of the specifications will govern the furnishing and installation of PVC pipe material and fittings; including laying, jointing, bedding, testing and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be done in strict accordance with the drawings and other terms and conditions of the contract.

The contractor shall also furnish all equipment, tools, labor and materials required to rearrange sewers, conduits, ducts, pipes, or other structures as may be necessary to provide installation as shown and specified.

All standard specifications, i.e., ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.

The contractor shall be responsible for all material furnished by him and shall replace it at his own expense, should the material be defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all material and labor required to replace defective material discovered prior to final acceptance of the work.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and of integral bell and sleeve reinforced bell sockets shall be free from gouges or other imperfections that might cause leakage.

- 1.2 Storage and Care** - 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 incorporated in the completed project. The interior of all pipe and fittings shall be kept free from dirt and foreign matter at all times.

Pipe shall be stored at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct sunlight for more than 14 days, pipe must be covered with an opaque material while permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation.

Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease. Solvent cement when used shall be stored in tightly sealed containers away from excessive heat.

- 1.3 Submittals** - Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

1. Pipe and jointing material
2. Fittings
3. Specialties

2.0 MATERIALS

2.1 Polyvinyl Chloride Pipe (PVC) and Fittings - PVC pipe and fittings shall be made in accordance to ASTM D-3034 or ASTM F679, and ASTM D1784 in both physical, dimensional and chemical requirements. Pipe shall be green unless otherwise approved.

- A. Markings - Each standard or random length of pipe shall be clearly marked with the following:
- Manufacturer's name
 - Nominal pipe size, i.e. six-inch
 - Cell classification or material code; i.e. 12454-B
 - Dimension ratio; i.e. SDR35
 - Product type; i.e. Type PSM
 - Standard specification designation; i.e. 03034
 - Production code
- B. Pipe Class - The SDR or wall thickness shall be as shown on the plans.
- C. Laying Length - The standard laying length shall be 20 feet (plus/minus) 1 inch. A maximum of 15% may be furnished in random lengths of not less than 10 feet each.
- D. Joint Type - Pipe joints shall be constructed with an integral bell and spigot with an elastomeric gasket push-on-type joint. Each spigot shall have a reference mark to facilitate pipe assembly. The gasket shall be contained in a machined groove on the pipe spigot such that when compressed the gasket will not displace and will form a positive seal. The gasket shall meet all requirements of ASTM F-477; pipe lubricant shall be listed with NSF (National Sanitation Foundation).
- Solvent cement joints are strictly prohibited.
- E. Physical Test Requirements -
1. Material - Material samples shall be taken at the beginning of production and tested for compliance to ASTM D-3034 or ASTM F794.
 2. Product Quality - The following tests shall be performed on a sample of pipe.

Flattening - Three specimens of pipe per pipe size furnished, minimum of six inches long, shall be flattened between parallel plates in a suitable press until the distance between the plates is 40% of the outside diameter of the pipe. The rate of loading shall be uniform and such that the compression is completed within two to five minutes. Remove the load, and examine the specimens for splitting, cracking, or breaking.

Pipe Stiffness - The pipe stiffness shall be determined utilizing procedures similar to those outlined in ASTM D2412. The stiffness of pipe shall be determined at a 5% deflection datum. Test specimens shall be a minimum of two pipe diameters or four feet in length, whichever is less.

Joint Tightness - Joint tightness shall be tested in accordance with ASTM D3212.

The manufacturer shall provide a certificate of conformance for the above tests. Tests shall be performed on materials and products from the same lot of those furnished to the project.

Plant Inspection - The District may require inspection of production of the pipe. When requested, the manufacturer shall provide advance notice of when and where production of materials will begin.

- F. Struts - All pipe, 24 inches in diameter and greater, shall be strutted prior to placement in the trench. Each strut shall consist of two 2x4's placed in a perpendicular cross. A minimum of four struts equally spaced shall be placed per pipe length. Struts are to be removed prior to backfill above the pipe zone.

2.2 Warning Tape - Warning tape shall be two-inch wide green non-metallic tape marked "sewerline."

2.3 Fittings - All fittings shall be as manufactured and furnished by the pipe supplier or approved equal and have bell and/or spigot configurations compatible with the pipe.

3.0 EXECUTION

3.1 Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

- A. **Rubber Gasket Storage** - Store all rubber gaskets in a cool, well ventilated place and do not expose to the direct rays of the sun. Do not allow contact with oils, fuels, petroleum, or solvents.

3.2 Pipe Laying -

- A. **General** - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein.
- B. **Cleanliness** - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.

Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.

Groundwater shall not be allowed to enter the pipe.

- C. **Inspection Before Installation** - All pipe and fittings shall be carefully examined for cracks and other defects while suspended and before installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the District, who will prescribe corrective repairs or rejection.
- D. **Lowering of Pipe Material into Trench** - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the contractor, for the safe and convenient performance of the work. All pipe shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the materials. Under no circumstances shall the pipe be dropped or dumped into the trench.

If damage occurs to any pipe or accessories in handling, the damage shall be immediately brought to the District's attention.

- E. **Laying of Pipe** - Pipe laying shall proceed upgrade with spigot ends pointing in the direction of flow. After a section of pipe has been lowered into the prepared trench, the contractor shall clean the end of the pipe to be joined, the inside of the joint, and the rubber ring immediately before joining the pipe. The assembly of the joint shall be made in accordance with the recommendations of the manufacturer of the type of joint used. The bell and spigot joint shall be pushed "home" in line with the installation band. If a piece has been cut, the usable end shall be clearly marked to show the proper amount of installation distance. All special tools and appliances required for jointing assembly shall be provided by the contractor.

After the joint has been made, the contractor shall check pipe for alignment and grade. The trench bottom shall form a continuous and uniform bearing and

support along the length of the pipe between joints. Sufficient pressure in making the joint shall be applied to assure proper pipe alignment and joint makeup. Sufficient pipe zone material shall be placed to secure the pipe and prevent movement before the next joint is installed.

When pipe is laid within a movable trench shield, all necessary precautions shall be taken to prevent pipe joints from pulling apart when moving the shield ahead.

Precautions shall be taken to prevent excavated or other foreign material from getting into the pipe during the laying operation. At all times, when laying operations are not in progress, or whenever the workers are absent from the job, the contractor shall close and block the open end of the last laid section of pipe to prevent entry of foreign material or creep of the gasketed joints.

Pipes which are stubbed off for manhole construction or for connection by others shall be plugged or closed off with temporary plugs as specified in the manhole specifications.

The contractor shall take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.

Where pipe is connected to manholes or concrete structures without using a flexible connector, connections shall be made so that the standard pipe joint is located not more than 2 feet from the outside edge of the structure unless otherwise shown.

- F. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for fittings or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe. The pipe shall be marked around its entire circumference prior to cutting to assure a square cut. A factory finished beveled end shall be used as a guide for proper bevel angle and depth of bevel plus the distance to the insertion reference mark. The end shall be beveled using manufacturer recommendations. Sharp edges on the leading edge of the bevel shall be rounded off with a pocket knife or a file.

3.3 LEAKAGE TESTING -

Refer to the El Dorado Irrigation District Standard Specification 33 01 30.13 for leakage testing procedures and requirements found in Appendix D of the project spec.

END OF SECTION

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SECTION 33050
SEWER BYPASSING AND DEWATERING

PART 1 - GENERAL

1.01 SUMMARY

This section describes the existing conditions for temporary bypassing and dewatering of sewers during internal television inspection (CCTV), cleaning operations, rehabilitation, and inspection of the project pipelines and of service laterals during the rehabilitation prior to reconnection to the rehabilitated pipeline.

1.01 REQUIREMENTS

- A. Contractor shall provide labor, materials, and supervision to temporarily bypass flow around the Contractor's work in accordance with the specific needs of the rehabilitation method being utilized and dewater the pipelines in preparation for cleaning and rehabilitation. All references to the bypass pumping and/or bypass pumping system include, but are not limited to, all pumps, piping, valves and other equipment needed to move the intended flow from one location to another.
- B. The actual design of the bypass arrangement and alignment shall be prepared by the Contractor, and shall be submitted to the Engineer to determine conformance to project objectives. Means and methods of accomplishing the bypassing shall be the responsibility of the Contractor.
- C. Sanitary sewer mains shall remain in service at all times throughout the duration of the project. Contractor shall be responsible for diverting flow away from the limits of construction through the use of bypass pumping or flow diversions with prior written approval by the Engineer.
- D. Service to laterals shall be disrupted for a period of no more than 4 hours. Laterals shall only be out of service between the hours of 12:00 am and 8:00 am, Sunday through Thursday. Laterals within business areas shall be addressed on a case by case basis. If Contractor feels that it is necessary to disrupt lateral services for a period longer than 4 hours, Contractor shall provide alternate means of service without disrupting use of the service by the owner/resident.
- E. Contractor shall maintain pedestrian and vehicular traffic and comply with ADA regulations for access to all residential and commercial property unless written approval is otherwise obtained from the City allowing for reduced access.
- F. It is the Contractor's responsibility to arrange all necessary access and temporary construction agreements with all affected parties for the location of the bypass pumping system.
- G. The bypass pumping system shall be designed to normally maintain the wastewater flow below the top of the pipe, without surcharging.
- H. The Contractor shall have the complete bypassing system in place and successfully pressure tested at 1.5 times the maximum operating pressure of the system before bypassing any sewage.

- I. The Contractor shall notify the Engineer 48 hours prior to shutting down or bypassing the pipeline.
- J. The bypassed flow shall be continuously monitored.
- K. Contractor is responsible for immediate and proper cleanup should any spill occur, regardless of amount.
- L. Contractor to adhere to City's noise regulations in accordance with Specification Section 01360 – Environmental Controls.

1.02 EXPERIENCE

Contractor shall utilize staff and/or a subcontractor that has been directly responsible for completion of a CIPP project that required the bypass pumping of sewage flows in excess of 0.30 MGD.

1.03 SUBMITTALS

- A. At the Preconstruction Conference the Contractor shall submit, in accordance with Specification Section 01330 – Submittal Procedure, drawings and complete design data showing methods and equipment he proposes to utilize in sewer bypassing for approval by the Engineer. The submittal shall include the following information:
 - 1. Drawings indicating the scheme and location of temporary sewer plugs and bypass discharge lines. The drawings shall also show the method and location for discharging the bypass lines.
 - 2. Capacities of pumps, prime movers, and standby equipment.
 - 3. Design calculations proving adequacy of the system and selected equipment.
 - 4. Standby power source.
 - 5. Staffing Plan.
 - 6. Show suction and discharge points with elevations & stationing on the design plans.
 - 7. Provide pump performance curves.
 - 8. Submit calculations to verify suction lift of pumps has not been exceeded.
 - 9. Contractor shall submit proposed noise control and exhaust control plans for pumping equipment.
 - 10. Contractor shall submit a proposed plan for disruption of sewer service laterals.
 - 11. Contractor shall submit bypass piping inspection plan.
- B. The actual design of the bypass arrangement shall be prepared by the Contractor or Subcontractor performing the work, and shall be submitted to the Engineer to determine conformance to project objectives. The Contractor shall be responsible for any Subcontractors design (if used) on this Project. Means and methods of accomplishing the bypassing shall be the responsibility of the Contractor.
- C. Approval of submitted plans for sewer connection and temporary rerouting shall in no way relieve the Contractor of their responsibility for the protection of adjacent properties, downstream drainage systems and water tributaries against sewage spill.

Any litigation, claims, fines, etc. associated with any sewage spill shall be the responsibility of the Contractor.

1.04 JOB CONDITIONS

- A. Available Flow Data
 - 1. Available flow data for the sewers to be rehabilitated at the project site is located in 1.02 - Experience of this section. Flow data for the service laterals is not available. The Contractor shall determine the flow in the service laterals.
- B. Protection
 - 1. In areas where flows are bypassed, all bypass flows shall be discharged as approved by the Engineer. No bypassing to the ground surface, receiving waters, storm drains, or bypassing which results in soil or groundwater contamination or any potential health hazards shall be permitted.
- C. Scheduling
 - 1. The bypassing system shall not be shut down between shifts, on holidays or weekends, or during work stoppages without written permission from the Engineer. The bypass system will have an attendant around the clock whose only duty is to maintain the bypass pumping system until the bypassing of that specific pipeline is no longer required.

1.05 MATERIALS

- A. Pumping Systems
 - 1. Contractor shall maintain on site, the following minimum requirements for all bypass pumping systems:
 - a. Sufficient equipment and materials to ensure continuous and successful operation of the bypass and dewatering systems. The COMPLETE bypass system, including all piping, shall be continuously monitored by Contractor personnel.
 - b. A system of pumps and piping operating on site to maintain a minimum 50% over capacity of the anticipated maximum flow (as determined by the Contractor). In addition, the Contractor shall have a standby pump, equal in capacity to the largest pump in the system, piped, plumbed and ready for operation. Standby pumps shall be fueled and operational at all times.
 - c. The Contractor shall maintain on site a sufficient number of valves, tees, elbows, connections, tools, sewer plugs, piping, hoses and other parts of system hardware to ensure immediate repair or modification of any part of the system as necessary.

1.06 CONSTRUCTION

- A. Estimated Flows and Sewer Capacity Project Pipeline

1. Daily Flow Data
 - a. The following paragraph provides observed daily flow information for the project pipeline. The information was obtained from the data provided by the City. For additional information contact the City, during normal business hours. Use of this flow data in no way relieves the Contractor from his responsibilities for design, construction and operation of an adequate and properly functioning bypass system. Any additional monitoring or gathering of flow data is the responsibility of the Contractor.
 - b. The City defines the design level of service for peak wet weather flows (PWWF) as the average dry weather flow multiplied by a flow factor of 4 per EID Design Standard Section 3.2 – Design Flows, Hydraulics, and Sizes. The PWWF in the sewer ranges from 0.05 million gallons per day (MGD) to 0.30 MGD.
2. Flow Conditions
 - a. The Contractor is responsible for obtaining current flow condition information at the time of construction. The Owner is not responsible for any deviations in quantity of sewage flow at any time during the construction period. Higher flows may be encountered depending on weather and other upstream condition.
3. Inspection
 - a. The Contractor shall continuously monitor the entire bypass pumping and piping system for leaks and spills. The Contractor shall also create an inspection log and shall enter the time of the inspections and the condition of the piping and the name of the inspector into the log for review by the Engineer.
4. Damages
 - a. The Contractor shall repair, without cost to the owner, any damage that may result from his negligence, inadequate or improper installation, maintenance and operation of bypassing system, including mechanical or electrical failures.

1.07 PAYMENT

There is no specific pay item for sewer bypassing and dewatering. The work is included in pay Item No.'s 28, 29, 30, 31, 32, 34.

**SECTION 33311
CURED-IN-PLACE PIPE (CIPP)**

PART 1 - GENERAL

1.01 Summary

- A. This section covers materials for CIPP lining of existing sewers. This work shall consist of all labor, equipment and materials necessary to install CIPP. The Contractor shall be responsible for control of all materials and process variables to provide a finished CIPP possessing the minimum properties specified in ASTM F1216 and supplemented herein.
- B. Contractor shall provide equipment, planning, and job execution necessary to accomplish the work in an efficient manner and consistent with the objectives of this Specification, including preventing damage to existing infrastructure and maintaining pedestrian and vehicle access during construction. All equipment (engines, pumps, boilers) shall be equipped with mufflers and/or plywood/Styrofoam noise panels enclosing equipment to keep the noise level with limits specified in Section 01360 – Environmental Controls.
- C. Contractor shall determine location of and inspect all inversion manholes for any obstruction that may interfere with the liner installation prior to ordering felt tube and shall make any necessary improvements to manhole to allow for insertion at no additional cost to the City.
- D. Prior to commencement of CIPP lining, Contractor shall install bypass pumping and thoroughly clean sanitary sewers per Section 33050 – Sewer Bypassing and Dewatering, and CCTV sanitary sewers per these Special Provisions and the Standard Specifications.
- E. Contractor shall measure and verify in the field, the diameter and length of the pipe to be lined prior to ordering felt tubing. The Engineer has made a diligent effort to determine pipe diameters at each installation location. The Contractor acknowledges that the contract documents are not guaranteed to be entirely accurate and it is Contractor's responsibility to verify diameters and notify the Engineer immediately if discrepancies are discovered. Contractor shall not "Wet Out" any CIPP liner prior to verifying diameters at the locations where it is to be installed.
- F. When cutting or trimming the installed CIPP liner, the Contractor shall remove all loose pieces of CIPP from the sewer as outlined in Section 33311- 3.01A of this Specification. Nets and/or screening shall be installed to prevent even small pieces of removed CIPP material from washing downstream.

1.02 REFERENCES

This section contains references to the following documents. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM D2990	Test Method for Tensile, Compressive and Flexural Creep and Creep-Rupture of Plastics
ASTM D543	Test Method for Resistance of Plastics to Chemical Reagents
ASTM D638	Test Method for Tensile Properties of Plastics
ASTM 790	Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D883	Definitions and Terms Relating to Plastics
ASTM D1600	Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
ASTM D2122	Definitions of Terms Relating to Plastic Piping Systems
ASTM F412	Definitions of Terms Relating to Plastic Piping Systems
ASTM F1216	Rehabilitation of Existing Pipelines and Conduits by Inversion and Curing of a Resin Impregnated Tube

1.03 QUALITY ASSURANCE

Contractor shall provide equipment, planning, and job execution necessary to accomplish the work in an efficient manner and consistent with the objectives of this Specification.

Contractor will be required to take measures to limit styrene discharges to the collection system at all times. If requested by the engineer, a detailed plan for reducing the styrene concentrations in all discharged process water shall be submitted for review prior to performing any lining work. At no time shall the concentration of styrene exceed 2 mg/l in any water discharged to the sewer system. Contractor shall maintain an ongoing sampling program and provided complete laboratory analysis for styrene on all samples collected along with completed chain-of-custody forms. Analytical results demonstrating compliance with this requirement must be provided within 24 hours following each installation AND prior to the discharge of any additional process water.

1.04 SUBMITTALS

A. The following submittals shall be provided in accordance with Section 01330 – Submittal Procedure of these Specifications:

1. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (☐) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each

deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Engineer or his designated representative shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

2. Shop drawings which detail short and long term properties (providing all supporting test data) of all component materials and construction.
3. Recommendations for material storage and temperature control, CIPP liner handling, insertion, curing (installation processes, curing speeds, pressures, temperatures), trimming and finishing.
4. Structural calculations for each reach of pipeline to be rehabilitated using CIPP methods. The resin type, depth and size of pipe, design thicknesses, and install thickness shall be provided.
5. The method and equipment to be used to reinstate sewer connections, laterals, and inside drops.
6. List of identified insertion manholes and inspection logs for each manhole.
7. Detailed method for addressing field sampling requirements, including location and size of each sample, method of removal, and method of liner repair.
8. Detailed method for addressing resin and catalyst mixing, sampling and quality assurance testing requirements during the wet-out process.
9. A sample of a CCTV Inspection report.
10. Manufacturer's recommended installation procedures.
11. Contractor shall submit 10,000-hour third party, 50-year Flexural Creep Modulus test data. Test shall be in accordance with ASTM D-2990 at 10,000 hours or equal test as approved by the Engineer. If approved 10,000 hour tests are not available, Contractor shall use a minimum 50% reduction (50% retention) of Flexural Modulus of Elasticity (per ASTM F-1216) for all formula calculations.
12. Certification showing the Contractor is currently licensed by the appropriate licenser to perform CIPP installation. Certification shall be given to the Engineer before any materials are delivered to the job site.
13. Certification stating CIPP tube has been manufactured in accordance with ASTM F1216 and resin is suitable for its intended use.
14. Test report of CIPP sample(s) and tests as specified in Subsections 33311 - 1.04A and 3.01G of these Specifications. Testing for chemical resistance shall be performed on a previously prepared sample of the finished product, proposed for this project. A certified affidavit, signed by an officer of the company, shall be provided stating that the resin the test applies to and the resin submitted for this project are the same.

15. Certification that the independent testing laboratory utilized by the Contractor is accredited to perform the testing as required in Subsection 33311 - 1.04A(1).
16. Detailed information on hydrophilic end seal gaskets to be used at each end of the liner and epoxy material to be used to fully seal the liner ends at each manhole.
17. Warranty Information
18. Material safety data sheets for all hazardous chemicals used or expected to be on-site. At a minimum, sheets for the resin, catalyst, cleaners and repair agents should be submitted. Contractor shall have two (2) copies of MSDS Sheets on site during construction.
19. Detailed procedures for dealing with styrene release to the downstream sewer. Procedure should describe methods that will be taken to limit styrene discharges to less than 2 mg/l for all water discharged into the sewer. Plan shall also provide details for the water sampling methods and analytical analysis procedures to demonstrate compliance with this requirement. Provide a copy of all completed discharged permits required to discharge process water to the sanitary sewer system.
20. Original copy of all laboratory analysis reports for all samples collected during the discharge monitoring for styrene shall be submitted. It is understood that this item will require ongoing submittals.
21. A set of drawings identifying location of all fire hydrants the Contractor intends to use.
22. Original and one (1) copy of all laboratory analysis reports for all CIPP samples collected for each liner tube installed shall be submitted. It is understood that this item will require ongoing submittals.
23. A final CCTV inspection video. The final inspection video must verify the finished product is free of unnecessary voids and wrinkles and all services have been properly reestablished. The final inspection video must also verify that the finished product complies with all other requirements in the standard specifications and special provisions.

B. Chemical Resistance

The chemical resistance tests should be completed in accordance with Test Method D 543. Exposure should be for a minimum of one month at 73.4 degrees F. During this period, the CIPP test specimens should lose no more than 20 percent of their initial flexural strength and flexural modulus when tested in accordance with Section 8 of ASTM F1216 when subjected to the following solutions:

Chemical Solution	Concentration, percent
Tap Water (pH 6-9)	100
Nitric Acid	5
Phosphoric Acid	10
Sulfuric Acid	10

Gasoline	100
Vegetable Oil	0.1
Detergent	0.1
Soap	0.1

The Contractor shall be responsible for all costs associated with the chemical resistance tests.

Proof of meeting these requirements shall be provided to the Engineer for approval at the preconstruction meeting.

PART 2 – MATERIALS

2.01 CURED-IN-PLACE PIPE (CIPP)

CIPP shall be a resin impregnated needled polyester felt non-woven material tube with a plastic coated wearing surface in all sewers identified for CIPP lining in accordance with American Society for Testing and Materials (ASTM) F-1216. All materials and installation procedures provided by the Contractor for use in the CIPP installation process shall be equal to or exceed the requirements of Sections 5 and 7 of ASTM F-1216.

2.02 COMPONENT PROPERTIES

A. Flexible Tubing

1. The tube shall consist of one or more layers of absorbent non-woven felt fabric that meets the requirements of ASTM F1216. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that may cause delamination in the CIPP. Non-woven felt tubes shall have a flexible polyurethane or polypropylene membrane coating to contain the resin. The seam of the flexible tube shall be sewn; seams that are heat-bonded or otherwise joined that prohibit complete impregnation with resin will not be allowed.

B. Resins

1. The physical properties quoted in Subsection 33311 - 2.02C apply to cured CIPP manufactured polyester, vinyl ester, and epoxy resin. Resins shall be tinted for visibility and provide positive indication of adequate liner wet-out. Resins should be appropriate for conditions encountered.

C. Finished and Cured CIPP Liner Properties

1. The physical properties of the cured CIPP shall have minimum initial test values as given in Table 1 of ASTM F1216 (and supplemented below in Table 1) for polyester, vinyl ester, and epoxy resins. Properties for these or any other enhanced resins shall be substantiated with test data. Resins shall be tinted for visibility and provide positive indication of adequate liner wet-out. Liner thickness shall meet or exceed the submitted thickness for each reach.

Table 1: Standard Resin

Test Property	Test Value	Test Method
Flexural strength	4,500 psi	ASTM D790
Flexural modulus	300,000 psi	ASTM D790
50-year flexural creep modulus	150,000 psi	ASTM D2990
Installed liner thickness	Varies	ASTM D5813-04

D. Design Criteria

1. The liner shall be designed in accordance with the procedures of ASTM F 1216, the project plans and these specifications. All material properties used in design calculations shall be long-term (timecorrected) values. All liner pipe used to line the existing sewer shall be designed to have a minimum service life of 50 years and to withstand the total vertical and lateral loads, including, but not limited to, soil load, live loads and hydrostatic loads.
2. Contractor shall calculate the required minimum thickness for each pipe based on a fully deteriorated pipeline condition. Actual level of deterioration may vary within any given section of sewer.

The following parameters shall be assumed for the liner design:

- Modulus of soil reaction, E's = 1000 psi for fully deteriorated pipes.
 - Unit weight of soil = 140 pcf.
 - The minimum design ovality for straight runs shall be 2.0 percent.
 - Factor of Safety = 2.0.
 - Fully Deteriorated Gravity Pipe (Required) for all Projects.
 - Groundwater is assumed to be at surface elevation
 - Flood water where noted.
 - AASHTO H-20 loads
 - AREMA E-80 loads
3. If it is recognized that there is a non-uniform cross-section and the requirement of liner bifurcation is present on the springline of pipelines, the Contractor can design for the bifurcation or provide structural repair which eliminates the pronounced benches. A design for the bifurcation or structural repair shall be required for any bench in the proximity of the springline greater than 2- inches in depth. Accounting for this condition by the use of an ovality reduction factor alone is not acceptable. Calculations for the design of the bifurcation condition or statement of intent to apply grout shall be submitted to the Engineer 3 days after the date of contract award.
 4. The wall thickness of the felt tube shall be ordered to the next standard 1.5 mm incremental thickness above the minimum calculated design thickness. Unless otherwise specified to provide for excess resin migration, the gap thickness of the

wetting out equipment shall be sized to allow an excess of 5 to 10 percent resin to pass during impregnation. The minimum wall thickness shall be determined at a minimum of three locations on a cut section of the CIPP lining using a method of measurement accurate to the nearest 0.005 inch. The minimum value shall exceed the requirements of Subsection 33311 - 2.02E of these Specifications. Thickness measurements shall be provided along with other required third party testing.

E. Dimensions

1. The Contractor shall field verify the diameter of the existing pipe prior to ordering the felt tube. Contractor shall make allowances in determining the felt tube length and circumference for stretch during installation and shrinkage during curing. The minimum length shall be that which continuously spans the distance from the center of the inlet manhole to the center of the outlet manhole. The Contractor shall verify the lengths in the field before the felt tube is cut and impregnated. Individual installation runs may include one or more manhole-to-manhole sections as approved by the Engineer.
2. The diameter of the existing pipes may be larger than the nominal inside diameter due to corrosion and/or erosion. It is the Contractor's responsibility to determine the required diameter of the liner.
3. The nominal wall thickness shall be at least the calculated design thickness, or the minimum specified, and may be up to 15 percent greater except where felt layers overlap, in which case it may be in excess of this value.

PART 3 – EXECUTION

3.01 CONSTRUCTION

A. Installation Responsibilities for Incidental Items

1. It shall be the responsibility of the City to locate and designate all manhole access points open and accessible for the work. The manhole access points are shown on the project plans.
2. Cleaning of Sewer Lines - The Contractor shall remove and dispose all internal debris out of the sewer line that will interfere with the installation of CIPP. Solid debris and deposits shall be removed from the system and disposed of properly by the Contractor. Moving material from manhole section to manhole section shall not be allowed. As applicable the contractor shall either plug or install a flow bypass pumping system to properly clean the pipe lines. Precaution shall be taken, by the Contractor in the use of cleaning equipment to avoid damage to the existing pipe. The repair of any damage, caused by the cleaning equipment, shall be the responsibility of the Contractor.
3. Bypassing Sewage - The Contractor shall provide for the flow of sewage around the section or sections of pipe designated for repair. Plugging the line at an existing upstream manhole and pumping the flow into a downstream manhole or adjacent system shall make the bypass. The pump(s) and bypass line(s) shall

be of adequate capacity to accommodate the sewage flow and shall have a redundant back-up system in case of failure. The Contractor shall submit a detail of the bypass plan prior to beginning work.

4. Inspection of Pipelines - Inspection of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles and service connections using close circuit television (CCTV) inspection techniques. The pipeline interior shall be carefully inspected to determine the location of any conditions that may prevent proper installation of CIPP. These shall be noted and corrected. A DVD and suitable written log for each line section shall be produced for later reference by the Owner.
5. Line Obstructions - It shall be the responsibility of the Contractor to clear the line of obstructions such as solids and roots that will prevent the insertion of CIPP. If pre-installation inspection reveals an obstruction such as a protruding service connection, dropped joint, or a collapse that will prevent the installation process, that was not evident on the pre-bid CCTV video and it cannot be removed by conventional sewer cleaning equipment, then the Contractor shall make a point repair excavation to uncover and remove or repair the obstruction. Such excavation shall be approved in writing by the City's representative prior to the commencement of the work. If required, this work shall be completed by force account or agreed price. The pre-bid CCTV video is not available for this project.
6. Public Notification -The Contractor shall make every effort to maintain sewer service usage throughout the duration of the project. In the event that a connection will be out of service, the longest period of no service shall be 4 hours. A public notification program shall be implemented, and shall as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer may be off-line. The Contractor shall also provide the following:
 - a. Written notice to be delivered to each home or business the day prior to the beginning of work being conducted on the section, and a local telephone number of the City they can call to discuss the project or any potential problems.
 - b. Personal contact with any home or business, which cannot be reconnected within the time stated in the written notice.
7. The Contractor shall be responsible for confirming the locations of all branch service lateral connections before beginning the installation of the CIPP.

B. Installation

1. Contractor shall install CIPP liner using the inversion method in accordance with ASTM F1216. For pipe diameters greater than 18-inches only water inversion/water cure is allowed. For pipe diameter equal to or less than 18-inches water inversion/water cure or air inversion/steam cure will be allowed.
2. If infiltration is observed in the pipe to be lined during the post cleaning inspection the Contractor shall inject grout to stop the infiltration prior to

installation of the CIPP. Contractor shall also install a hydrophilic waterstop in each manhole along the shot length. The hydrophilic waterstop end seals shall be bands that are 20 mm wide and 5 mm high, with a double bump on one side and flat on the other as manufactured by Hydrotite, Style DS-0520-3.51 or approved equal, and shall be installed at both ends of the liner in each manhole. The waterstop should be installed such that expansion occurs after installation and curing of the CIPP liner. Adhesive used to bond hydrophilic waterstop to the pipe and any spliced joints shall be as recommended and approved by the manufacture of the waterstop. There will be no additional cost to the City for the grouting or the installation of the hydrophilic waterstop.

3. The curing process shall follow a step cure or similar approach recommended by the liner and resin manufacturer and approved by the engineer and shall be held at the top step for an adequate length of time and temperature to ensure that the design physical properties are attained. Circulation water and/or air shall be cooled to at least 100 degrees F for one (1) hour before releasing the hydrostatic head. The rate of temperature rise and fall during heating and cooling shall not exceed 2 degrees F per minute. The Contractor shall abide by all requirements of the Temporary Discharge Environmental Control Permit required for the discharge of process water as a result of the lining activities.
4. After the curing is complete, existing service connections shall be re-established. Miscellaneous pipe voids and pipe knockouts without an active service connection shall not be re-established.
5. The opening in the liner for the lateral connection shall be one hundred percent of the existing lateral opening. All cut edges at the reinstated laterals shall be smooth and free of jagged edges.
6. The contractor shall seal the end points of the liner at each manhole with epoxy so that no leakage of fluids may infiltrate between the liner and the existing pipe. This seal is in addition to any hydrophilic waterstop that may be installed and shall provide a smooth transition between the manhole and the installed liner completely around the pipe (360 degrees).

C. Permits

1. The Contractor shall be responsible for the application process and fees associated with obtaining all permits required for the commencement and execution of the project, including but not limited to, work within any street right of way, storm water pollution prevention, discharge of construction water into the local drainage system, right-of-entry, excavation and trench safety. Any work performed within the City right-of-way will require encroachment permits. The Contractor shall obtain a no-fee encroachment permit from the City.
2. The Contractor must obtain a water use permit from the City for construction water. Construction meters require a one-thousand dollar (\$1,025) deposit.

D. CIPP Liner and Handling

1. Contractor shall exercise adequate care during transportation, handling and installation to ensure the CIPP material is not torn, cut, or otherwise damaged. If any part or parts of the CIPP material becomes torn, cut or otherwise damaged before or during insertion, it shall be repaired or replaced in accordance with the manufacturer's recommendations and approved by the Engineer before proceeding further; and at the Contractor's expense.
2. Each liner tube shall be labeled by the liner manufacturer with the name of the Contractor, the name of the project, resin type, date "wetout", diameter of the liner, liner thickness, liner length, and the location (manhole number) where it is to be installed.

E. Inspection

1. The Engineer, while not acting as quality control agent for the Contractor, shall be allowed to view and document any portion of this contract, including but not limited to verifying type and quantities of resin used at any point during this work.

F. Finished Product

1. The finished product shall be continuous over the length of pipe reconstructed and be free from dry spots, delamination, and lifts. If these conditions are present, the Contractor shall remove and replace the CIPP. The Contractor shall install the liner to provide a smooth interior surface that is wrinkle free. If wrinkles are detected in the installed liner, the Contractor shall provide photographs and dimensions of the wrinkle including height, length, and direction. Wrinkles in the finished liner pipe which cause a backwater greater than one (1) inch, or reduce the hydraulic capacity of the pipe as determined by the Engineer are unacceptable and shall be removed or repaired by the Contractor at no additional cost to the City. Wrinkles in the finished liner pipe that reduce the structural stability of the pipe are unacceptable (defined as 5% of the host pipe inside diameter as the maximum height of a wrinkle or a backwater/ponding of flow greater than ½ inch). If a void between the wrinkle and the pipe exists, the Contractor shall repair or replace that section of the pipe at no additional cost to the City. Methods of repair shall be proposed by the Contractor and submitted to the Engineer for review.
2. There shall be no leakage of water between the liner and the host pipe following installation. If leakage is present, it shall be the contractor's responsibility to take corrective measures to stop all flow prior to acceptance of the lining work. There will be no additional cost to the City for any sealing activities.
3. All terminations at the entrance/exit for each manhole shall be sealed with a resin mixture that is recommended by the liner manufacturer. The sealing mixture shall be compatible with the liner/resin system, shall provide a watertight seal, and shall be approved by the Engineer prior to start of construction. Hydraulic cements and quick-set cement products are not acceptable. Acceptable materials shall be approved epoxy type products that will bond, not crack, dry up, slough off, or shrink over time, and provide a smooth transition at

the manhole invert and sidewalls. There will be no additional cost to the City for the sealing activities.

G. CIPP Liner Sampling

SAMPLE PREPARATION: The Contractor shall prepare samples of the installed CIPP liner for subsequent testing of its physical properties. For pipelines up to 18-inches in diameter, the Contractor shall provide restrained samples of the installation by lining through a short piece of pipe of the same diameter of the existing sewer. The short piece of pipe shall be held in place by a suitable heat sink, such as sand bags. The sample shall be obtained from either or both ends of the CIPP section so a representative sample of the CIPP lining installed is provided for each reach. Each sample shall be cut in half and each half shall be signed and dated by both the Contractor and the Project Inspector. All CIPP samples shall be properly marked with the date of inversion or insertion and the inversion or insertion number. The Contractor shall retain one signed sample and provide the other signed sample to the testing facility approved as part of the submittal process.

Samples for pipelines larger than 18-inches in diameter shall be prepared and tested using the flat plate sampling method in accordance with the procedures in Section 8.1 of ASTM F1216. The sample will be constructed of the same materials (tube and resin/catalyst) as is used for that given liner installation. The flat plate sample shall be large enough to provide five sample specimens each for Short Term Flexural (Bending) properties and Tensile properties, as per ASTM D790 and ASTM D638 respectively. The sample will be clamped in a mold and placed in the downtube during the curing period of the CIPP tube. The samples shall be removed after all the water is removed from the cured pipe tube. The samples shall be identified by: Date, Project Name, Shot Number, Install Manhole, Size, thickness, Resin and Catalyst.

SAMPLE TESTING: The cured sample shall be tested by an independent testing laboratory, as recommended by the CIPP liner manufacturer and approved by the Engineer, for the bending and tensile properties, as per ASTM D790 and ASTM D638 respectively and liner thickness per ASTM D 2122. Final payment will not be made until test results are received. The Contractor shall be responsible for any deviation from the specified physical properties and those evaluated through testing. Failure to meet the specified physical properties will result in the CIPP liner being considered defective work. The Contractor shall be responsible for all costs associated with the testing of the liner physical properties.

Finished and cured CIPP liner properties specified in Section 2.02C of these Specifications shall be tested as specified. Previous test data will not be acceptable.

SAMPLING FREQUENCY: The above-stated sampling shall be performed for each separate installation of CIPP and each thickness calculated for reaches with tapered tubes. Example: one sample from each individual pipeline liner installed as a minimum and two or more samples where the individual liner is tapered to handle different loading conditions (railroad, high ground water).

H. WARRANTY

1. All lining work shall be fully guaranteed by the Contractor for a period of 2 years from the date of Substantial Completion, unless otherwise stipulated in writing by the City prior to the date of Substantial Completion. During this period, all defects discovered by the City or the Engineer shall be removed and replaced or repaired by the Contractor in a satisfactory manner at no cost to the City. Methods of repair shall be proposed by the Contractor and submitted to the Engineer for review. The City may conduct independent television inspections, at its own expense, of the lining work at any time prior to the completion of the guarantee period.

3.02 PAYMENT

Paid by Unit Price per Lineal Foot measured along centerline of pipe.

Unit Price shall include all tools, equipment, materials, and labor necessary to install the CIPP. Including but not limited to fabrication, freighting, and furnishing of the CIPP; cleaning; bypassing; acceptance testing; dewatering; placement; flushing; disinfecting; CCTV inspections; all incidental work in the installation of the CIPP; and preparation and implementation of WPCP per Section 01090 – 3.2 – Regulatory Requirements and Permits of these project Specifications.

No additional payment will be made for any excavating, backfilling, or surfacing needed for CIPP installation, inspection, or repair. Backfill material shall be ¾" Class 2 AB, compacted to 95%. Native material may be used for backfill in locations authorized by the Engineer. The AC section shall be 5" or match existing AC depth, whichever is greater. AC shall be compacted to 95% relative compaction. Asphalt binder must be PG64-16. Aggregate must comply with the ½" HMA Types A and B gradation.

If CCTV inspection reveals that point repair(s) are required prior to installation of CIPP lining, the repair will be tracked and paid separately on a time and materials basis.



CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

**APPENDIX A – CALIFORNIA STATE WATER RESOURCE
CONTROL BOARD SEPARATION WAIVER**

OCTOBER, 2019

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State Water Resources Control Board

TO: Ali Rezvani P.E.
Sacramento District Engineer
SACRAMENTO DISTRICT OFFICE
DIVISION OF DRINKING WATER

FROM: Austin Peterson P.E.
Water Resource Control Engineer
SACRAMENTO DISTRICT OFFICE
DIVISION OF DRINKING WATER

DATE: August 6, 2019

SUBJECT: REPLY TO CITY OF PLACERVILLE PUBLIC WATER SYSTEM (PWS NO. 0910003) LETTER DATED JULY 24, 2019 - WAIVER REQUEST CONCERNING THE MOSQUITO ROAD STABILIZATION PROJECT

The State Water Resources Control Board Division of Drinking Water (Division) received a letter dated July 24, 2019, requesting a waiver from the water main separation requirements for the City of Placerville (the City) public water system, (PWS# 0910003), as specified in Section 64572, Article 4, Chapter 16, Division 4, Title 22 of the California Code of Regulations (CCR). The letter requested review of a proposal by the City to mitigate design issues for three (3) locations where it appeared infeasible to adhere strictly to this section of the regulations. The Division received an updated plan set on August 5, 2019, that incorporated minor changes to the design.

The project is within the City's public water system in the city of Placerville. The Mosquito Road Stabilization Project is located near the intersection of Mosquito Road and Hocking Street. This project will construct an 8-inch water main in Mosquito Road.

Specifically, Sections 64572 states:

- (a) New water mains and new supply lines shall not be installed in the same trench as, and shall be at least 10 feet horizontally from and one foot vertically above, any parallel pipeline conveying:
 - (1) Untreated sewage,
 - (2) Primary or secondary treated sewage,
 - (3) Disinfected secondary-2.2 recycled water (defined in section 60301.220),
 - (4) Disinfected secondary-23 recycled water (defined in section 60301.225), and
 - (5) Hazardous fluids such as fuels, industrial wastes, and wastewater sludge.
- (b) New water mains and new supply lines shall be installed at least 4 feet horizontally from, and one foot vertically above, any parallel pipeline conveying:
 - (1) Disinfected tertiary recycled water (defined in section 60301.230), and
 - (2) Storm drainage.

El JORDAN ESQUEVELL, CHAIR / EUREN SOBERRA, EXECUTIVE DIRECTOR

1221 L Street, Sacramento, CA 95814 / Mailing Address: P.O. Box 100, Sacramento, CA 95812-0100 / www.waterboards.ca.gov

- (c) New supply lines conveying raw water to be treated for drinking purposes shall be installed at least 4 feet horizontally from, and one foot vertically below, any water main.
- (d) If crossing a pipeline conveying a fluid listed in subsection (a) or (b), a new water main shall be constructed no less than 45-degrees to and at least one foot above that pipeline. No connection joints shall be made in the water main within eight horizontal feet of the fluid pipeline.
- (e) The vertical separation specified in subsections (a), (b), and (c) is required only when the horizontal distance between a water main and pipeline is less than ten feet.
- (f) New water mains shall not be installed within 100 horizontal feet of the nearest edge of any sanitary landfill, wastewater disposal pond, or hazardous waste disposal site, or within 25 horizontal feet of the nearest edge of any cesspool, septic tank, sewage leach field, seepage pit, underground hazardous material storage tank, or groundwater recharge project site.
- (g) The minimum separation distances set forth in this section shall be measured from the nearest outside edge of each pipe barrel.
- (h) With State Board approval, newly installed water mains may be exempt from the separation distances in this section, except subsection (f), if the newly installed main is:
 - (1) less than 1320 linear feet,
 - (2) replacing an existing main, installed in the same location, and has a diameter no greater than six inches more than the diameter of the main it is replacing, and
 - (3) installed in a manner that minimizes the potential for contamination, including, but not limited to:
 - (A) sleeving the newly installed main, or
 - (B) utilizing upgraded piping material.

Specifically, the City has provided project construction drawings showing the areas where the waivers are being requested.

The waiver from the regulations is requested for the following location:

- 1. An 18-in storm drain pipe crossing the water main (Station 5+10),
- 2. A 21-in storm drain pipe crossing the water main (Station 9+90),
- 3. A 12-in storm drain pipe crossing the water main (Station 10+48)

Attached are the construction drawings showing the areas where variances are being requested. The conflicts are highlighted and numbered as noted above for ease of identification.

The City believes the proposed construction methods will provide the same or a greater level of protection to public health. The restrained joints will help prevent the separation of adjoining pipe sections and reduce the risk that non-potable fluids will enter the water main. The City proposes to line in place each storm drain crossing using CIPP linings. Lining the storm drains will also reduce the risk of stormwater leaking out of the storm drain pipe at the crossing.

The review concluded the following:

- 1. An 18-in storm drain pipe crossing the water main (Station 5+10)
The waiver request for this proposed pipe crossing is acceptable given that all joints are mechanically restrained joints using bolted connections.
- 2. A 21-in storm drain pipe crossing the water main (Station 9+90)

The waiver request for this proposed pipe crossing is acceptable given that all joints are mechanically restrained joints using bolted connections.

3. A 12-in storm drain pipe crossing the water main (Station 10+48)

The waiver request for this proposed pipe crossing is acceptable given that all joints are mechanically restrained joints using bolted connections.

The new water mains in the subject area should be constructed of Pressure Class 350 ductile iron pipe or Class 305 C900 PVC pipe with restrained joints in all areas that do not comply with Section 64572 CCR. At all crossings, a minimum of one-foot vertical separation below the storm drainage or sanitary sewer pipes will be maintained.

As a result of the Division's review of the plans, the following conditions shall be implemented where separation requirements between water mains and storm drain or sanitary sewer pipelines cannot reasonably be met:

Waiver conditions:

1. The water main shall be constructed with Pressure Class 350 ductile iron pipe or Class 305 C900 PVC pipe.
2. Regarding pipelines that are proposed to be constructed and would cross other existing pipelines and cannot meet the minimum required separation, the water main and appurtenances shall be constructed with mechanically restrained joints using bolted connections for the entire length that do not comply with Section 64572 of the CCR.
3. Where the water main crosses below a sanitary sewer or storm drain pipeline, at least one foot of vertical separation shall be maintained at all crossings.
4. The water main shall be placed such that pipe joints will be as distant as possible from the centerline of the storm drain pipeline.

In accordance with Section 64572 of the CCR, the City waiver request for the specifically identified crossings and pipe placement for the Mosquito Road Stabilization Project, submitted on July 24, 2019, agrees with acceptable practices necessary to provide equal protection for the proposed main pipeline construction as required to obtain a written waiver from the Division regarding California Water Works Standards under Section 64551.100, Article 1.5, Chapter 16, Division 4, Title 22 of CCR.

Specifically, Sections 64551.100 states:

- (a) A water system that proposes to use an alternative to a requirement in this chapter shall:
- (1) Demonstrate to the State Board that the proposed alternative would provide at least the same level of protection to public health; and
 - (2) Obtain written approval from the State Board prior to implementation of the alternative.

The waiver is subject to the conditions listed above.

VERIFICATION OF CONSTRUCTION IN ACCORDANCE WITH THE ISSUED WAIVER

Name of Water System: City of Placerville

Public System Number: 0910003

Verification

As required by letter dated **August 7, 2019**, and with respect to waiver issued in accordance with Section 64551.100, Article 1.5, Chapter 16, Division 4, Title 22 of the California Code of Regulations, the undersigned verifies that construction of the **Mosquito Road Stabilization Project** at the following crossings was completed in accordance with requirements stated in the aforementioned waiver letter and its attached memorandum.

The crossings are:

1. An 18-in storm drain pipe crossing the water main (Station 5+10),
2. A 21-in storm drain pipe crossing the water main (Station 9+90),
3. A 12-in storm drain pipe crossing the water main (Station 10+48)

Name

California PE Number

Signature

Date

**THIS FORM MUST BE COMPLETED AND RETURNED TO THE
DIVISION OF DRINKING WATER – SACRAMENTO DISTRICT**

**A COPY OF THIS FORM SHOULD BE FILED AS
PART OF THE PROJECT RECORD DRAWINGS**

Disclosure: Be advised that Section 116725 and 116730 of the California Health and Safety Code states that any person who knowingly makes any false statement on any report or document submitted for the purpose of compliance with the attached order may be liable for a civil penalty not to exceed five thousand dollars (\$5,000) for each separate violation for each day that violation continues. In addition, the violators may be prosecuted in criminal court and upon conviction, be punished by a fine of not more than \$25,000 for each day of violation, or be imprisoned in county jail not to exceed one year, or by both the fine and imprisonment.

**VERIFICATION OF SEWER SERVICE LINES CONSTRUCTION IN ACCORDANCE WITH THE
ISSUED WAIVER**

Name of Public Water System: City of Placerville

Public System Number: 0910003

As required by letter dated **August 7, 2019**, and with respect to waiver issued in accordance with Section 64551.100, Article 1.5, Chapter 16, Division 4, Title 22 of the California Code of Regulations, the undersigned verifies that construction of the Mosquito Road Stabilization Project at the following crossings was completed in accordance with requirements stated in the aforementioned waiver letter.

The crossings are:

Item	Water Main			Sewer Service Lines				
	Station	Size	Material	Size	Material	Fluid	Crossing (Under / Over)	Separation (inches)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Name

California PE Number

Signature

Date

THIS FORM MUST BE COMPLETED AND FILED AS PART OF PROJECT RECORD DRAWINGS

Disclosure: Be advised that Section 116725 and 116730 of the California Health and Safety Code states that any person who knowingly makes any false statement on any report or document submitted for the purpose of compliance with the attached order may be liable for a civil penalty not to exceed five thousand dollars (\$5,000) for each separate violation for each day that violation continues. In addition, the violators may be prosecuted in criminal court and upon conviction, be punished by a fine of not more than \$25,000 for each day of violation, or be imprisoned in county jail not to exceed one year, or by both the fine and imprisonment.

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CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

**APPENDIX B – KORALEEN WATER QUALITY SAMPLING
STATION SHOP DRAWING**

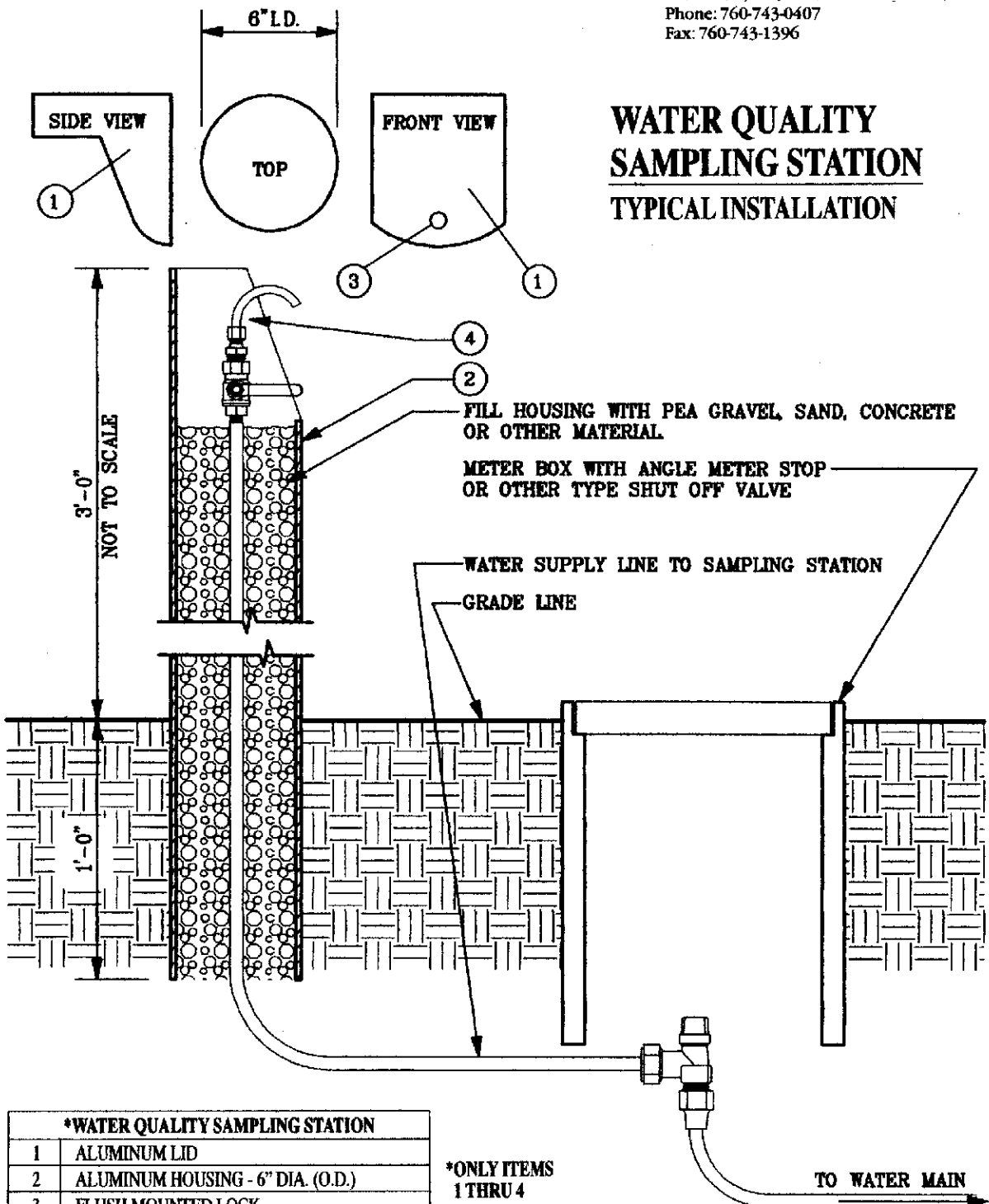
OCTOBER, 2019

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WATER QUALITY SAMPLING STATION

TYPICAL INSTALLATION



*WATER QUALITY SAMPLING STATION	
1	ALUMINUM LID
2	ALUMINUM HOUSING - 6" DIA. (O.D.)
3	FLUSH MOUNTED LOCK
4	1/2" X 3/8" BALL VALVE

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CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

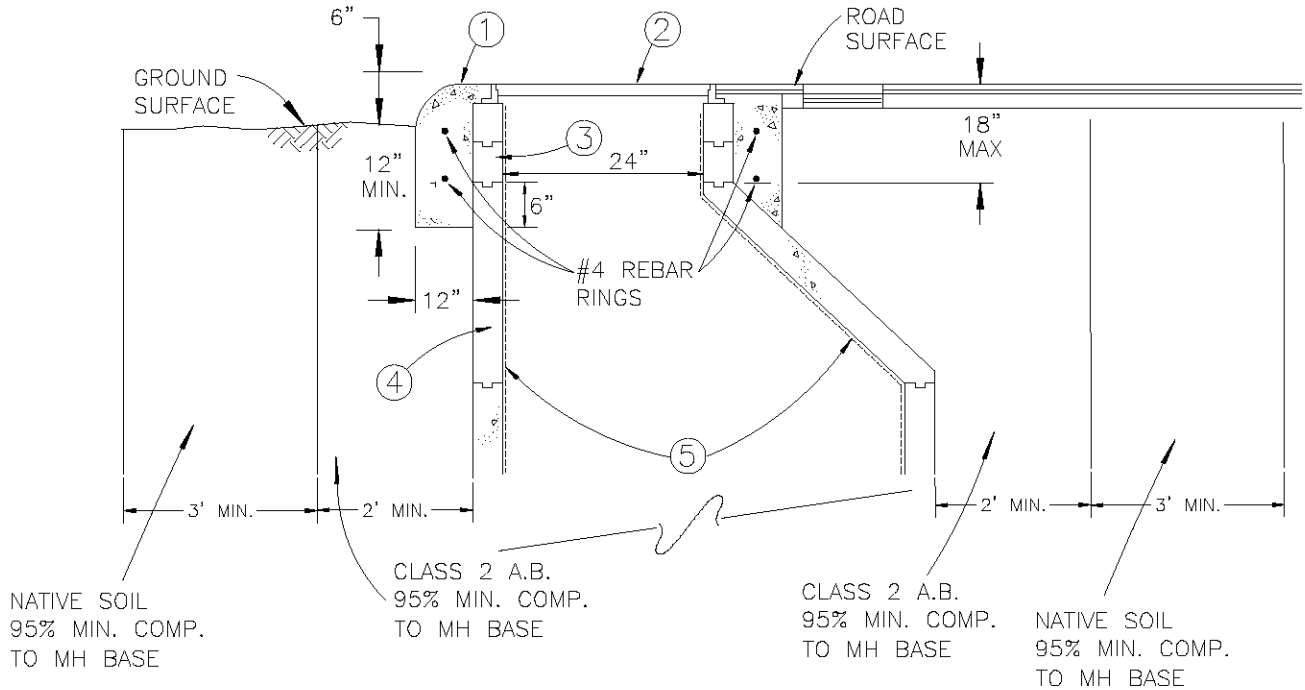
**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

**APPENDIX C – CAST-IN-PLACE MANHOLE STANDARD
DRAWINGS: EID S09B, S09D, S09E, & S09H**

OCTOBER, 2019

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NOTES

1. NATIVE SOIL AND COMPACTION MUST COMPLY WITH EID TECHNICAL SPECIFICATIONS 02220 AND 02221

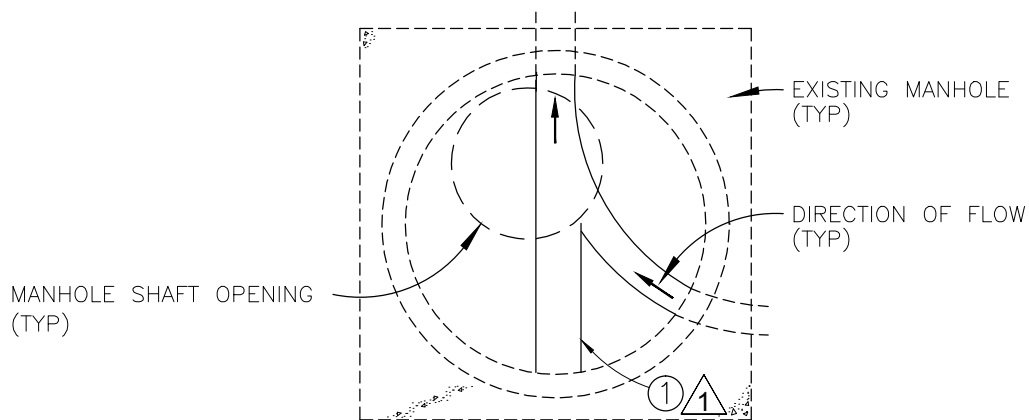
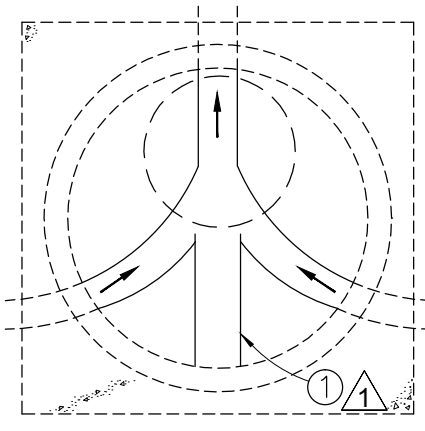
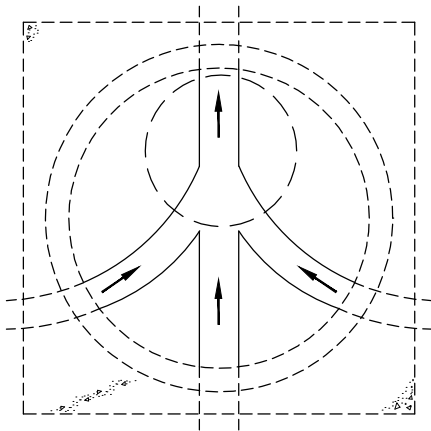
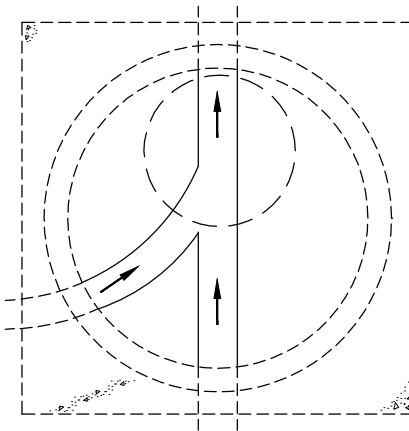
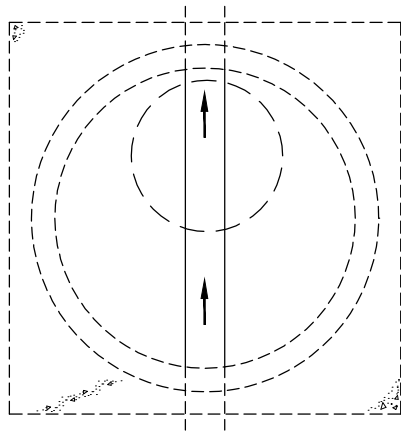
ITEM #	DESCRIPTION
①	CONCRETE COLLAR, EXTEND 6" BELOW GRADE RING
②	FRAME & COVER, STAMPED SEWER
③	GRADE RING, MINIMUM OF ONE PER MANHOLE
④	ECCENTRIC CONE
⑤	LINING

EL DORADO IRRIGATION DISTRICT

MANHOLE CONE SECTION

DRAWN BY A. URTEAGA	SCALE NONE	REVISION	DATE	BY	EID STANDARD DRAWING NO. S09B
APPROVED B. MUELLER	DATE 05/09				

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EL DORADO IRRIGATION DISTRICT

MANHOLE SHAFT ACCESS LOCATIONS AND BASE CONFIGURATIONS

1

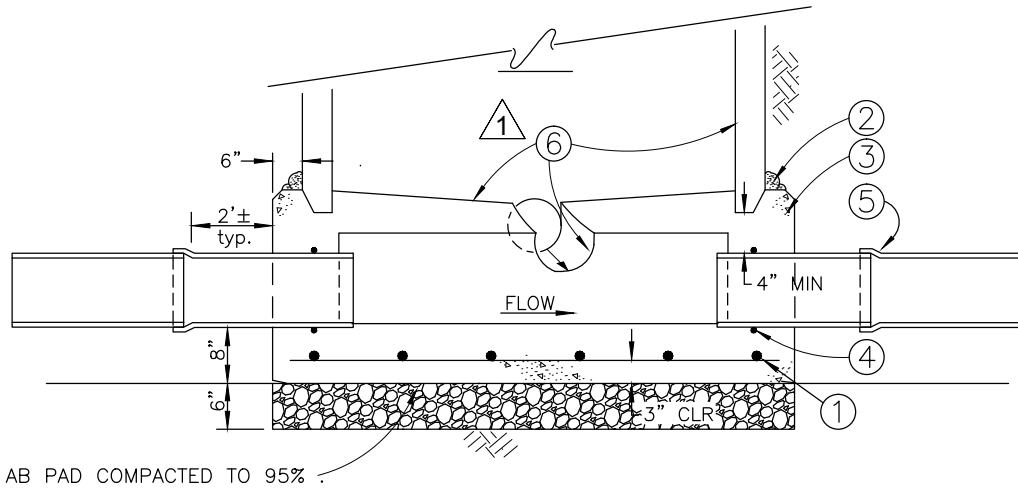
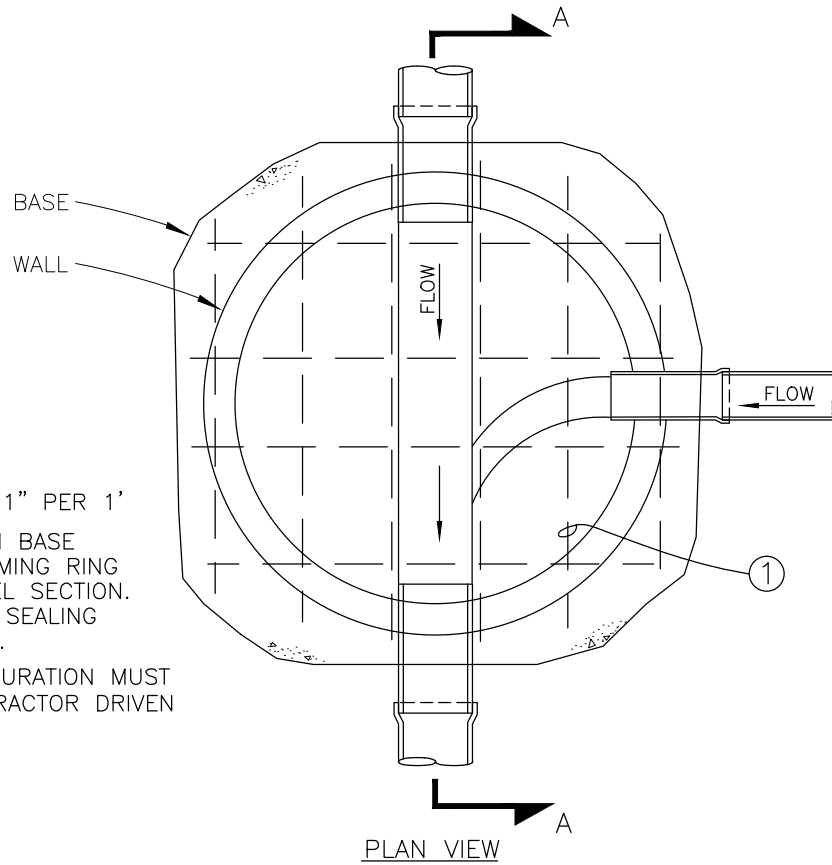
ITEM #	DESCRIPTION
1	CAMERA CHANNEL, MIN. 6" WIDE

DRAWN BY A. URTEAGA	SCALE NONE	REVISION 1	DATE 04/03/14	BY TS	EID STANDARD DRAWING NO. S09D
APPROVED B. MUELLER	DATE 05/09				

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NOTES:

- 1.) SLOPE SHELVES 1" PER 1'
- 2.) FORM RECESS IN BASE WITH METAL FORMING RING TO PLACE BARREL SECTION. INSTALL PLASTIC SEALING GASKET IN JOINT.
- 3.) CHANNEL CONFIGURATION MUST ACCOMMODATE TRACTOR DRIVEN VIDEO CAMERA.



ITEM #	DESCRIPTION
①	#4 GRADE 60 REBAR @ 12" GRID
②	MORTAR
③	CLASS A CONCRETE
④	DOUBLE GASKET WATER STOP
⑤	BELL JOINT OR TWIN-GASKETED COUPLING
⑥	LINING PER MANUFACTURER, WHEN REQUIRED

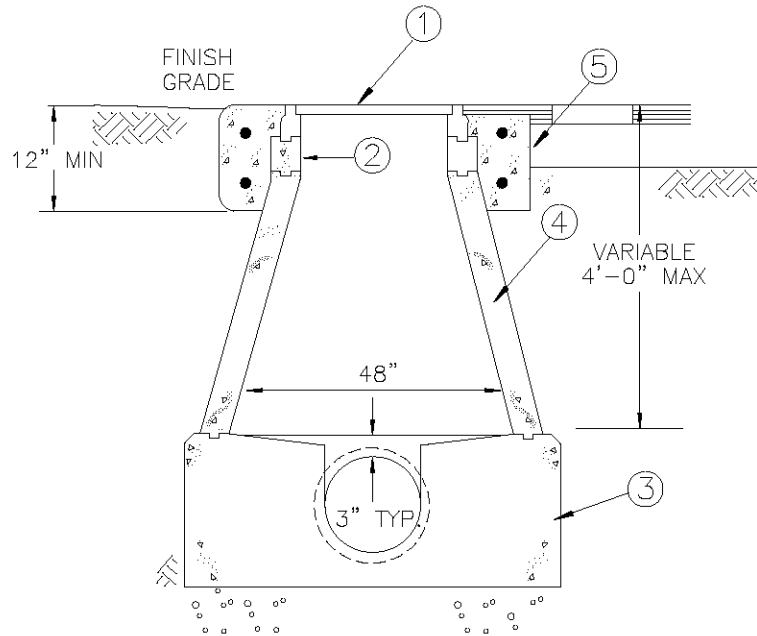
EL DORADO IRRIGATION DISTRICT

CAST-IN-PLACE
CONCRETE MANHOLE BASE

DRAWN BY A. URTEAGA	SCALE NONE	REVISION 1	DATE 04/03/14	BY TS	EID STANDARD DRAWING NO. S09E
APPROVED B. MUELLER	DATE 05/09				



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PLAN

ITEM #	DESCRIPTION
①	FRAME & COVER
②	6" OR 3" GRADE RINGS
③	PRECAST BASE PER EID DWG S09
④	CONCENTRIC CONE
⑤	CONCRETE COLLAR WITH TWO #4 REBAR RINGS

CONSTRUCTION NOTES

1. SHALLOW MANHOLES ARE TO BE INSTALLED FOR DEPTHS AT NO GREATER THAN 4 FEET FROM FINISHED GRADE TO TOP OF PIPE.
2. FLAT-TOP MANHOLE TO BE PRE-APPROVED BY EID.

EL DORADO IRRIGATION DISTRICT

SHALLOW MANHOLE

DRAWN BY A. URTEAGA	SCALE NONE	REVISION	DATE	BY	EID STANDARD DRAWING NO.
APPROVED B. MUELLER	DATE 05/09				S09H

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CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

APPENDIX D – EID TECHINCAL SPECIFICATIONS:
33 01 30. 13 – LEAKAGE TESTING PROCEDURES AND
REQUIREMENTS FOR SEWER PIPES
33 39 13 - MANHOLES

OCTOBER, 2019

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SEWER SYSTEM TESTING

1.0 GENERAL

- 1.1 Scope - This section governs the testing requirements and procedures for acceptance of all completed sewer lines, manholes, and force mains.

It is the intent of the plans and specifications that the completed sewer pipes along with manholes and other appurtenances shall be watertight.

All sewer pipes shall be air tested for leakage. Gravity sewer mains, including services, shall also be visually inspected by video camera and tested for deflection by a mandrel. Manholes shall be hydrostatically tested for infiltration.

All tests shall be made in the presence of the District.

Even though a section may have previously passed the leakage test, each section of sewer shall be tested subsequent to the last backfill compacting operation if, in the opinion of the District heavy compaction equipment or any of the operations of the contractor or others may have damaged or affected the structural integrity or water tightness of the pipe, structure, and appurtenances.

OFFICIAL DISTRICT TESTING WILL NOT BE PERMITTED UNTIL AFTER ALL OTHER UNDERGROUND FACILITIES HAVE BEEN INSTALLED AND THEIR TRENCH COMPACTION VERIFIED.

When lines to be tested are in areas that will be paved, testing shall be done after the rock subgrade is placed and compacted.

- 1.2 Acceptance - The sewer will not be considered acceptable until the leakage or infiltration rate, as determined by test, is less than the maximum allowable.

If the leakage or infiltration rate is greater than the amount specified, the pipe joints shall be repaired or, if necessary, the pipe shall be removed and relayed by the contractors, and retested.

- 1.3 Submittals - The contractor shall notify the District a minimum of 3 business days in advance of its proposed testing schedule for review and concurrence.

2.0 MATERIALS

- 2.1 General - All test equipment, valves, plugs, or other control equipment and materials shall be determined and furnished by the contractor, subject to District review. No materials shall be used which would be injurious to the construction or its future function.

3.0 EXECUTION

- 3.1 Mandrel Test for Gravity Sewers - After completion of the sewer line, the line shall be ball flushed just prior to pulling the mandrel through.

A commercially manufactured, rigid, odd-numbered leg (9 legs minimum) mandrel, with a circular cross section having a diameter of at least 95% of the specified average inside diameter, shall be pulled through the pipe by hand. The minimum length of the mandrel shall be equal to the base inside diameter of the pipe. Obstructions encountered by the mandrel shall be corrected by the contractor.

- 3.2 Air Test for Gravity Sewers - After the mandrel test, each section of sewer between successive manholes shall be air tested as follows:

- A. With all outlets plugged, air shall be slowly added until the internal pressure is raised to 4.0 pounds per square inch gage (psig). The compressor used to add air to the pipe shall have a relief valve set at 5 psig to ensure that at no time the internal pressure in the pipe exceeds 5 psig.
- B. The internal pressure of 4 psig shall be maintained for at least two minutes to allow the air temperature to stabilize, after which the air supply shall be disconnected and the pressure allowed to decrease to 3.5 psig.
- C. The time in minutes that is required for the internal air pressure to drop from 3.5 psig to 3.0 psig shall be measured. The results shall not be less than the minimum permissible duration for the air test pressure drop shown in Table I.

TABLE I
MINIMUM TIME FOR
AIR PRESSURE DROP OF 0.5 PSIG

Pipe Diameter (in.)	Time for Length Shown (in Minutes/Seconds)				
	0-200'	201-250'	251-300'	301-350'	351-400'
6	2:50	2:50	2:50	2:50	2:50
8	3:50	3:50	3:50	4:30	5:00
10	4:40	5:00	6:00	7:00	7:50
12	5:40	7:10	8:30	10:00	11:20

- D. Should groundwater be present above the flowline of the pipe, the air pressure added to the 3.5 psig criteria shall be calculated by dividing the vertical height, in feet of groundwater above the flowline, by 2.31. The starting test pressure shall not exceed 9.0 psig.
- E. If the time shown in Table I for the designated pipe size and length elapses before the air pressure drops 0.5 psig; the section being tested shall have passed and the test discontinued.

3.3 Manhole Test - Water tightness of manholes may be tested in connection with tests of sanitary sewers or at the time the manhole is completed and backfilled. The test shall be as follows:

- A. The contractor shall plug all inlets and outlets with approved stoppers or plugs.
- B. The manhole shall be filled with water to the top of the frame.
- C. The water shall stand in the manhole for a minimum of one hour to allow the manhole material to reach maximum absorption.
- D. The contractor shall refill the manhole to the original depth.
- E. The time of the test will be determined by the District to fit the various field conditions.
- F. The manhole shall be refilled to the original depth and the amount of water required to fill the manhole shall be recorded.
- G. If the amount of water added does not exceed the limits shown in Table II, then the manhole has passed the test.

TABLE II

<u>Depth of Manhole (ft.)</u>	<u>Allowable Amount of water added (gal.)</u>
0-5	1
6-7	1-1/2
8-10	2
11-12	2-1/2
13-15	3
16-18	3-1/2
19-20	4

- H. Even though the leakage may be less than the specified amount, the contractor shall stop any leaks that may be observed to the satisfaction of the District.
- I. For manholes that require lining the inlet(s) and outlet shall be mandrel tested after the lining is applied to verify flowline has not been compromised.

3.4 Video Test- All sewer collectors and laterals shall be T.V. inspected prior to pavement placement in accordance to the following:

- A. The complete job is ready for television inspection when the following work has been completed and approved by the District:
 - 1. All sewer pipelines are installed, backfilled, and compacted.
 - 2. All manholes are in place, all channeling is complete and pipelines are accessible from manholes, and testing completed.
 - 3. All other underground facilities, utility piping and conduits are installed.
 - 4. Final sub grade is complete. For wet weather periods, placement of aggregate base has been completed.
 - 5. Pipelines to be inspected have been cleaned and flushed per Section 3.1.
 - 6. Final air test has been completed per Section 3.2.
- B. After the above work is complete, the contractor shall schedule the video inspection. The video test shall be done in the presence of the District's inspector. Water is to flow through the lines for 12

hours prior to the T.V. work. During the video for service, some water must be flowing for camera orientation. The camera shall have a device to measure depths.

- C. If no deficiencies are observed, the work will be considered satisfactory.
- D. A videotape will be made .and given to the District, and defects serious enough to require correction will be determined by the District.
- E. Notification will be made in writing of any deficiencies revealed by the video that will require repair. If corrective work is indicated and viewing of the videotapes is desired, the District shall be contacted to set a time for the viewing with the Engineer.
- F. Corrective work shall be done. District reserves the right to require another test of any repair.
- G. Those portions of the pipeline system that have been corrected will be re-inspected.
- H. The following observations from television inspections will be considered defects in the construction of sewer pipelines and will require correction prior to paving:
 - 1. Low spots, 1/2-inch and greater
 - 2. Joint separations
 - 3. Cocked joints present in straight runs or on the wrong side of pipe curves
 - 4. Cracked or damaged pipe
 - 5. Dropped joints
 - 6. Infiltration
 - 7. Debris or other foreign objects
 - 8. Other obvious deficiencies
 - 9. Irregular condition without logical explanation
 - 10. Standing water in service laterals

- 3.5 Sewer Force Main Test - Leakage test for sewer force mains shall follow the procedures set forth in Technical Specification 33 13 00 "Testing and Disinfecting Water Mains" Subsection 3.2.

All defective elements shall be repaired, or removed and replaced, and then retested until all visible leakage has been stopped and the allowable leakage requirements have been met.

END OF SECTION

MANHOLES

1.0 GENERAL

- 1.1 Scope - The work covered by this section shall consist of furnishing all materials, accessories, equipment, tools, transportation, service, labor and performing all operations to furnish and install concrete manholes in accordance with this section of the specifications and applicable drawings. Testing of manholes shall be done in accordance with Section 33 01 30.13.

Precast concrete bases, wall sections, and covers shall be manufactured in a facility especially designed for that purpose and shall conform to the shapes and dimensions indicated on the plans.

- 1.2 Submittals - Prior to installation, the following information is to be submitted:
- A. Manufacturer's catalog data on precast items. Show dimensions, reinforcing thickness of walls, and top slab shall be shown. Show materials of construction by ASTM reference and grade.
 - B. Concrete mix design and reinforcing for cast-in-place concrete item.
- 1.3 Design Loads - Design loads shall consist of dead load, live load, impact, and, in addition, loads due to water table and any other loads which may be imposed upon the manhole.

2.0 MATERIALS

- 2.1 Concrete - Portland cement concrete shall conform to Class A as specified in the Caltrans Standard Specifications Section 90, "Portland Cement Concrete."
- 2.2 Reinforcement - Reinforcement shall be deformed reinforcement in accordance with ASTM A615 or ASTM A497 for welded deformed wire fabric.
- 2.3 Base Rock - Base Rock shall be 3/4-inch aggregate base conforming to Caltrans Specifications for Class 2 aggregate base.
- 2.4 Precast Manhole Wall Sections - Precast manhole sections shall be of the size indicated on the Drawings. The contractor shall provide the District with a Certificate of Compliance from the manhole manufacturer that the

manholes and concrete mix conform in all respects to these specifications and requirements of ASTM C478. Minimum wall thickness shall be 4 inches. Cones shall have the same wall thickness and reinforcement as manhole section. The top and bottom of all sections shall be parallel.

Joints shall be tongue-and-groove type.

- 2.5 Precast Base Sections and Adaptor Ring - Unless otherwise approved, all concrete manhole bases shall be precast. Connections to the base shall be made with elastomeric boots or an approved cast-in adaptor.
- 2.6 Manhole Extensions - Concrete grade rings for extensions shall be a maximum of six-inches high and shall be approved by the District before installation.
- 2.7 Mortar - Standard premixed mortar conforming to ASTM C387 or proportion 1 part Portland cement with 2 parts clean, well graded sand which will pass a 1/8-inch screen. Admixtures may be used provided they do not exceed the following percentages by weight of cement: Hydrated lime, 10%; diatomaceous earth or other inert materials, 5%. Consistency of mortar shall be such that it will readily adhere to the applied surface. Mortar mixed for longer than 30 minutes shall not be used.
- 2.8 Preformed Plastic Gaskets - Preformed plastic gaskets shall be used for the manhole assembly and shall be Kent-Seal No. 2 manufactured by Hamilton Kent Manufacturing Company, Box 178, Kent, OH 44240; Ram-Nek, manufactured by K.T. Snyder Company, Inc., Central National Bank Bldg., Houston, TX 77002; or equal, meeting all requirements of Federal Specifications SS-S00210.
- 2.9 Manhole Frames and Covers - Covers shall have the word SEWER in raised two-inch letters. Castings shall be tough, close-grained gray iron, sound, smooth, clean, free from blisters, blowholes, shrinkage, cold shuts, and all defects, and shall conform to ASTM A48, Class 30B. All bearing surfaces shall be machined to ensure true flat surfaces. Covers shall be true and seat within the ring at all points. Frames shall be water tight and be of the grooved gasketed type. Manhole frames and covers shall be as shown on the approved Materials List.
- 2.10 Backfill Material - Backfill material shall conform to Section 31 23 16. When material from the excavation is unsuitable for use in backfill, it shall be disposed of and suitable material, which is capable of attaining the required relative compaction, shall be arranged for and furnished.

3.0 EXECUTION

- 3.1 Excavation - The contractor shall prepare an excavation large enough to accommodate the structure and permit grouting of openings and backfilling operations. Excavations shall be made in accordance to Section 31 23 16. No earth backfill will be permitted to correct overdepth excavation. Over excavation shall be corrected as described in Section 31 23 16-3.2.
- 3.2 Precast Bases - Precast bases shall be placed on six-inches of pipe bedding material compacted to 95% and graded level. The top of the base, when installed, shall be level in all directions.
- 3.3 Cast-in-Place Bases - Manhole base shall be poured in accordance to the standard drawing against undisturbed soil. All vertical surfaces shall be poured against approved forms. The base shall extend to the lines shown on the details.

The manhole stubs and sewer main shall be set before the concrete is placed and shall be rechecked for alignment and grade before the concrete has set. The various sized inlets and outlets to the manhole shall be located as indicated on the plans and as detailed in the detail drawings. Invert elevations of connecting sewers may vary.

The invert of the manhole base shall be hand worked so as to provide channels conforming in size and shape to the lower portions of the inlets and outlets. The manhole invert channels shall be smooth and accurately shaped. Channels may be formed directly in the concrete base.

All transitions shall be smooth and of the proper radius to give an uninterrupted transition of flow.

The concrete base shall be shaped with a wood float and shall receive a hard steel trowel finish before the concrete sets.

In the event additional mortar is required after initial set has taken place, the surface to receive the mortar shall be primed, and the mortar mixed with a concrete adhesive in the amounts and proportions recommended by the manufacturer and as directed by the District in order to secure as chip-proof a result as possible.

The bases shall set a minimum of 24 hours before manhole construction is continued. In certain critical situations, the time of setting may be reduced upon approval of the District.

- 3.4 Manhole Assembly - Manhole assembly shall be as shown on the standard drawings. Each precast concrete unit shall be set plumb using preformed plastic gaskets at all joints.

It is the intent of these specifications that manholes and appurtenances be watertight and free from infiltrations. Manholes shall be free of any seeping or surface moisture prior to the application of a protective lining or coating. Adequate watertightness of manholes and appurtenances shall be determined by the District upon completion of testing by the contractor. All stubs shall be plugged with stoppers or brick wall plugs as shown on the plans for various sizes of pipe.

In order to prevent accidental use of the new sewer before completion and acceptance, the inlet to existing tie-in manholes shall be sealed. Installation of these plugs shall be approved by the District. Plugs shall be removed at the time of final inspection or as directed by the District.

- 3.5 New Connections to Existing Manholes - New connections to existing manholes, where stubs have not been provided, shall be made by core drilling through the wall and rebuilding the manhole bench as shown on the standard drawings.
- 3.6 Backfill - Backfill around manholes shall be placed and compacted in accordance to Section 31 23 16.

END OF SECTION



CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

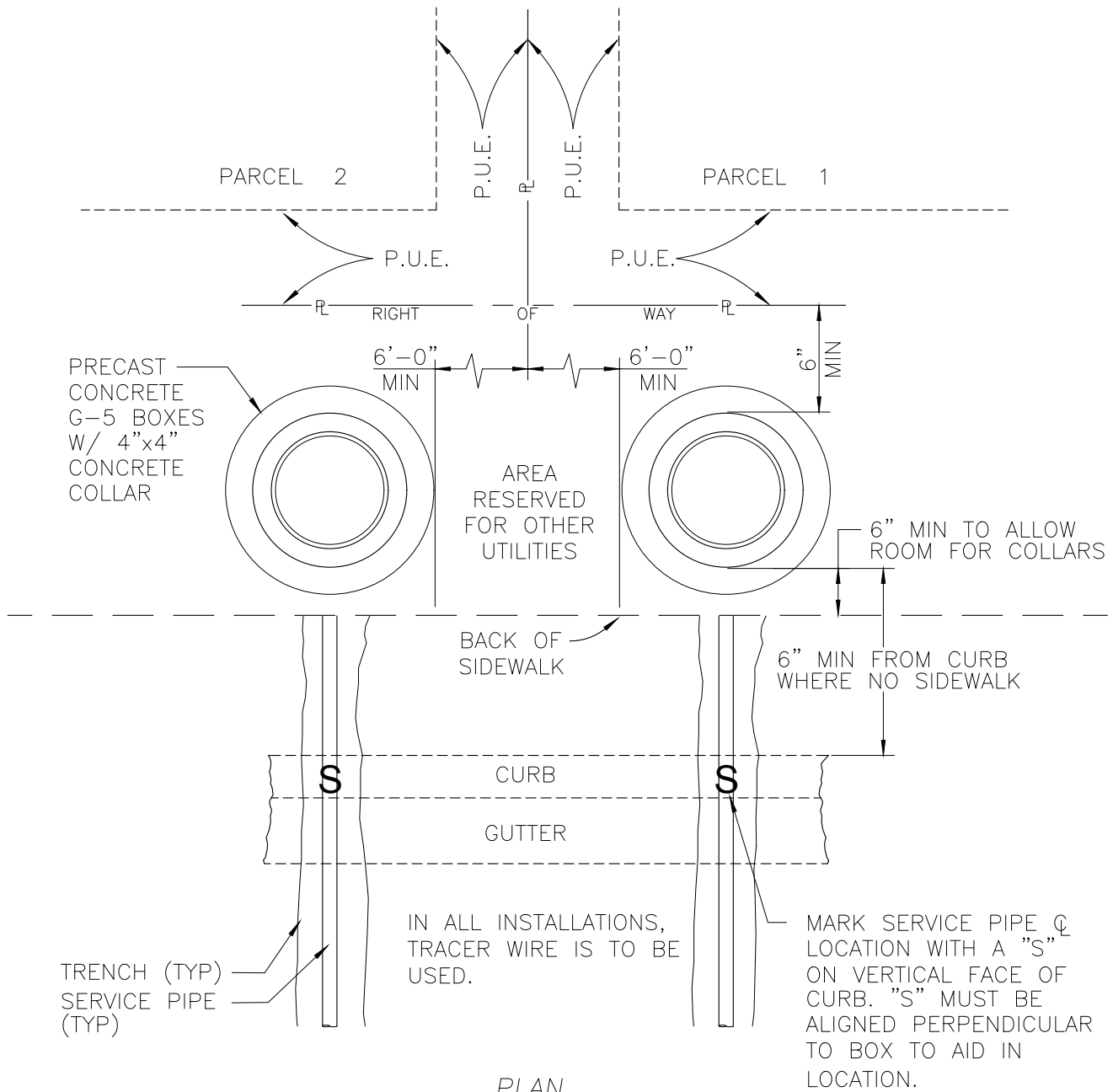
Project No. 41819

APPENDIX E – SEWER CLEANOUTS STANDARD
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OCTOBER, 2019

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EL DORADO IRRIGATION DISTRICT

SEWER CLEANOUT PLACEMENT

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CITY OF PLACERVILLE
ENGINEERING DEPARTMENT

**MEASURE H&L PROJECT
MOSQUITO ROAD STABILIZATION PROJECT – PHASE 1**

Project No. 41819

**APPENDIX F – CONTAMINATED SOIL MANGAGEMENT PLAN
GEOCON CONSULTANTS, INC. (SEPTEMBER 2019)**

OCTOBER, 2019

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SOIL MANAGEMENT PLAN

MOSQUITO ROAD WATERLINE REPLACEMENT FROM CLAY STREET TO 700 FEET NORTHEAST OF DIMITY LANE PLACERVILLE, CALIFORNIA



GEOCON
CONSULTANTS, INC.

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR
CITY OF PLACERVILLE

PREPARED BY
GEOCON CONSULTANTS, INC.
RANCHO CORDOVA, CALIFORNIA

GEOCON PROJECT NO. S1830-03-01

SEPTEMBER 2019



Project No. S1830-03-01
September 11, 2019

A. Cory Schiestel, P.E.
Associate Civil Engineer
City of Placerville
3101 Center Street
Placerville, California 95667

Subject: SOIL MANAGEMENT PLAN
MOSQUITO ROAD WATERLINE REPLACEMENT
FROM CLAY STREET TO 700 FEET NORTHEAST OF DIMITY LANE
PLACERVILLE, CALIFORNIA

Mr. Schiestel:

In accordance with your request, we are pleased to provide the City of Placerville with this Soil Management Plan (SMP) for the Mosquito Road waterline replacement located on Mosquito Road from Clay Street to 700 feet northeast of Dimity Lane (the Site) in Placerville, California. The SMP provides guidelines for management of soil containing hazardous substances and/or petroleum products that may be encountered during construction at the Site.

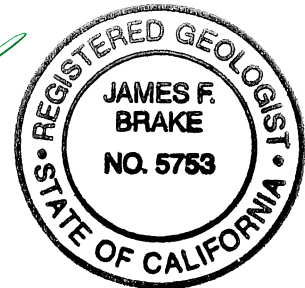
We appreciate the opportunity to assist you with this project. Please let us know if you have questions regarding the SMP or if we can be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.

Nicole Hastings-Bethel
Project Environmental Scientist

Jim Brake, PG
Senior Geologist



CC: Aaron Brusatori, R.E.Y. Engineers, Inc.

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FIGURES

1. Vicinity Map
2. Site Plan

APPENDICES

- A. Health and Safety Plan

SOIL MANAGEMENT PLAN

1.0 INTRODUCTION

This Soil Management Plan (SMP) provides guidelines for the management of soil containing hazardous substances and/or petroleum hydrocarbons that may be encountered during replacement of a waterline along Mosquito Road from Clay Street to 700 feet northeast of Dimity Lane (the Site) in Placerville, California (Figure 1). This SMP was prepared for the City of Placerville (the City) and will serve as a reference document for the City, the City's contractor to be determined (TBD), and Geocon Consultants, Inc.

Section 2 of this SMP defines the purpose and objectives of the SMP. Section 3 provides site background information including a description of the Site, its past use, and a brief synopsis of the known contaminants of concern (COCs) and locations on the Site. Section 4 lists site/project-related contacts and notification procedures for several project incident scenarios. Section 5 describes the regulatory agency involvement on the project related to contaminated soil handling, reuse/disposal, and confirmation sampling. Section 6 describes security procedures to be implemented during the project for worker and public safety. Section 7 describes health and safety guidelines for the project related to handling of contaminated soil. Section 8 describes soil management procedures for various soil-disturbing or handling activities including:

- observation during excavation;
- onsite stockpiling and loading;
- confirmation sampling; and
- transporting and offsite disposal.

Section 9 describes the laboratory chemical analyses for the COCs, Section 10 summarizes health risk-based screening criteria specific to each COC, and Section 11 describes project documentation including daily field records and a completion memorandum that will be prepared following completion of site grading/excavation and any impacted soil removal that is performed.

2.0 PURPOSE AND OBJECTIVES

The purpose of this SMP is to describe protocols and procedures for management of:

1. visibly contaminated soil encountered during construction earthmoving activities (excavation and grading) at the Site;
2. undocumented subsurface equipment and features (i.e., underground storage tanks [USTs], piping, sumps, separators, buried debris, etc.) encountered during construction earthmoving activities; and
3. surplus soil that is generated during construction that must be removed from the Site whether or not it appears to be visibly contaminated.

The objective of the SMP is to provide the project team with site background information regarding known, suspected, or potential contamination and related subsurface equipment or features that could be encountered, project notification contacts, procedures and guidelines for soil management, and a health and safety plan (HSP) specific to the Site and anticipated COCs.

3.0 BACKGROUND INFORMATION

This section summarizes background information for the Site including its location and physical characteristics, project background, soil and groundwater conditions, and the environmental condition of the Site based on the findings of previous assessments and investigations.

3.1 Site Location and Project Description

The Site is located along Mosquito Road, from Clay Street to 700 feet northeast of Dimity Lane in Placerville, California (Figure 2). Mosquito Road is a two-lane public road with a paved median in a commercial area of Placerville, approximately 600 feet north of Highway 50.

The City plans to replace an existing water pipeline that extends along the center of Mosquito Road. The existing pipeline may be excavated and removed or capped and left in place in sections to accommodate installation of the new pipeline. The depth of trenching in the project area is not yet known.

3.2 Project Background

The City is concerned that construction excavation for the project will encounter petroleum-impacted soil. In May 2019, construction crews for the City encountered possible petroleum in soil along an approximately 450-foot-long section of existing pipeline adjacent to a Pacific Pride fueling station and Hunt and Sons Card Lock at 2891 Mosquito Road while excavating preliminary potholes to identify the depth and diameter of the existing pipeline. Crews reported “possible contamination” in three consecutive exploratory potholes, #2, #B, and #3 adjacent to the Hunt and Sons facility (Figure 2). Apparent contamination was not observed in the outlying potholes #A or #4 (Figure 2).

3.3 Soil and Groundwater Conditions

Information available on the California State Water Resources Control Board’s GeoTracker online database (<http://geotracker.waterboards.ca.gov>) shows that there is an open Leaking Underground Storage Tank (LUST) regulatory case for “D.W. Petroleum – Card Lock” at 2891 Mosquito Road; however, the case is being reviewed for low-threat closure and a request for destruction of the monitoring wells onsite has been issued to complete the case closure process. Stratus Environmental prepared a *Low-Threat Closure Policy Evaluation* in January 2017. In that document, diesel and gasoline concentrations in soil are depicted to range from 5 to 49 milligrams per kilogram (mg/kg) at the property edge between the ground surface and a depth of 6 feet, but are not depicted as extending beneath the center of Mosquito Road. The nearest groundwater monitoring well is MW-6, which according to the City is now abandoned, was located less than 20 feet north-northeast of pothole #2

(Figure 2). Depth to groundwater in that well has fluctuated from approximately 2 to 12 feet with an average of approximately 8 feet between 2002 and 2016. Petroleum hydrocarbons were not detected in groundwater samples collected from MW-6 in September 2016, but historically diesel and gasoline were detected in samples from this well with maximum concentrations of 490 and 420 micrograms per liter, respectively.

Soil samples were not collected from the potentially contaminated soil observed by City construction crews in May 2019; however, based on the information provided in the *Low-Threat Closure Policy Evaluation* for the open LUST case, it is unlikely that contamination is present at concentrations that are hazardous to workers; however, if surplus soil is generated during construction of the pipeline, and it is contaminated, then it should be properly disposed of. Additionally, given the shallow depth of groundwater reported in MW-6, groundwater could be encountered during excavation, especially during the winter or spring, and if dewatering is required, then the water that is generated should be sampled, analyzed, and properly disposed of.

Given the use of the adjacent property as a gas station and the documented presence of petroleum in soil and groundwater there, COCs at the Site are anticipated to include:

- gasoline-, diesel-, and oil-range organics (GRO/DRO/ORO);
- associated volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE); and
- metals including lead.

4.0 PROJECT CONTACTS AND NOTIFICATION PROCEDURES

This section provides project contact information and specifies procedures for notification under a variety of potential scenarios related to encountering apparent petroleum product/hazardous substance impacts to soil or subsurface equipment/features that could contain petroleum products or hazardous substances.

4.1 Project Contacts

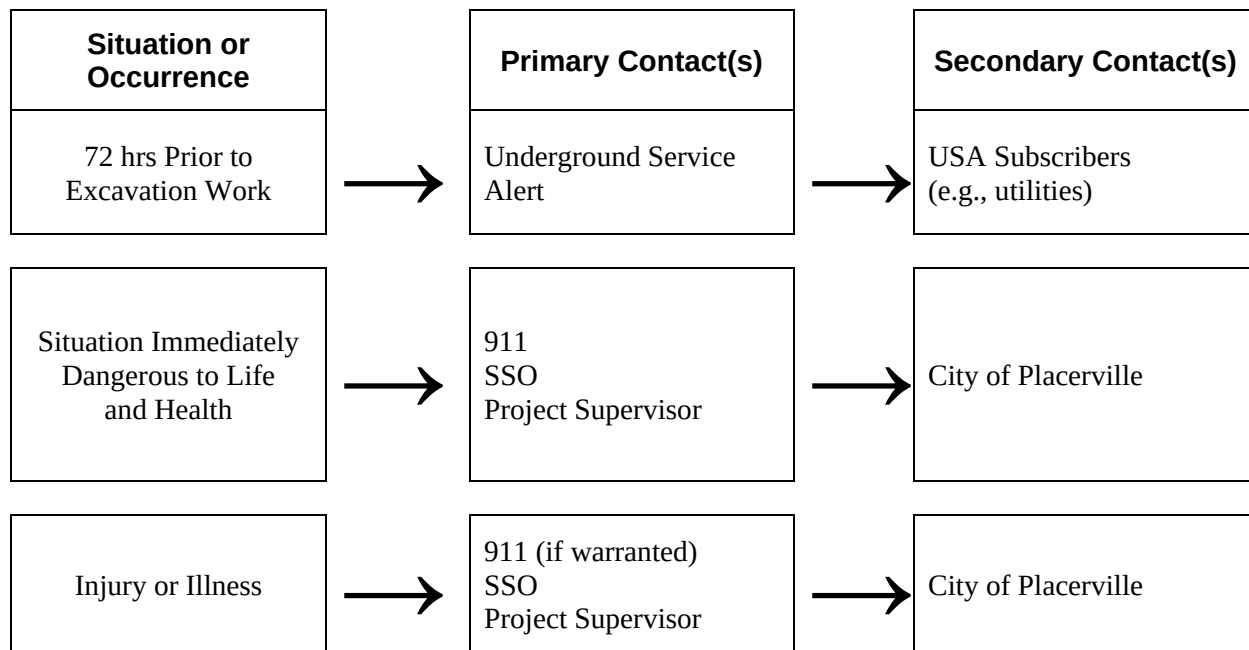
The following table lists potential contacts, their affiliation, and their responsibility with respect to activities associated with this SMP.

Contact	Affiliation	Responsibility
A. Cory Schiestel, P.E. Associate Civil Engineer (530) 642-5557	City of Placerville 3101 Center Street, Placerville, CA 95667	Oversight of project development and Construction Program Manager
Jim Brake, PG Environmental Project Manager (916) 852-9118	Geocon Consultants, Inc. 3160 Gold Valley Dr.,#800 Rancho Cordova, CA 95742	Oversight of Geocon soil management activities and reporting.

Contact	Affiliation	Responsibility
TBD Supervising Environmental Specialist Office (530) 621-5300	El Dorado County Environmental Management Department (EDCEMD) 2850 Fairlane Court, Building C Placerville, CA 95667	Regulatory oversight
Site Safety Officer (SSO) Nicole Hastings-Bethel (805) 801-4998	Geocon Consultants, Inc. 3160 Gold Valley Dr., #800 Rancho Cordova, California 95742	Health and Safety Plan Implementation
Project Supervisor Brett Stone (530) 391-3930	City of Placerville 3101 Center Street, Placerville, CA 95667	Daily Construction Inspector
Emergency: 911	El Dorado County Fire Station 25 3034 Sacramento Street Placerville, California	Emergency Response
(800) 227-2600	Northern California Underground Service Alert (USA)	Underground Facility Damage Prevention

4.2 Notification Procedures

The following summarizes notification procedures to be implemented for situations or occurrences that may develop during site construction activities. Onsite personnel that observe the situations or occurrences indicated below will notify the primary contact, who in-turn will notify secondary contacts as deemed appropriate. Contact names and phone numbers are indicated in Section 4.1 above.



Situation or Occurrence		Primary Contact(s)		Secondary Contact(s)
Accident Resulting in Property Damage	→	SSO Project Supervisor	→	City of Placerville
“Chemical” Odor Detected	→	911 (if warranted) SSO Project Supervisor Environmental Consultant	→	City of Placerville
“Contaminated” Soil Observed	→	SSO Project Supervisor Environmental Consultant	→	City of Placerville
Groundwater Encountered	→	SSO Project Supervisor Environmental Consultant	→	City of Placerville
Unanticipated Subsurface Facilities (tanks, piping, etc)	→	SSO Project Supervisor Environmental Consultant	→	City of Placerville
“When in Doubt”	→	SSO Project Supervisor Environmental Consultant	→	City of Placerville

5.0 REGULATORY ENVIRONMENTAL OVERSIGHT AND PERMIT REQUIREMENTS

This section summarizes oversight by the appropriate regulatory agencies for actions that could potentially be undertaken at the Site (i.e., contaminated soil removal, UST removal, etc.). Also summarized are permit requirements for potential actions such as UST removal.

5.1 El Dorado County Environmental Management Department

The EDCEMD is to be the regulatory oversight agency in the event that significant apparent contamination or undocumented USTs are encountered at the Site. There are no known, documented USTs present on the Site. However, in the event that an undocumented UST is encountered during project construction earthmoving activities, the UST would be removed under permit from the EDCEMD. Prior to removal of a UST, the removal contractor (Geocon or other) shall obtain a permit from the EDCEMD. The permit process involves submission of a UST removal application to the EDCEMD and payment of a required fee of \$655.72.

5.2 Central Valley Regional Water Quality Control Board and California Department of Toxic Substances Control

Depending on the complexity of contaminant impacts discovered at the Site or at their discretion, the EDCEMD may refer the Site to the Central Valley Regional Water Quality Control Board (CVRWQCB) or the California Department of Toxic Substances Control (DTSC) for regulatory oversight. The CVRWQCB or DTSC may request additional investigation of soil, soil vapor, and groundwater beyond that which has already occurred or will occur. Given the adjacent open LUST case, oversight would likely be referred to the CVRWQCB.

6.0 SECURITY PROCEDURES

The project location is in the median of a busy roadway, so traffic control including signage, delineators, barricades, flaggers, and other safety precautions is already anticipated for this project. Additionally, it is anticipated that excavations will be backfilled or if left unattended, covered with steel plates. The anticipated safety measures to keep workers and the public safe from physical hazards will also suffice for the potential chemical hazards (if encountered).

7.0 HEALTH AND SAFETY

Each contractor associated with soil excavation, handling, sampling, stockpiling, truck-loading, and transportation shall be responsible for providing and implementing their own project-specific HSP prepared in accordance with applicable California Occupational Safety and Health Administration (OSHA) requirements. An HSP is a compilation of health and safety guidelines, policies and/or performance protocols that, when exercised, are intended to reduce or eliminate the potential for injury and exposure during the performance of field activities at a site. A complete copy of the contractor's HSPs must be onsite at all times while work is being conducted. A copy of our HSP is in Appendix A.

HSPs must designate an SSO who will oversee field activities and be responsible for implementation of the HSP. The SSO has the authority to temporarily suspend project activities any time he/she determines that the provisions of the HSP are inadequate to provide a service/project environment conducive to employee safety. The SSO will inform project managers of individuals whose onsite actions jeopardize either their health and safety or the health and safety of others. The SSO's responsibilities include:

- Maintaining safety equipment and supplies;
- Performing air monitoring, as appropriate;
- Directing decontamination operations, as appropriate;
- First line enforcement of the HSP;
- Directing emergency response operations until public emergency personnel arrive;
- Setting up site controls, as appropriate; and
- Reporting incidents and HSP infractions to the Project Manager.

Contractors shall be responsible for making their respective HSPs and SSO available to onsite workers who could potentially be exposed to the job hazards reasonably anticipated during work. Contractors shall be responsible for providing worker HSP training and education as applicable during "tailgate" safety meetings conducted daily prior to the start of work and on an impromptu "as needed" basis during the work day when unhealthful/unsafe work practices or situations are observed. Health and safety meetings address the following subjects, as applicable:

- The project scope of work or any changes to the scope;
- Recognized changes to site conditions;
- Review of safe work practices;
- On or off the project safety practices;
- Feedback from employees on hazards, safety suggestions, or concerns; and
- Recognition for compliance, good safety performance or attitude.

Attendance at health and safety meetings will be considered part of each employee's job responsibilities. Each employee shall be responsible for their compliance with their respective HSP and shall be responsible for notifying the SSO when infractions to the HSP are detected.

8.0 SOIL MANAGEMENT

Construction earthmoving at the Site may encounter apparently COC-containing/impacted soil (visibly discolored, chemical odor, PID readings, etc.) or generate soil that does not appear to contain COCs, but that is “surplus” and must be removed from the Site. Soil management will include observation of soil, assessment of the potential presence of COCs in soil, stockpiling, and stockpile waste characterization to ensure compliance with this SMP and EDCEMD requirements. The following sections summarize management of non-impacted and impacted soil, soil characterization sampling procedures, and soil transportation for disposal.

8.1 Management of Non-impacted Soil

In the absence of obvious discoloration, chemical odors, elevated photo-ionization detector (PID) readings, or other indicators of apparent contamination, soil that is excavated (for utility trenches) should be suitable for onsite reuse. Apparently non-impacted surplus soil should be characterized to determine if it can be taken to other properties for use as “clean” fill or if it must be disposed of at an offsite disposal facility as summarized in Section 8.4.

Excavated pavement (e.g., asphalt and concrete) and other construction materials or debris shall be transported offsite to an appropriate local recycling facility or disposed offsite as general construction debris at a disposal facility according to applicable disposal requirements.

8.2 Management of Impacted Soil

If apparently impacted soil is encountered during earthmoving, onsite personnel shall immediately notify the SSO and construction project manager. Apparently impacted soil shall be excavated and temporarily stockpiled on and covered with 10-mil polyethylene sheeting to prohibit wind dispersal, sediment transport in stormwater runoff, and contact with underlying non-impacted soil. Stockpiled, impacted soil shall be characterized according to the procedures indicated in Section 8.3 to determine if onsite reuse is possible or appropriate offsite disposal options.

8.3 Soil and Groundwater Sampling Procedures

Soil samples may be collected from visibly impacted soil in the trench sidewalls or base (“in-situ” samples) or from soil already excavated and stockpiled to assess the potential presence of COCs in the soil or to characterize excavated soil for offsite disposal or reuse. Groundwater samples may be collected from water that seeps into the trench or from holding tanks following dewatering of the trench. Soil and groundwater samples will be collected and handled in accordance with industry-standard procedures as described in the following sub-sections.

8.3.1 In-situ Soil

- Soil samples will be collected in 6-inch-long by 2-inch-diameter stainless steel sample rings driven into in-situ (undisturbed, in-place) soil. The exposed ends of the sample rings will be covered with Teflon sheets and tight-fitting end caps.
- Sample labels indicating the sample identification number, the date/time of collection, and the sampler's initials will be affixed to the sample containers. Sample locations will be recorded on a Site Plan.
- Soil samples will be preserved in chilled ice chests maintained at approximately 4 degrees Celsius during transportation to the analytical laboratory. Samples will be transported to the laboratory under standard chain-of-custody protocol.
- Quality Assurance/Quality Control (QA/QC) sampling procedures will be adhered to during the field activities. These procedures will include frequent changes of disposable gloves during the sampling activities and decontamination of sampling equipment using Alconox® and deionized water rinses prior to each use.

8.3.2 Stockpiled Soil

Soil samples may be collected from stockpiled soil to assess the potential presence of COCs in the soil or to characterize apparently impacted or surplus soil for offsite disposal as a waste or potential offsite reuse. If the former, then discrete samples will be collected and handled as described above. If the latter, then waste characterization sampling will include collection of one discrete soil sample for each approximately 25 cubic yards of stockpiled soil and compositing to create 3- or 4-part composite soil samples for analysis. Stockpile soil samples will be collected from soil in different locations and depths within the stockpile.

8.3.3 Groundwater

If groundwater is encountered during excavation of COC-impacted soil, then groundwater samples should be collected and analyzed for COCs. Following are groundwater sampling procedures:

- Groundwater samples will be collected from ponded water in the trench (or in a holding tank if already pumped out of the trench) by using either a disposable polyethylene bailer with a hand pump or a peristaltic pump with disposable silicone tubing to extract and decant (or pump) the collected water directly into laboratory-provided containers.
- Sample labels indicating the sample identification number, the date/time of collection, and the sampler's initials will be affixed to the sample containers. Sample locations will be recorded on a Site Plan.
- Groundwater samples will be preserved in chilled ice chests maintained at approximately 4 degrees Celsius during transportation to the analytical laboratory. Samples will be transported to the laboratory under standard chain-of-custody protocol.
- Similar to soil sampling, the same QA/QC sampling procedures will be adhered to during groundwater sample collection.

8.4 Soil Transportation

COC-impacted soil that is deemed unsuitable for onsite or offsite reuse will be loaded into trucks for transport to an appropriate disposal facility. Waste characterization profiles will be submitted to the disposal facility in order to obtain their acceptance of the waste. Trucks used to transport soil offsite shall be equipped with cover tarps to minimize soil loss during transport. Soil shall be covered at all times except during loading and unloading activities. During loading activities, soil shall be sprayed liberally with water to minimize the generation of dust.

Loading and transport of soil that has been determined to be California- or Resource Conservation and Recovery Act (RCRA or “federal”)-hazardous waste criteria (based on waste characterization analysis data) will require use of an appropriately licensed Class A-HAZ subcontractor and appropriately OSHA 40-Hour Hazardous Waste Operations Training per Title 8 of the California Code of Regulations, Section 5192 and applicable annual update training.

COC-impacted soil will be transported to an offsite disposal facility using non-hazardous or hazardous waste manifests, as appropriate, based on stockpile characterization analytical data. Manifests and other records maintained by the trucking contractor will include the date and time of transport, approximate truckload volume, trucking company and driver information. Manifests will not be required for transport of non-impacted soil.

9.0 LABORATORY ANALYSES

Soil and groundwater samples shall be analyzed for the COCs including GRO, DRO, and ORO, BTEX, MTBE, and California Code of Regulations (CCR) Title 22 metals. Samples may be analyzed for other COCs (such as polycyclic aromatic hydrocarbons) based on the judgement of the environmental consultant or as required by the EDCMD or disposal facility. Samples will be analyzed by Advanced Technology Laboratories (ATL) of Signal Hill, California or California Laboratory Services (CLS) of Rancho Cordova, California. Both ATL and CLS are California-certified, Environmental Laboratory Accreditation Program laboratories and will conduct analysis according to industry-standard methods and QA/QC procedures. Sample transportation will follow standard chain-of-custody tracking procedures.

GRO, DRO, and ORO analysis will be performed using United States Environmental Protection Agency (USEPA) Method 8015B (M). BTEX and MTBE will be analyzed by USEPA Method 8260 and Title 22 metals analysis will be performed using USEPA Method 6010B. Other analyses will be performed using appropriate USEPA methods.

The laboratory will perform QA/QC procedures for each analytical method with specificity for each analyte listed in the test method's QA/QC. Laboratory QA/QC measures will generally include the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever is more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever is more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix, whichever is more frequent, with spike made at ten times the detection limit or at the analyte level.

The laboratory will provide written final laboratory reports that will document sample analytical results and associated units and detection limits, as well as a summary of QA/QC procedures and results and the original chain-of-custodies. Laboratory reports will be reviewed to confirm data completeness with respect to the chain-of-custody and test method assignments, holding times, and acceptable QA/QC procedures to verify that the data is of sufficient quality to satisfy project objectives.

A determination regarding the appropriate analytical turnaround time for analysis of soil samples will be made by supervisory field personnel and County personnel based on site conditions, the development project timeline, and other pertinent considerations. It is anticipated that samples will be analyzed on a standard 5- to 7-working-day turnaround.

10.0 SOIL SCREENING AND HAZARDOUS WASTE CRITERIA

The following table lists the screening criteria and hazardous waste criteria for the COCs at the Site that will be used to determine if soil is suitable for onsite reuse or offsite disposal options.

ANALYTE	SOIL SCREENING CRITERIA	HAZARDOUS WASTE CRITERIA ¹	
	ESLs ² , HERO Note 3 Screening Levels ³ , or RSLs ⁴	TTLC	STLC
<i>Petroleum Hydrocarbons and VOCs</i>			
GRO	430/2,000	---	---
DRO	260/1,200	---	---
ORO	12,000/18,000	---	---
Benzene	0.33/1.4	---	---
Toluene	1,100/5,300	---	---
Ethylbenzene	5.8/25	---	---
Xylenes	580/2,500	---	---
MTBE	0.028/210	---	---
<i>Title 22 Metals (CAM 17)</i>			
Antimony (Sb)	31/470	500	15
Arsenic (As)	0.11/0.36 ⁵	500	5
Barium (Ba)	15,000/220,000	10,000	100
Beryllium (Be)	16/230	75	0.75
Cadmium (Cd)	71/780	100	1

ANALYTE	SOIL SCREENING CRITERIA	HAZARDOUS WASTE CRITERIA ¹	
	ESLs ² , HERO Note 3 Screening Levels ³ , or RSLs ⁴	TTLc	STLC
Chromium (Cr)	120,000/1,800,000	2,500	5
Cobalt (Co)	23/350	8,000	80
Copper (Cu)	3,100/47,000	2,500	25
Lead (Pb)	80/320	1,000	5
Mercury (Hg)	1/4.4	20	0.2
Molybdenum (Mo)	390/5,800	3,500	350
Nickel (Ni)	820/11,000	2,000	20
Selenium (Se)	390/5,800	100	1
Silver (Ag)	390/5,800	500	5
Thallium (Tl)	0.78/12	700	7
Vanadium (V)	390/5,800	2,400	24
Zinc (Zn)	23,000/350,000	5,000	250
All criteria in mg/kg --- = No hazardous waste criteria 1. CCR Title 22, Division 4.5, Chapter 11, Article 3, Section 66261.24 2. ESLs = San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels for Residential/Commercial-Industrial, Rev. 1, January 2019. 3. HERO Note 3 screening levels = California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Note 3 screening levels for Residential/Commercial-Industrial, dated April 2019. 4. RSLs = United States Environmental Protection Agency Regional Screening Levels, dated May 2019. 5. Arsenic concentrations in soil will not be compared to the HERO Note 3 screening level, but to naturally occurring background concentrations ranging from 0.6 to 11 mg/kg (<i>Background Concentrations of Trace and Major Elements in California Soils</i> by University of California prepared by A.R. Bradford and others dated March 1996). CCR = California Code of Regulations TTLc = CCR Title 22 Total Threshold Limit Concentration STLC = CCR Title 22 Soluble Threshold Limit Concentration in milligrams per liter (waste extraction test)			

If COC concentrations in stockpile soil waste characterization samples are less than residential ESLs and hazardous waste criteria, then the soil may be reused on the Site in any area. If COC concentrations exceed residential ESLs, but are less than commercial/industrial ESLs and hazardous waste criteria, then it may be possible for the soil to be reused onsite beneath areas that will be paved with EDCEMD approval. If COC concentrations exceed commercial/industrial ESLs, but are less than hazardous waste criteria, then the soil may be disposed of as non-hazardous waste in an accepting Class II landfill. Lastly, if the COC concentrations in the soil samples exceed hazardous waste criteria, then the soil may be disposed of as hazardous waste in an accepting Class I landfill. Confirmation of the waste as either California-hazardous or RCRA-hazardous may be required by determining soluble COC concentrations using the Waste Extraction Test (WET) and Toxicity Characteristic Leaching Procedure (TCLP).

11.0 PROJECT DOCUMENTATION

Onsite personnel shall maintain daily field reports including a summary of project activities, excavation equipment and locations, PID monitoring results, soil stockpiling and transport, and soil sampling activities. Field report will include scaled drawings depicting the locations of excavations, soil stockpiles, and samples.

Laboratory analytical data shall be submitted to the City as soon as available to determine soil reuse or disposal options. Following completion of field activities and soil disposal (if any), a completion memorandum shall be prepared for submittal to the City.

The completion memorandum shall include the following:

- A summary of impacted soil encountered during construction excavation/grading, including (but not limited to) excavation limits and volumes, field observations and monitoring results, soil sampling procedures, soil stockpile management activities, health and safety procedures, etc.
- A summary of laboratory analysis results.
- Information with respect to soil stockpile data and final soil disposition.
- A Site Location Map and a scaled Site Plan that will indicate the locations of apparently impacted soil, soil stockpiles, and soil samples.
- Tabulated analytical data.
- Copies of laboratory reports and associated chain-of-custody documentation.
- Conclusions and recommendations for further action, if any.

12.0 REFERENCES

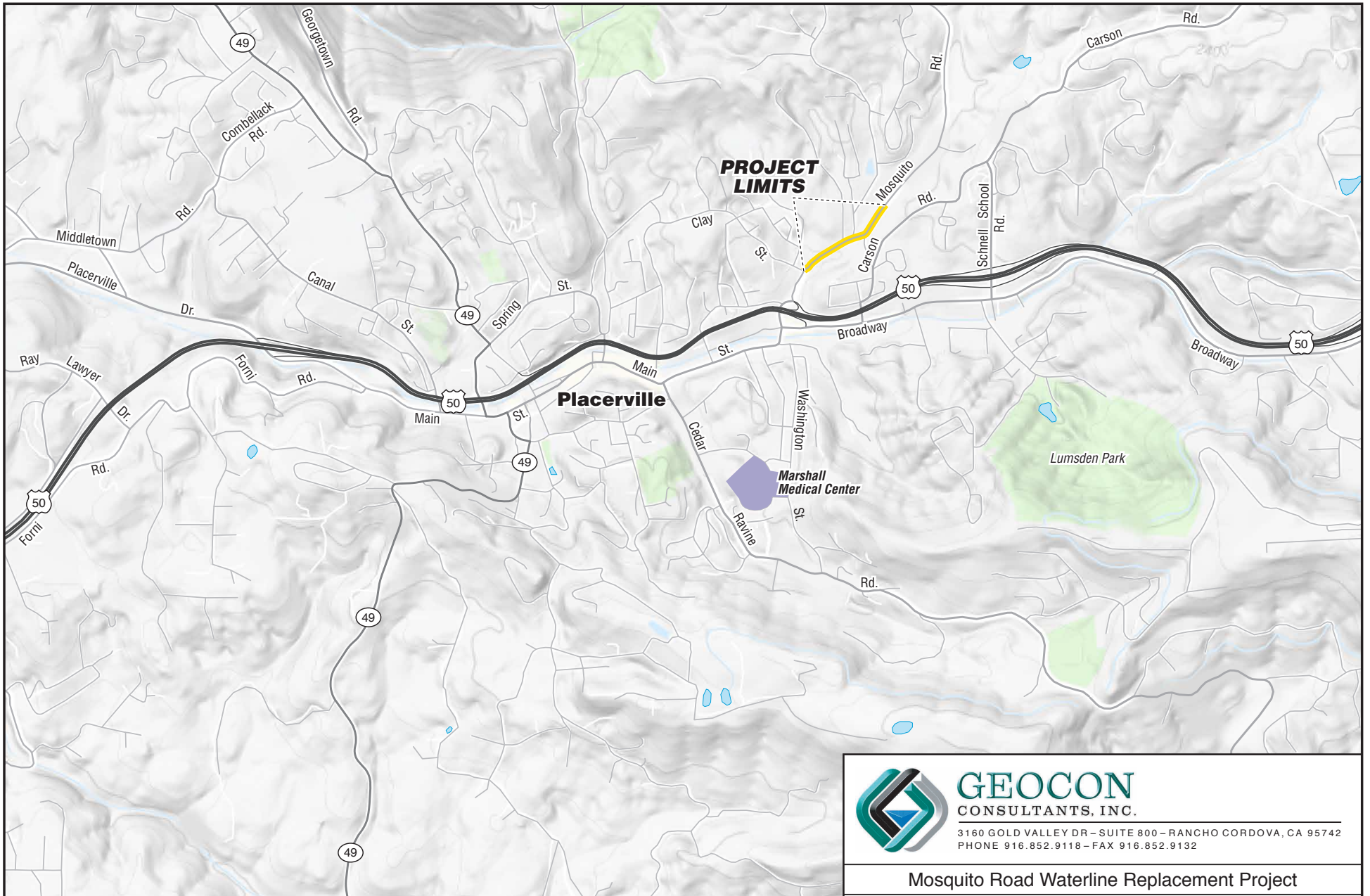
California Department of Toxic Substances Control, Office of Human and Ecological Risk, Human Health Risk Assessment Note 3, DTSC-Modified Screening Levels, April 2019.

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0 1/2
Scale in Miles



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Mosquito Road Waterline Replacement Project

Mosquito Road, Clay Street to 700 feet
Northeast of Dimity Lane, Placerville, California

VICINITY MAP

S1830-03-01

September 2019

Figure 1



LEGEND:

- Approximate Area of Potentially Contaminated Soil
- Approximate Pothole Location (no observed contamination)
- Approximate Pothole Location (observed petroleum contamination)
- Approximate Monitoring Well Location



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Mosquito Road Waterline Replacement Project

Mosquito Road, Clay Street to 700 feet
Northeast of Dimity Lane, Placerville, California

SITE PLAN

S1830-03-01

September 2019

Figure 2

APPENDIX

A

HEALTH AND SAFETY PLAN

SOIL EXCAVATION

MOSQUITO ROAD WATERLINE
REPLACEMENT
FROM CLAY STREET TO 700 FEET
NORTHEAST OF DIMITY LANE
PLACERVILLE, CALIFORNIA



GEOCON
CONSULTANTS, INC.

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED BY

GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DRIVE, SUITE 800
RANCHO CORDOVA, CALIFORNIA 95742

PROJECT NO. S1830-03-01

SEPTEMBER 2019

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HEALTH AND SAFETY PLAN SUMMARY

Site Name: Mosquito Road Waterline Replacement Project

Site Location/Address: Mosquito Road from Clay Street to 700 feet northeast of Dimity Lane (the Site) Placerville, California

Project Representatives:

- Project Manager Cell No.: **Jim Brake** **916-870-1180** - Cell No.
- Project Safety Officer: **Nicole Hastings-Bethel** **805-801-4998** - Cell No.
Geocon Office No.: **916-852-9118**
- Client Contact: **A. Cory Schiestel** **530-642-5557**

Scope:

- Soil sampling from soil generated during construction excavation
- Excavation confirmation soil sampling

Hazard Summary:

- Mechanical - material handling, slip/trip, struck-by injuries, fire-explosion, cave-in
- Earthwork – excavations
- Underground-Overhead Utilities
- Occupational Noise
- Biological – bites & stings, poison oak
- Thermal – Cold Stress and Strain
- Chemicals - Chemical – gasoline-, diesel-, oil-range organics (GRO, DRO, ORO), volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE), and Title 22 metals.

Control Summary:

- Site control; PPE – ANSI safety vests, hard hats, safety boot/shoes, safety glasses; air monitoring
- Site control, competent person, routine inspections
- Utility location, identification (USA)
- Hearing protection – ear plugs or muffs
- Site inspection & awareness; repellent
- Appropriate dress; shade/rest/fluids
- Engineering Controls/Isolation/PPE - safe (wet) sampling methods & work practices; protective gloves; sanitation.

Hospital Reference: Marshall Medical Center **530-622-1441**
1100 Marshall Way
Placerville, California 95667

Directions: **From the Site:** Head southwest on Mosquito Road toward Clay Street. Turn right onto Main Street and then turn left onto Turner Street. Turn right onto Crocker Street then turn left onto Marshall Way. Hospital will be on the right (see Site Location Map, Figure 1).

Emergency Assistance:

Fire/Police/Medical Assistance: **911**
Placerville Police Department: **530-642-5280** – Non-Emergency
El Dorado County Sheriff's: **530-621-5655** – Non-Emergency
Poison Control: **800-222-1222**

1.0 INTRODUCTION

This Health and Safety Plan (HSP) is a compilation of health and safety guidelines, policies and/or performance protocols that, when exercised, are intended to reduce or eliminate the potential for injury and exposure during the performance of the activities at the site described below. Conformance with its contents does not warrant that injuries or exposures will not occur.

This HSP is not a training tool and does not contain the degree of detail necessary to train an employee on the appropriate performance, approach and/or equipment-use protocols referenced, herein. Persons working on this project and referring to this HSP shall meet the minimum training requirements described in Section 2.2.

This HSP has been prepared to specifically support the field activities described herein. The provisions described herein apply to employees of Geocon Consultants, Inc. and its subcontractors, only. Representatives of the Client, Client-retained subcontractors, and representatives of state or local government agencies are expected to observe the safety rules and requirements established by their respective organizations, provided they do not conflict with this HSP. However, Geocon will not be responsible for enforcing the conditions of this HSP on these representatives. All Geocon personnel and subcontractors will review, and become familiar with the elements of the Plan prior to site work and have a copy of this HSP available when onsite.

The contents of this HSP are based on factors and conditions understood prior to the start of the field activities. If those factors and conditions change during the performance of the activities, including the service scope, or if conditions exist that were not considered in the preparation of this HSP, then such shall be brought to the immediate attention of the person approving this HSP, and the HSP shall be modified, accordingly. The date indicated in Section 8.0 of this document indicates the latest version of this HSP.

A pre-job conference will be held to delineate roles and responsibilities, discuss key elements of the Plan, and coordinate activities. This Plan is a "working document" to be used by affected personnel. The Plan may be modified at any time in accordance with Section 1.4 to adequately address changing conditions or previously unrecognized exposure hazards which may be encountered during the project. An updated, current copy of the Plan will be maintained at the project site during and be available to all affected personnel.

This Plan expires 6 months from the date of approval unless updated or amended; ref. T8 CCR §1532.1(e)(2)(E) "Written programs shall be revised and updated at least every 6 months."

1.1 Project Location and Description

Site Location/Address: Mosquito Road from Clay Street to 700 feet northeast of Dimity Lane (the Site) Placerville, California

1.2 Background

The City plans to replace an existing water pipeline that extends along the center of Mosquito Road and is concerned that construction excavation for the project will encounter petroleum-impacted soil. In May 2019, construction crews for the City encountered possible petroleum in soil along an approximately 450-foot-long section of existing pipeline adjacent to a Pacific Pride fueling station and Hunt and Sons Card Lock at 2891 Mosquito Road while excavating preliminary potholes to identify the depth and diameter of the existing pipeline. Crews reported “possible contamination” in three consecutive exploratory potholes. Apparent contamination was not observed in the outlying potholes.

1.3 Project Objectives

Petroleum-impacted soil may be encountered during replacement of the City waterline. Soil that has been identified as containing petroleum hydrocarbons will be segregated, stockpiled, and tested to determine onsite reuse or offsite disposal options. Excavated soil containing apparent indications of contamination (i.e. staining, odors, elevated photo-ionization detector [PID] readings, etc.) will be stockpiled separately on and covered with 10-mil polyethylene sheeting and secured pending laboratory analysis of composite soil samples for characterization.

If groundwater is encountered during excavation of impacted soil, then groundwater samples should be collected and analyzed for constituents of concerns.

1.4 Planned Scope of Services

- Soil excavation/grading observation;
- Field screen soil with a PID; and
- Soil sample collection

1.5 Schedule

Anticipated Period of Performance: FALL 2019/WINTER 2020

Anticipated Weather/Temperature: Cool temperatures and possible rain

2.0 ADMINISTRATIVE REQUIREMENTS/CONTROLS

2.1 Personnel

Personnel responsible for project safety include the Project Manager (PM), the Project Safety Officer (PSO), the Project Certified Industrial Hygienist (CIH), and participating project personnel.

2.1.1 Project Manager (PM)

The Project Manager has ultimate authority and responsibility for project Health and Safety. Accordingly, he has the responsibility to: develop and approve the HSP (or assign its development); audit compliance with the provisions of this HSP; suspend project activities or modify service practices for health and safety reasons; and, to dismiss from a project site individuals whose onsite conduct either endangers the health and/or safety of others or is judged not to comply with the provisions of the HSP.

The PM is also responsible for sharing/distributing the HSP to participating field personnel and to an authorized representative of each project subcontractor. The PM is responsible for implementing all provisions of the HSP and any applicable addenda. Implementation includes:

- Review and approval of the HSP requirements (if prepared by another project member);
- Presenting an overview of the provisions of the HSP with project participants;
- Providing the safety equipment specified herein;
- Collecting and submitting the requisite health and safety documentation (training rosters/certificates, air monitoring records (exposure assessments); site personnel logs, medical approvals), and copying them to the PSO, if appropriate;

Note: Monitoring and exposure assessment records will be maintained in accordance with the provisions of T8 CCR §§5214 – Inorganic Arsenic, 1532 – Cadmium, 1532.1 – Lead, and 1532.2 – Chromium VI, which is representative of T22 metals and 3204 Access to Employee Exposure and Medical Records.

- Designating/identifying a qualified project member as the PSO; and
- Reporting all Plan amendments to the Project CIH.

2.1.2 Project Safety Officer (PSO)

The designated PSO is responsible for assisting the PM with onsite implementation of the HSP. The PSO's responsibilities include:

- Maintaining project safety equipment supplies;
- Performing air monitoring, if and as specified;
- Directing decontamination procedures, as appropriate;
- Enforcing the provisions of this HSP;

- Directing emergency response operations until public emergency personnel arrive;
- Setting up Site Controls, if and as specified herein; and
- Reporting all incidents and infractions to the PM.

The PSO has the authority to suspend project activities any time he/she determines that the provisions of the HSP are inadequate to provide a service/project environment conducive to employee safety. Further, the PSO is to inform the PM of any individuals whose onsite actions jeopardize either their health and safety or the health and safety of others.

2.1.3 Project Certified Industrial Hygienist

The Project CIH provides industrial hygiene and safety technical support to the PM and PSO. In this capacity the Project CIH is responsible for:

- Provides training, as requested;
- Approving or recommending airborne sampling strategies and monitoring equipment;
- Providing technical support for the selection and use of Personal Protective Equipment (PPE); and,
- Providing arbitration on project health and safety issues.

2.1.4 Project Field Staff

All project personnel are responsible for:

- Complying with the provisions of this HSP;
- Performing services in a manner that is consistent with good health and safety practice; and
- Reading and being knowledgeable of the contents of this HSP.

2.2 Personnel Training

2.2.1 General Site Employees

Site employees will attend a project orientation prior to starting the project. The orientation will review all elements of the HSP, including: 1) the location of potential health and safety hazards on the site and 2) requirements of the HSP. The training will also address other Cal/OSHA requirements such as the Geocon Hazard Communication Program (T8 CCR §5194), including the potential hazards of exposure to VOCs, and the Injury and Illness Prevention Program (T8 CCR §3203).

Anticipated tasks to be performed under this HSP are considered Hazardous Waste Operations as defined by T8 CCR §5192 "Hazardous Waste Operations and Emergency Response." All project personnel will have successfully completed all applicable training requirements outlined in T8 CCR §5192(e), "Training" (40-hour Certificate and current annual Refresher Training).

2.2.2 Supervisors and Managers

Geocon employees whose responsibilities include onsite supervising or managing project tasks as defined under T8 CCR §5192(e)(4) shall hold a Supervisor Certificate documenting at least 8 additional hours of specialized hazardous waste operations management training.

2.2.3 Tailgate Safety Meetings

During the active field components of the project, the PM or designee will conduct regular (i.e., weekly or daily, as appropriate) “tailgate” safety meetings. These meetings will include information on the following subjects, as applicable:

- Changes to project scope;
- Recognized changes to site conditions;
- Review of safe work practices;
- On or off the project safety practices;
- Feedback from employees on hazards, safety suggestions, or concerns; and
- Recognition for compliance, good safety performance or attitude.

Attendance at the tailgate meetings is considered a part of each employee’s job responsibilities.

2.3 Medical Surveillance

Geocon and subcontractor employees if required to wear respiratory protection shall have a current medical evaluation and approval by a physician or other licensed health care professional (PLHCP). Medical evaluations for Geocon staff will be provided in accordance with the Geocon Respiratory Protective Equipment Program (ref. T8 CCR §5144(e) “Medical Evaluation”).

Project personnel are to arrive at the jobsite well rested and physically prepared to perform assigned tasks.

3.0 HAZARD AND CONTROL ANALYSIS

The following hazards were assessed to either exist, or have the potential to develop, during the performance of the project activities:

TASKS	HAZARDS							
	MECHANICAL	UNDERGROUND/O VERHEAD UTILITY	NOISE	BIOLOGICAL	RADIOLOGICAL	THERMAL	CHEMICAL	OTHER
Work-Related Driving	X							
Equipment Operation and Soil sampling	X		X	X		X	X	
Soil Excavation	X	X	X	X		X	X	

3.1 Safe Driving & Equipment Operation

Hundreds of workers are injured or die in job-related motor vehicle accidents annually. Motor vehicle accidents are one of the number-one causes of employee injuries and deaths. Most accidents can be avoided by practicing defensive driving. Geocon policies mandate that employees:

- Prepare themselves and their vehicle for the road before travel;
- Drive according to posted speed limits unless adverse conditions necessitate slower speeds;
- Never tailgate, employ the three (3) second rule in following vehicles;
- Fully comply with California Vehicle Code and other local laws and regulations regarding the use of cellular phones for communication while driving – talking on a cell phone and/or texting while driving is not only a significant hazard to yourself and others, but also violates Geocon H&S policy; and,
- Use practical driving procedures in cities, on the freeway, and in rural areas.

3.2 Mechanical Hazards

Type(s)/Source:

- Material Handling/Back Injury;
- Striking – slips, trips and falls;
- Struck-By Injuries – heavy equipment (backhoe or excavator); highway vehicle traffic; and
- Heavy equipment: Earthwork – trenching and excavation

Qualified Exposure Risk: Moderate to High

Hazard Control(s):

- Safe Lifting
- Project/Site Isolation – lane/shoulder closure traffic control; work methods; no work zone setups (lane closures) during inclement weather; adequate work area lighting when working at night
- PPE – ANSI approved Class II reflective safety vests during the day (Class III vests or ensembles at night); hard hats; safety-toe shoe or boot; safety glasses

3.2.1 Material Handling/Back Injury

Hazard: It is expected that field personnel will be required to lift heavy equipment and supplies and/or perform arduous tasks during this project. Accordingly, back injuries or physical strain may be caused by: routine lifting or one-time-only lifting; the weight of a lifted object; the frequency of lifting; bending, twisting, or rotating during lifting; prolonged sitting; exposure to vibrations; poor arch support in shoes; and, not stretching prior to physical activity. If the following “control” mechanisms are not exercised, debilitating back injury may occur.

Control(s): Before attempting to lift and carry an object, always test its weight first. If it is too heavy, get help. If possible, use mechanical lifting aids. If manageable, the proper method for lifting is:

- Get a good footing;
- Place feet about shoulder width apart;
- Bend knees to pick up load. Never bend from the waist;
- Keep back straight;
- Get a firm hold. Grasp opposite corners of the load, if possible;
- Keep the back as upright as possible;
- Lift gradually by straightening the legs - don't jerk the load;
- Keep the weight as close to the body as possible; and
- When changing directions, turn the entire body, including the feet. Don't twist the body.

If devices are used for handling materials manually (e.g., two-handed lifters, barrel ring clamps, hand trucks, wheelbarrows, etc.), wear protective equipment like gloves and safety shoes to minimize the potential of appendages becoming pinched or smashed between the load and stationary features. Also, avoid overloading the device.

3.2.2 "Striking" Injuries

Hazard: Injuries can, and often, result when a person (a kinetic mass) unexpectedly instigates contact with another kinetic mass. These occurrences typically result from inadvertent slips, trips and falls.

Control(s): To minimize risks of “slip/trip” hazards, personnel shall maintain a constant program of good housekeeping, keeping areas clear of trip hazards and wet and slippery surfaces. All hand tools shall be regularly secured and care shall be taken when entering areas where work is being performed above eye level.

3.2.3 Trauma Injuries – Struck by Vehicles or Heavy Equipment

Hazard: Injuries can, and often, result when workers are the unexpected receptor of contact with another kinetic mass. These occurrences typically result from the worker being struck by a dropped or collapsed mass, a moving piece of equipment, or more likely a moving vehicle.

Control(s): Engage the vehicle’s warning light bar whenever planning to pull off or exit the highway. When stopped or parked, continue use of the light bar. Employees/workers shall not exit the vehicle until they have successfully pulled off of the highway. In those instances where it is not possible to clear the shoulder or median, workers shall exit the vehicle on the side opposite the adjacent traffic flow; turn front wheels towards the roadway. Geocon employees will be required to wear hard hats, safety glasses and ANSI safety vests, and place safety cones at 10-yard intervals for a minimum of 30 yards (if achievable) from the left rear corner of the vehicle so they may be seen by adjacent traffic.

All project workers potentially exposed will be cautioned to maintain a constant awareness of traffic patterns/conditions throughout the duration of the field services.

3.3 Earthwork Excavation – Trenching Hazards

Hazard: Cave-in hazards may be created by an excavated area.

Controls: Soil excavation work will be conducted in accordance with T8 CCR Construction Safety Orders, Article 6, §§1540, 1541, and 1541.1 Appendices A through F.

The PM will identify the “Competent Person” responsible for excavation safety. The Competent Person will inspect the site prior to the start of work and as needed throughout the project. In addition, daily inspections of excavations, the adjacent areas, and protective systems will also be conducted for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions; e.g., excavation sidewall slopes will not be steeper than 45 degrees beneath the edges of the footings of load bearing members to reduce the potential for structural distress.

The Competent Person, as directed by the PSO will attempt to minimize cave-in hazards by restricting all entry into and around an excavation deemed greater in depth than 5 feet, unstable and/or unsafe. OSHA requires that each employee in an excavation be protected from cave-ins during an excavation by an adequate protective system designed in accordance with OSHA standards. Protective system options include proper sloping or benching of the sides of the excavation; supporting the sides of the

excavation with timber shoring or aluminum hydraulic shoring; or placing a shield between the side of the excavation and work area. The excavation contractor is free to choose the most practical design approach for any particular circumstance. Once an approach has been selected, however, the required performance criteria must be met by that system.

3.4 Underground – Overhead Utility Hazards

Type(s)/Source: Electric powerlines, water, sewer and gas (propane) utilities
Qualified Exposure Risk: Moderate
Primary “Control”: Isolation (contact USA, independent Utility Locator, Ground Penetrating Radar)

3.4.1 Underground Utilities

Type(s)/Source: Electrical, water, sewer, etc.
Qualified Exposure Risk: Moderate to high – soil excavation
Hazard Control: Isolation - contact USA, independent Utility Locator

Hazard: Contact with electrical current can cause shock, electrical burns, and/or be instantly fatal. If direct-push drill probe makes contact with electrical wires, it may or may not be insulated from the ground by the tires of the carrier. Under either circumstance, the human body, if it simultaneously comes in contact with the drill rig and the ground, will provide a conductor of the electricity to the ground.

Control(s): Demarcate all excavation locations, first. Contact Underground Service Alert (USA) (1-800-227-2600) and review as-built plans before performing any excavation activity. It is advised that a private utility locator be contacted to supplement USA’s demarcations, especially when the project is on private property. Soil intrusive work shall not proceed until all locating activities have been completed and fully documented in the site records. The initial site safety orientation meeting for all personnel onsite shall include a review of the underground utility locations and the location of the site map, showing the position of any underground utility lines. The site safety orientation shall include a site walkover of each marked utility or line.

Should a sub-surface condition be encountered that creates suspicion that there may be an unidentified underground line or utility, immediately cease work and secure the equipment. Work will not proceed until the potential risk or condition is resolved.

3.4.2 Overhead Utilities

Prior to site work involving hoisting or lifting operations using heavy equipment a site inspection will be conducted to identify potential overhead hazards such as power lines. A clearance of at least 10 feet will be maintained between overhead power lines and equipment booms (and hoists).

3.5 Occupational Noise Hazards

Vehicle traffic or equipment operated at sampling sites may present a noise hazard to employees. In all cases where the sound pressure levels may exceed a time-weighted average noise dose of 85 decibels (the Action Level), the PSO will evaluate exposures according to the Geocon Hearing Conservation Program (ref. T8 CCR §§5095-5100). Selection of hearing protection will be made in accordance with the Geocon Safety Equipment Guide. Only hearing protectors (ear plugs or muffs) with a Noise Reduction Rating of 20 dB, or higher, will be used. When worn, earmuffs will be donned in the “over the head” position with the hair pulled back from the sealing surface.

Note: In general, noise levels in excess of 85 dBA interfere with communication between two individuals speaking in a normal tone of voice at a distance of 3 feet from one another.

3.6 Biological Hazards

Type(s)/Source: Biting insects (mosquitoes, wasps, bees & ticks) and animals; poison oak.

Qualified Exposure Risk: Low; soil sampling on paved surface.

Primary Control(s):

- Site inspection & isolation/avoidance of poison oak;
- PPE (Gloves/boots/long-sleeve shirts);
- Insect repellent, barrier crèmes, wasp spray;
- Wet sampling methods in dry soils.

Hazard: Contact with insects and animals likely to be present at the site should be avoided. Stinging and biting insects, including bees, spiders, and ticks, can cause extreme discomfort and/or serious allergic responses. Insect bites are generally not dangerous, unless they are from a poisonous insect or mosquitoes potentially carrying West Nile and Zika virus.

The primary concern with animal bites and scratches is the potential for infection and/or rabies. Snake or scorpion bites can also be dangerous, but more from infection or trauma than the toxins injected by the snake or scorpion.

Control(s) – Biting Insects: Before beginning fieldwork each day, inspect the work area for the presence of standing water and inhabitant reptiles and take measures necessary to minimize the potential for contact. Specially prepared topical barriers and insect repellent containing approximately 50% DEET, or picaridin, IR3535, oil of lemon eucalyptus, or para-menthane-diol for long lasting protection for protecting exposed skin from biting insects. These products are commercially available and may minimize the potential for development of skin rashes and/or irritations due to such exposures; apply insect repellent sparingly to exposed skin.

Note: Avoid contacting plastic zippers or other plastic closure mechanisms on clothing, equipment bags, etc., with DEET containing crème which will cause these materials to degrade.

If you are allergic to bee or wasp stings, be sure to have the appropriate first aid available (e.g., an epi-pen) on the project. If you are stung, administer first aid and seek immediate medical attention.

Be sure a reptile or animal bite victim obtains medical attention quickly if a bite or scratch occurs, especially if there is a potential that it was poisonous. In the meantime, administer First Aid by scrubbing the wound with soap and water, and rinsing thoroughly under running water. Dry off and place a clean bandage on the wound. Victims of these bites should lie down and remain calm and motionless; cold packs should be applied and medical attention sought immediately.

Control(s) – Poison Oak: Contact with poison oak leaves or stems at any time of the year can cause an allergic response. Once a reaction occurs, repeated exposures further increase sensitivity. Conversely, long periods with no exposure will reduce an individual's susceptibility. In addition to direct contact with the plant, transmission of the allergen can occur by touching contaminated clothing, gloves, or tools. When poison oak is burned, the oils can disperse via the smoke particles. Breathing this smoke can cause severe respiratory irritation. Over the counter topical barriers such as Tecnu[®] can be applied to exposed skin for protection against poison oak.

After coming in contact with the allergen, the best way to prevent skin irritation is to pour a mild solvent such as isopropyl (rubbing) alcohol over the exposed area then wash with plenty of mild soap and/or Tecnu[®] and cold water; avoid using warm water, since it enhances the penetration of the oil. If isopropyl alcohol and soap is not available, use cold water by itself to help dilute the oil, to help minimize the harmful effects of the resin.

Perform these steps within five minutes of exposure. Even if it's too late to prevent the rash, washing the skin to remove excess plant oil/resin will keep the rash from spreading. Be sure to thoroughly wash your hands, since they serve as the major route for transferring the allergen to other parts of the body, especially the face.

Using only a small amount of water or disposable hand wipes is more likely to spread the toxin than remove it. You can use soap and/or Tecnu[®] but only if you also use copious amounts of water; ref. Attachment A – UC Davis Agriculture & Natural Resources.

3.7 Thermal Hazards – Cold Stress and Strain

Type(s)/Source:	Temperature-extreme environments resulting in cold stress
Qualified Exposure Risk:	Moderate to high depending on weather conditions; freezing rain or snow with daytime temperatures possibly below 45° F.

Primary “Control”: Habituate - Dress appropriately for the expected weather and temperature conditions – dress in warm layered clothing;
Establish appropriate work-rest regime in a warm shelter.

Hazard: Cold temperatures can result in injury to workers. Effects that require medical attention include frostbite and hypothermia.

- Frostbite is the most common injury resulting from exposure to cold. The extremities of the body (e.g., fingers, toes, ears, etc.) are most often affected. The signs of frostbite are:
 - o The skin turns white or grayish-yellow.
 - o Pain is sometimes felt early but subsides later. But often, there is no pain.
 - o The affected part feels intensely cold and numb.
- Hypothermia is characterized by shivering, numbness, drowsiness, muscular weakness and low internal body temperature, even when the body feels warm externally. This can lead to unconsciousness and eventual death.

Controls: The best control for frostbite and hypothermia is to avoid its occurrence by dressing warmly in layered clothing, and heeding the early warning signs of each, and seeking warm shelter before actual damage begins. In the event of either’s occurrence, remove yourself from the cold, immediately. In the case of frostbite, the affected areas need to be warmed as soon as possible, but gradually rather than quickly. This is best done by immersion in warm or room temperature (but not hot) water. In both cases seek medical assistance and treatment.

3.8 Chemical Hazards – Petroleum Hydrocarbons and Metals

The risk of significant airborne exposure to soil contaminants is considered to be low to moderate while performing the soil excavations, UST and associate, and soil characterization tasks required on this project. Soil excavation, handling and stockpiling methods (wet) and safe work practices to be employed will minimize the potential for significant exposures to airborne contaminants.

Detailed information regarding the physical description of petroleum hydrocarbons and toxic metals including health hazards, routes of entry into the body, signs and symptoms of exposure, and target organs, chemical and physical properties are available in Attachments B and C – Petroleum Hydrocarbons and Benzene, and Attachments D, E, F and G – T22 (CAM 17) Metals. The chemical guides for representative petroleum hydrocarbons and T22 (CAM) 17 metals are published by the National Institute for Occupational Safety and Health (NIOSH) Guide to Chemical Hazards; the Substance information sheets for Benzene, Arsenic, Cadmium and Lead are Appendices A of T8 CCR §§5218, 5214, 1532 and 1532.1 respectively.

3.8.1 Petroleum Hydrocarbons

Types/Source: Automotive fuel and lubricants - TPH: Total petroleum hydrocarbons

Exposure Route: See Attachment B - NIOSH Guides Petroleum Hydrocarbons

Exposure signs/symptoms: ref. Attachment B

Qualified Exposure Risk: Low; hydrocarbon impacted soil

Hazard Control(s):

- Isolation – site control
- Engineering Controls - work practices and safe sampling procedures
- Avoid contact with potentially contaminated water; follow sanitation and personal hygiene procedures outline in Section 4.3. In open work areas, unless there are conditions of a stagnant high-pressure system, ambient breezes are usually adequate to minimize potential exposure to hydrocarbon vapors.
- PPE – eye (safety glasses or goggles) and, hand protection (nitrile gloves)
- Sanitation – good personal hygiene

3.8.1.1 Gasoline

CHEMICAL NAME & CAS#	ROUTE OF ENTRY	PUBLISHED EXPOSURE LIMITS		
		CATEGORY	CONCENTRATION	SOURCE
Gasoline (8006-61-9)	Inhalation	PEL-TWA	300 ppm	Cal/OSHA
	Dermal	PEL-STEL	500 ppm	

3.8.1.2 Diesel Fuel

CHEMICAL NAME & CAS#	ROUTES OF ENTRY	PUBLISHED EXPOSURE LIMITS		
		CATEGORY	CONCENTRATION	SOURCE
Diesel fuel 68476-31-3	Inhalation Skin Absorption	TLV-TWA	100 mg/m ³ (Vapor & Aerosol)	ACGIH

3.8.1.3 Aromatic Petroleum Distillates

CHEMICAL NAME AND CAS#	ROUTES OF ENTRY	PUBLISHED EXPOSURE LIMITS		
		CATEGORY	CONCENTRATION	SOURCE
Ethylbenzene 100-41-4	Inhalation	PEL-TWA STEL	100 ppm 125 ppm	Cal/OSHA
Ethanol; Ethyl alcohol 64-17-5	Inhalation	PEL-TWA	1000 ppm	Cal/OSHA
Methyl tert-butyl ether (MTBE) 1634-04-4	Inhalation	PEL-TWA	40 ppm	Cal/OSHA
Naphthalene 91-20-3	Inhalation Skin Absorption	PEL-TWA TLV-TWA†	0.1 ppm 10 ppm	Cal/OSHA ACGIH†
Toluene 108-88-3	Inhalation Skin Absorption	PEL-TWA	50 ppm	Cal/OSHA

CHEMICAL NAME AND CAS#	ROUTES OF ENTRY	PUBLISHED EXPOSURE LIMITS		
		CATEGORY	CONCENTRATION	SOURCE
Xylenes 1330-20-7	Inhalation	PEL-TWA	100 ppm	Cal/OSHA
		STEL	150 ppm	

†ACGIH – American Conference of Governmental Industrial Hygienist; TLV – Threshold Limit Values for Chemical Substances

3.8.1.4 Benzene

T8 CCR GISO Article 110 Regulated Carcinogen §5218

Exposure Route: Inhalation, ingestion, skin contact; ref. Attachment C - T8 CCR §5218 Benzene - Appendix A

Hazard Control: ref. 3.8.1

CHEMICAL NAME & CAS#	ROUTES OF ENTRY	PUBLISHED EXPOSURE LIMITS		
		CATEGORY	CONCENTRATION	SOURCE
Benzene 71-73-2	Inhalation	PEL-TWA	1 ppm	Cal/OSHA
	Skin Absorption	STEL	5 ppm	

†ACGIH – American Conference of Governmental Industrial Hygienist; TLV - Threshold Limit Values for Chemical Substances 2017

3.8.2 T22 (CAM17) Toxic Metals

Type(s)/Source: Pollutants in soil, natural or man-made– former fuel additives
Title 22 (CAM 17) metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, zinc)

Exposure Route: Inhalation and ingestion; ref. Attachment D - T22 (CAM-17) Metals

Exposure signs/symptoms: See Attachment D (ref. NIOSH Pocket Guide to Chemical Hazards) and Attachments E, F and G.

Qualified Exposure Risk: Low to moderate

Hazard Controls:

- Isolation – site control
- Engineering Controls – Safe work practices and wet sampling procedures, Dampen dry soils prior to sampling to suppress dust hazards; ref. T8 CCR §5145
- Negative Exposure Assessment: Results of industrial hygiene monitoring of representative tasks and sampling procedures for aerially deposited inorganic lead (ADL), which is representative of potential exposure to CAM 17 metals, using these controls document exposures consistently below the 30 µg/m³ Action Level for airborne lead (ref. T8 CCR §1532.1(d)(5)(A)).
- PPE – eye (safety glasses or goggles) and, hand protection (leather and/or impermeable gloves)
- Sanitation – good personal hygiene; follow sanitation and personal hygiene procedures outline in Section 4.3.

CHEMICAL NAME & CAS #	ROUTES OF ENTRY	PUBLISHED EXPOSURE LIMITS		
		CATEGORY	CONCENTRATION	SOURCE
Title 22 Metals, Elemental, Inorganic Compounds	Inhalation, Ingestion, Dermal Contact	PEL/TLV [‡] -TWA	0.0005 to 5 mg/m ³	Cal/OSHA ACGIH [†]

‡PEL – Cal/OSHA Permissible Exposure Limit; TLV – ACGIH Threshold Limit Values; TWA – 8-hour time-weighted average concentration

3.8.2.1 Arsenic

T8 CCR GISO Article 110 Regulated Carcinogen §5214

Exposure Route: Inhalation, ingestion, skin contact; ref. Attachment E - T8 CCR §5214 Inorganic Arsenic - Appendix A

Hazard Control: ref. 3.8.1 and 2

CHEMICAL NAME & CAS #	ROUTES OF ENTRY	PUBLISHED EXPOSURE LIMITS		
		CATEGORY	CONCENTRATION	SOURCE
Arsenic 7440-38-2	Inhalation, Ingestion	PEL-TWA	10 µg/m ³	Cal/OSHA
		Action Level	5 µg/m ³	

3.8.2.2 Cadmium

T8 CCR GISO Article 110 Regulated Carcinogen §1532

Exposure Route: Inhalation, ingestion; ref. Attachment F - T8 CCR §1532 Cadmium - Appendix A

Hazard Control: ref. 3.8.1 and 2

CHEMICAL NAME & CAS #	ROUTES OF ENTRY	PUBLISHED EXPOSURE LIMITS		
		CATEGORY	CONCENTRATION	SOURCE
Cadmium 7440-43-9	Inhalation, Ingestion	PEL-TWA	5.0 µg/m ³	Cal/OSHA

3.8.2.3 Inorganic Lead

T8 CCR CSO §1532.1

Exposure Route: Inhalation and ingestion; ref. Attachment G - T8 CCR §1532.1 Lead - Appendix A

Hazard Controls: ref. 3.8.1 and 2

CHEMICAL NAME & CAS #	ROUTES OF ENTRY	PUBLISHED EXPOSURE LIMITS		
		CATEGORY	CONCENTRATION	SOURCE
Lead, Elemental & Inorganic Compounds 7439-92-1	Inhalation Ingestion	PEL-TWA	50 µg/m ³	Cal/OSHA
		Action Limit	30 µg/m ³	
Lead Chromate	Inhalation Ingestion	PEL-TWA as Pb	0.02 mg/m ³	
		PEL-TWA as Cr	0.005 mg/m ³	

4.0 GENERAL HEALTH AND SAFETY REQUIREMENTS

4.1 Air Monitoring – Petroleum Hydrocarbons

The necessity for evaluating potential airborne concentrations of vapors from petroleum hydrocarbons will be determined during the project by the PSO.

If necessary, based on observations, odors, or other information which becomes available during any potential tank removal activities, potential exposure to volatile organic hydrocarbons will be evaluated using direct-reading Combustible Gas Meter (GASTECH 402) equipped with a LEL, Oxygen, Carbon Monoxide and Hydrogen Sulfide monitor set with warning and alarm modes for field monitoring and measurements made in the operators breathing zone.

If necessary, again based on observations, odors, or other information which becomes available during soil sampling activities, potential exposure to volatile organic hydrocarbons will be evaluated using a direct-reading photoionization detector (PID) equipped with a 10.2 electron volt probe; measurements will be made at the top of the monitoring well and in the operators breathing zone.

All measurements shall be recorded in the field logbook. The frequency or need for continued sampling will be based on results from initial measurements. Justification for discontinuing measurements shall also be recorded in the field logbook.

The PSO will interpret monitoring data and upgrade or downgrade the level of protection during field activities according to the following guide:

Response Criteria For Fire Explosion Hazards in Tanks (measured at various levels within each tank)

READING	ACTION
Oxygen level less than 5 percent	tank safe for removal/cutting
LEL less than 10 percent	tank safe for removal/cutting
Greater than 4 percent O ₂ or 10 percent of the LEL	Stop Operations, add more dry ice Move Up-Wind

Response Criteria For Airborne Vapor Concentrations – Soil & Groundwater Sampling
Response Criteria For Airborne Vapor Concentrations
(measured at breathing zone level)

READING	LEVEL OF PROTECTION
0 ppm or Background (as measured up-wind of sampling location)	Level D
Background - 5 ppm above background	
> 5 ppm up to 10 ppm above background	Level D w/ continuous monitoring
>10 up to 300 ppm above background	Level C
>300 ppm above background	Stop Operations Move Up-Wind

Note: Readings exceeding 500 ppm or 10 percent of the LEL at the excavation site – suspend excavation and sampling activities and cover the site with a plastic membrane until conditions can be further assessed. If corrective action cannot be taken, site personnel must remain up-wind or move to a predetermined safe area and contact the Consulting CIH.

The Combustible Gas Meter (GASTECH 402) and the PID shall be calibrated each day before their use in the field operations, or more frequently as deemed necessary by the PSO. The instruments will be calibrated and maintained in accordance with the manufacturer's instructions. The calibration gas and the calibration readings (in both LEL and ppm) shall be recorded in the field log book.

Note: Combustible gas meter readings taken within oxygen deficient environments, i.e., spaces inerted with carbon dioxide, are not reliable. In addition, environments with high humidity can cause the GASTECH 402 and PID instruments to indicate lower organic vapor concentrations than may actually exist.

4.2 Air Monitoring – Metals

Industrial hygiene monitoring will not be performed for inorganic lead, arsenic, cadmium and other T22 metals sampling tasks being carried out for this project. Previous Negative Exposure Assessments for representative soil excavation, handling and sampling tasks, using similar controls document exposures consistently below the 30 µg/m³ Action Level for inorganic lead which is representative of potential exposure to airborne metals (ref. T8 CCR §1532.1(d)(5)(A)).

4.3 Personal Hygiene

The PSO will establish on-site sanitation procedures which may, depending on site tasks and conditions involve: hand-wash facilities including clean water and hand soap; waterless hand cleaner; sanitary wipes and clean towels at the project site.

All Geocon personnel, subcontractor employees, and Clients and their designees leaving the project site (work zones) will clean potential impacted soils from their footwear and follow personal hygiene procedures prior to leaving the project site. In addition, the following procedures will be followed to ensure worker protection against potential exposure through ingestion:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-in-mouth transfer and ingestion of material is prohibited in any area designated as being potentially impacted.
- Hands and face must be thoroughly washed upon leaving the work area, and before eating, drinking, or other non-project activities.
- Avoid unnecessary kneeling, sitting, leaning, or general contact with potentially impacted surfaces or with surfaces suspected of being potentially impacted by hazardous materials (i.e., puddles, mud, leachate, etc.).

4.4 Buddy System

Project personnel are to work with another person when performing sampling tasks; the client or a subcontractor's representative can serve as the second person while the work is being conducted in the field. Under no circumstances, other than completion of paper work at the end of the day, are field personnel to work alone at the site.

4.5 Work Zone Controls

The PSO will establish a work zone(s) around the general work area. The work zone will be established to limit the potential movement of hazardous materials or contaminated soils by workers or equipment. In general work zone will be delineated as follows:

Exclusion Zone: An area where the potential for contact with physical hazards and hazardous materials could occur. Depending on site characteristics (topography, etc.) and space available, an initial Exclusion Zone boundary will be established at a distance of 25 feet from the edges of the excavation.

- Contamination Reduction Zone: A transition area between the potentially impacted areas and the non-impacted area. Decontamination of personnel, equipment and samples, if necessary, will be conducted in this area in order to reduce the probability of contamination transfer to a non-impacted area. The Contamination Reduction Zone would be situated upwind of potentially impacted areas.
- Support Zone: Areas outside the Exclusion Zone, where administrative and project support functions are performed, including storage or staging of project materials. The Support Zone will also be situated upwind of the Exclusion Zone.

4.6 Code of Safe Practices

General safe work practices to be utilized by all project personnel are summarized below:

- All nonessential personnel will be kept clear of work areas.
- The use of entertainment and personal communication devices in the work zone shall not be allowed.

- Adequate signs and safety devices will be installed on equipment.
- All site employees will wear assigned personal protective equipment and level of protection as designated by the PSO.
- Eating, drinking, smoking, chewing gum or tobacco, or application of cosmetics is allowed in designated areas only.
- At a minimum, all personnel will wash with soap and water before lunch, using the restroom, and at the end of work. The face and hands shall be washed before eating, drinking, smoking, chewing gum, applying cosmetics, etc.
- Over-the-counter drugs and prescription medications must be reported to the PSO for clearance before an employee is allowed to work near drill rig or other heavy equipment.
- When portable electric tools and equipment are used, three-wire extension cords are required.
- Employees will advise their supervisors of any malfunctioning equipment immediately.
- An ongoing safety maintenance program for tools and equipment will be instituted. Inspections will occur on a regular basis to ensure parts are secure and intact. Defective equipment will be repaired or replaced.
- Appropriate engineering controls and equipment guards will be installed on tools and equipment. This includes seat belts & backup warning lights and signals.
- A list of names of personnel who are trained in CPR and first aid shall be available.
- Labels shall be placed on containers of hazardous materials.
- No one will work alone; the "buddy system" shall be implemented for all field work.
- Employees shall be trained to identify effects and symptoms of toxic exposure and report them immediately.
- Under no circumstances are Geocon personnel authorized to enter a Permit-Required Confined Space or an excavation or trench greater than 4 feet in depth.

5.0 PERSONAL PROTECTIVE EQUIPMENT

The implementation of engineering (hazard) controls as outlined in Section 3.8 is the preferred method of protecting personnel from potential airborne inhalation hazards related to this project or site. Nevertheless, PPE provides necessary protection from physical and mechanical hazards, particularly when engineering controls such as barriers and equipment guarding are not feasible or cannot adequately eliminate exposure risks. The required use of PPE is intended to provide protection for on-site personnel from operational hazards that cannot be controlled through other safety procedures or work practices.

PPE required to be onsite for each worker during this project will include:

☒ Hard Hat (without face Shield)	☒ Safety Glasses
☒ Synthetic/Leather Safety Boots/Shoes	☒ Disposable inner gloves (for sample handling)
☒ Chem. Resistant Boots	☒ Chem. Resistant gloves
☒ Synthetic/Leather Gloves	☐ Air-Purifying Respirator
☒ Hearing Protection – Plugs or Muffs	☐ APR Cartridges
☒ ANSI Class II/III Safety Vest	☐ Tyvek coveralls
☐ Other: _____	

Level D Protection will be employed by onsite personnel and will include varying levels of eye, head, body, hand, foot, and hearing protection. Only ANSI approved PPE and NIOSH approved respirators will be assigned for use. The use applications for this equipment are summarized in the following matrix. Specific procedures are further described below.

TASKS	PPE												
	Hard Hat	Safety Glasses	Leather Boots	Chemical Resistant Boots	Disposable Inner Gloves	Chemical Resistant Gloves	Leather Gloves	Ear Plugs/Muffs	Air-Purifying Respirator (Half-/Full Face)	APR Cartridges	ANSI Class II/III Vest	Tyvek Coveralls	Other
Soil excavation and handling	X	X	X				X	X			X		
Soil sampling	X	X	X		X	X		X			X		

5.1 Respiratory Protection

Respiratory protection will not be required during excavation and/or tank removal, or while conducting soil or groundwater (if encountered during excavation) sampling activities. The PSO will determine the need for upgrading the level of protection from “D” to “C”.

If it is determined that respiratory protection is required, personnel shall don a full facepiece or half-mask air-purifying respirator fitted with a combination organic vapor (Black), or organic vapor-acid gas (Yellow) and HEPA (P100, Magenta) cartridge.

5.2 PPE – Level D Protection

The protective equipment to be donned by personnel working in the Exclusion Zone includes:

- Body Protection: Body protection shall include the use of "work clothing," including long pants and long- or short-sleeved shirts, and Class II/III ANSI approve safety vest.
- Head Protection: Non-metallic hard hats shall be worn by all personnel; ref. T8 CCR §§1514 & 3385 Head Protection.
- Hearing Protection: Hearing protection shall include the use of foam ear inserts or muffs; ref. T8 CCR §5098.
- Eye & Face Protection: Protective eye wear (i.e., safety glasses) shall be worn by personnel working in direct proximity to operating heavy equipment and highway traffic; ref. T8 CCR §§1514 & 3385 Eye Protection.
- Hand Protection: Appropriate hand protection shall be required for employees whose work involves unusual and excessive exposure of hands to cuts capable of causing injury or impairments; ref. T8 CCR §§1514 & 3384 Hand Protection.
- Foot Protection: foot protection, such as steel toed shoes or boots shall be required for employees who are exposed to foot injuries from electrical hazards, falling objects, or crushing or penetrating actions; ref. T8 CCR §§1514 & 3385 Foot Protection.

5.3 PPE – Level C Protection

Back-Up Respiratory Protection: Level C respiratory protection shall be available as back-up and will include NIOSH approved half-face or full-face, air-purifying respirators outlined in Section 5.1.

These levels may be up-graded by anyone, with prior notification to management personnel, but shall only be downgraded upon approval by either the PSO or the PM.

5.4 Miscellaneous Safety Equipment

Additional protective equipment to be available to personnel working at the site is listed as follows:

- Communication: Portable radios/walkie talkies or cell phones shall accompany all personnel,
- A minimum 20 pound (B. C. Rated) fire extinguisher will be located onsite,
- First Aid Kit,
- Emergency Spill Kit,
- Self-contained Portable Eyewash Equipment (ref. Sections 5, 7, or 9 of ANSI Z358.1-1981), and
- Water source to suppress fugitive dust emissions.

6.0 DECONTAMINATION

Decontamination procedures will be tailored to the specific hazards of the site and may vary in complexity and number of steps, depending on the level of hazard and employee exposure to potential hazards. Decontamination procedures and PPE decontamination methods will vary depending upon the extent of potentially impacted soils required to be handled. Decontamination methods and procedures will be routinely evaluated, as necessary, to assure that employees are not exposed to hazards by reusing PPE.

The primary principle in consideration of decontamination procedures is: Avoid unnecessary contamination of PPE and Sampling Equipment. The following decontamination guide for construction materials, equipment, and PPE have been developed with the intent of reducing the potential for the transfer of hazardous chemicals outside the Exclusion Zone.

6.1 Construction Materials and Equipment

Only authorized, trained and 40-hour OSHA certified personnel, equipment and materials necessary for work in the exclusion zone will be allowed in the exclusion zone. The exterior surfaces of excavation equipment, including buckets, tires and/or tracks will be scraped with shovels to remove substantial deposits of potentially contaminated soil prior to being rinsed with water.

Shovels, hand tools, and other equipment will also undergo gross decontamination to remove any potentially contaminated soils. Soil, dust, debris, water and decontamination rinseate will be controlled to prevent entering nearby storm drains, creeks, or streams.

Decontamination of soil sampling equipment shall include washing with a solution of TSP, Alconox[®], or Liquinox[®] and water followed by a double rinse of deionized water between samples and before vacating the work area.

6.2 Sampling Equipment Decontamination

Decontamination of soil sampling equipment shall include washing with a solution of TSP, Alconox[®], or Liquinox[®] and water followed by a double rinse of deionized water between borings and before vacating the work area.

6.3 PPE Decontamination

The PSO will determine the necessity for and level of decontamination appropriate to this project. Decontamination of PPE may be accomplished by personnel passing through separate stations or stages to reduce and remove contaminated clothing and equipment. Decontamination stations may include the following procedures listed sequentially below.

Stage No. 1: Segregated Equipment Drop - Equipment and consumables that require either disposal or special handling (e.g., special and/or equipment decontamination) shall remain in this area and be decontaminated, if appropriate, or disposed of with the excavated materials or other potentially impacted materials.

Stage No. 2: PPE Decontamination - PPE that has been potentially impacted will be placed in 55-gallon steel drums or plastic liners and disposed of with the other solid wastes generated.

Stage No. 3: General Field Wash - Personnel shall wash and rinse face and hands with soap and water before leaving the site and/or eating. If changing of clothing is necessary, it shall be done at this time. Respirator decontamination, if required, shall include a wash with soap and water followed by a clean water rinse.

7.0 EMERGENCY RESPONSE PROCEDURES

7.1 Emergency Response/Equipment

As a minimum, the project shall have the following equipment available during all activities:

- Communication - portable radios (walkie talkies) or cell phones shall accompany all personnel.
- An emergency first aid kit will be available at the support zone at all times.
- Two 30-pound (B. C. Rated) fire extinguishers will be available at the support zone at all times.
- A vehicle horn shall be used as a non-verbal communication device and shall accompany the field team. One long blast of the horn shall signify immediate evacuation. Two short blasts of the horn shall signify a request for assistance.
- Emergency (portable) eyewash - Filled with either manufacturer's solution or DI water and shall accompany the first aid kit at all times (ref. Sections 5, 7, or 9 of ANSI Z358.1-1981).
- Copious amounts of potable water - Shall be readily available for both drinking purposes and for personal hygiene purposes (e.g., washing, rinsing, and cooling of face and body, etc.). A minimum of 2 gallons of drinking water per onsite worker shall be available before work begins, or a drinking water source must be immediately available at the project site; ref. Section 3.7.
- Emergency references (e.g., nearest phone, emergency phone numbers and services, etc., as summarized on the summary Sheet) - Shall accompany the first aid kit and shall be available at the support zone.
- A vehicle easily accessible for emergency transport.
- Emergency Response Spill Kit consisting of absorbents, plastic liners, rags, shovels, push brooms, Tyvek™ suits, gloves, half-face respirators and cartridges.

7.2 Physical Injury

In the event of an accident resulting in physical injury, call emergency service personnel immediately and perform first aid commensurate with training and seriousness of the injury. Severely injured

personnel are to be transported only by emergency service personnel and/or by ambulance personnel, unless a life-threatening condition is judged to exist that must be addressed immediately. At the hospital, a physician's attention is mandatory regardless of how serious the injury appears.

The PM is to be notified by the PSO, as soon after the injury as practical, regarding the nature of the accident. A written report is also to be prepared and submitted by the PSO to the PM within 24 hours of the accident. If the PSO is unable to make the report (due to injury) an individual designated by the PM shall make the report.

7.3 Catastrophic Event

In the event of a catastrophic event (e.g., severe personal injury, fire, explosion, and/or property damage), notify the fire/safety and rescue department immediately by dialing 911.

Any accident involving serious injury will require suspension of site activities until the PM (or designee) has completed a review of the events and site conditions and authorized work to resume.

The PM (or designee) will notify the nearest Cal/OSHA District Office immediately (within 8-hours) by phone or fax upon learning of a death or serious injury:

Sacramento District Office
2424 Arden Way, Suite 165
Sacramento, California 95825

Tel: 916-263-2800
Fax: 916-263-2798
email: DOSHSAC@dir.ca.gov

7.4 Emergency Telephone Numbers

Fire/Police/Medical Assistance:	911
Placerville Police Department:	530-642-5280 – Non-Emergency
El Dorado County Sheriff's:	530-621-5655 – Non-Emergency
Poison Control:	800-222-1222

Other phone numbers may be available or required for emergency response at specific sites. Check with onsite representatives before mobilizing to the job site.

7.5 Project Site Address

Site Location/Address: Mosquito Road from Clay Street to 700 feet northeast of Dimity Lane (the Site) Placerville, California

7.6 Hospital Address and Route

Hospital Reference: Marshall Medical Center **530-622-1441**
1100 Marshall Way
Placerville, California 95667

Directions: **From the Site:** Head southwest on Mosquito Road toward Clay Street. Turn right onto Main Street and then turn left onto Turner Street. Turn right onto Crocker Street then turn left onto Marshall Way. Hospital will be on the right (see Site Location Map, Figure 1).

8.0 PLAN APPROVAL

The undersigned has reviewed and approved this Health and Safety Plan prepared for the 700 16th Street Mixed-Use Residential Building Project in Sacramento, California, as described herein.

Nicole Hastings-Bethel
Project Safety Officer

September 11, 2019
Date

Jim Brake, PG
Project Manager



September 11, 2019
Date

The following personnel, including subcontractors involved with the project activities have reviewed, or received a copy of this Plan and Attachments A, B, C, D, E, F and G, and agree to follow the health and safety procedures described herein.

Print Name	Title	Signature	Date

APPENDIX

A

Poison oak, also known as western poison oak (*Toxicodendron diversilobum*), is native to western North America with a distribution extending from British Columbia to the Baja California peninsula. In Washington and Oregon, poison oak is found mainly in the western regions of the states. In California it is widespread and grows in a wide range of habitats from sea level to the 5,000-foot elevation and in areas including open woodland, grassy hillsides, coniferous forests, and open chaparral.

IDENTIFICATION:

Poison oak is a woody shrub or vine that loses its leaves in winter. In open areas under full sunlight, it forms a dense, leafy shrub usually 1 to 6 feet high. In shaded areas, such as in coastal redwoods and oak woodlands, it grows as a climbing vine, supporting itself on other vegetation or upright objects using its aerial roots.

Leaves normally consist of three leaflets with the stalk of the central leaflet being longer than those of the other two; however, leaves occasionally are comprised of 5, 7, or 9 leaflets. Leaves of true oaks, which are superficially similar, grow singly, not in groups. Poison oak leaves alternate on the stem. Each leaflet is 1 to 4 inches long and smooth with toothed or somewhat lobed edges. The diversity in leaf size and shape accounts for the Latin term *diversilobum* in the species name. The surface of the leaves can be glossy or dull and sometimes even somewhat hairy, especially on the lower surface.

In spring, poison oak produces small, white-green flowers at the point where leaves attach to the stem. Whitish-green, round fruit form in late summer. In early spring the young leaves are green or sometimes light red. In late spring and summer the foliage is glossy green and later turns attractive shades of orange and red.

IMPACT:

Poison oak thrives along roadsides and other areas where established vegetation is disturbed, in uncultivated fields, and on abandoned land. It also is a problem in wood lots, Christmas tree plantations, rangeland, and recreation areas. While it can reduce optimal grazing area in rangeland or pastures, the primary concern associated with poison oak is the allergic reaction it causes in many people.

All members of the genus *Toxicodendron*—which includes poison oak, poison ivy, and poison sumac—cause allergic contact dermatitis. About 2 million cases of skin poisoning are reported in the United States each year, primarily from these three species. In California, the number of working hours lost as a result of dermatitis from poison oak makes it the most hazardous plant in the state.

Contact with poison oak leaves or stems at any time of the year can cause an allergic response. When the allergen contacts the skin surface of sensitive individuals, the surrounding cells rapidly absorb it. Within 1 to 6 days, skin irritation and itching will be followed by water blisters, which can exude serum. Contrary to popular belief, the exuded serum does not contain the allergen and does not transmit the rash to other regions of the body or to other individuals. The dermatitis rarely lasts more than 10 days. Only about 15 to 20% of the population is immune to the allergenic reaction caused by poison oak and show no symptoms when exposed to the plant. Once a reaction occurs, repeated exposures further increase sensitivity. Conversely, long periods with no exposure will reduce an individual's susceptibility. Animals with fur usually don't suffer skin irritation, although a dog can develop symptoms on its nose or underbelly. Livestock can graze on the tender foliage with no adverse effects.

In addition to direct contact with the plant, transmission of the allergen can occur by touching contaminated clothing, gloves, tools, or animals, particularly pets. When poison oak is burned, the oils can disperse via the smoke particles. Breathing this smoke can cause severe respiratory irritation.

After coming in contact with the allergen, the best way to prevent skin irritation is to pour a mild solvent such as isopropyl (rubbing) alcohol over the exposed area then wash with plenty of cold water; avoid using warm water, since it enhances the penetration of the oil. If isopropyl alcohol is not available, use cold water by itself to help dilute the oil, so it no longer is as harmful.

Perform these steps within five minutes of exposure. Even if it's too late to prevent the rash, washing the skin to remove excess plant oil will keep the rash from spreading. Be sure to thoroughly wash your hands, since they serve as the major route for transferring the allergen to other parts of the body, especially the face.

Using only a small amount of water or disposable hand wipes is more likely to spread the toxin than remove it. You can use soap but only if you also use copious amounts of water.

If you wash with isopropyl alcohol or soap, be sure you are done working outside for the day, since these products also will remove your skin's protective oils, which help repel the plant toxin; your body will not regenerate these protective oils for 3 to 6 hours. If re-exposure could occur within 6 hours, you will have better results washing with lots of water.

The product Tecnu, which most drug stores sell, will remove the poison oak oil from your skin. You should wash the contacted areas within 2 to 8 hours after exposure. You also can use Tecnu to decontaminate laundry, pets, and tools.

APPENDIX

B

Ethyl benzene		Formula: CH ₃ CH ₂ C ₆ H ₅	CAS#: 100-41-4	RTECS#: DA0700000	IDLH: 800 ppm [10%LEL]
Conversion: 1 ppm = 4.34 mg/m ³		DOT: 1175 130			
Synonyms/Trade Names: Ethylbenzol, Phenylethane					
Exposure Limits: NIOSH REL: TWA 100 ppm (435 mg/m ³) ST 125 ppm (545 mg/m ³) OSHA PEL†: TWA 100 ppm (435 mg/m ³)				Measurement Methods (see Table 1): NIOSH 1501 OSHA 7, 1002	
Physical Description: Colorless liquid with an aromatic odor.					
Chemical & Physical Properties: MW: 106.2 BP: 277°F Sol: 0.01% FLP: 55°F IP: 8.76 eV Sp.Gr: 0.87 VP: 7 mmHg FRZ: -139°F UEL: 6.7% LEL: 0.8% Class IB Flammable Liquid		Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 800 ppm: CcrOv*/GmFOv/PapOv*/ Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
Incompatibilities and Reactivities: Strong oxidizers					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, muc memb; head; derm; narco, coma TO: Eyes, skin, resp sys, CNS			First Aid (see Table 6): Eye: Irr immed Skin: Water flush prompt Breath: Resp support Swallow: Medical attention immed		

Ethyl alcohol		Formula: CH ₃ CH ₂ OH	CAS#: 64-17-5	RTECS#: KQ6300000	IDLH: 3300 ppm [10%LEL]
Conversion: 1 ppm = 1.89 mg/m ³		DOT: 1170 127			
Synonyms/Trade Names: Alcohol, Cologne spirit, Ethanol, EtOH, Grain alcohol					
Exposure Limits: NIOSH REL: TWA 1000 ppm (1900 mg/m ³) OSHA PEL: TWA 1000 ppm (1900 mg/m ³)				Measurement Methods (see Table 1): NIOSH 1400 OSHA 100	
Physical Description: Clear, colorless liquid with a weak, ethereal, vinous odor.					
Chemical & Physical Properties: MW: 46.1 BP: 173°F Sol: Miscible F.L.P: 55°F IP: 10.47 eV Sp.Gr: 0.79 VP: 44 mmHg FRZ: -173°F UEL: 19% LEL: 3.3% Class IB Flammable Liquid		Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 3300 ppm: Sa/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: ScbaE	
Incompatibilities and Reactivities: Strong oxidizers, potassium dioxide, bromine pentafluoride, acetyl bromide, acetyl chloride, platinum, sodium					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose; head, drow, lass, narco; cough; liver damage; anemia; repro, terato effects TO: Eyes, skin, resp sys, CNS, liver, blood, repro sys			First Aid (see Table 6): Eye: Irr immed Skin: Water flush prompt Breath: Fresh air Swallow: Medical attention immed		

Gasoline		Formula:	CAS#:	RTECS#:	IDLH:
Conversion: 1 ppm = 4.5 mg/m ³ (approx)		DOT: 1203 128			
Synonyms/Trade Names: Motor fuel, Motor spirits, Natural gasoline, Petrol [Note: A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]					
Exposure Limits: NIOSH REL: Ca See Appendix A OSHA PEL†: none				Measurement Methods (see Table 1): OSHA PV2028	
Physical Description: Clear liquid with a characteristic odor.					
Chemical & Physical Properties: MW: 110 (approx) BP: 102°F Sol: Insoluble F.I.P.: -45°F IP: ? Sp.Gr(60°F): 0.72-0.76 VP: 38-300 mmHg FRZ: ? UEL: 7.6% LEL: 1.4% Class IB Flammable Liquid		Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R. Provide: Eyewash Quick drench		Respirator Recommendations (see Tables 3 and 4): NIOSH ¥: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
Incompatibilities and Reactivities: Strong oxidizers such as peroxides, nitric acid & perchlorates					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, muc memb; derm; head, lass, blurred vision, dizz, slurred speech, conf, convuls; chemical pneu (aspir liquid); possible liver, kidney damage; [carc] TO: Eyes, skin, resp sys, CNS, liver, kidneys [in animals: liver & kidney cancer]			First Aid (see Table 6): Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed		

Naphthalene		Formula: C ₁₀ H ₈	CAS#: 91-20-3	RTECS#: QJ0525000	IDLH: 250 ppm
Conversion: 1 ppm = 5.24 mg/m ³		DOT: 1334 133 (crude or refined); 2304 133 (molten)			
Synonyms/Trade Names: Naphthalin, Tar camphor, White tar					
Exposure Limits: NIOSH REL: TWA 10 ppm (50 mg/m ³) ST 15 ppm (75 mg/m ³) OSHA PEL†: TWA 10 ppm (50 mg/m ³)				Measurement Methods (see Table 1): NIOSH 1501 OSHA 35	
Physical Description: Colorless to brown solid with an odor of mothballs. [Note: Shipped as a molten solid.]					
Chemical & Physical Properties: MW: 128.2 BP: 424°F Sol: 0.003% F.I.P.: 174°F IP: 8.12 eV Sp.Gr: 1.15 VP: 0.08 mmHg MLT: 176°F UEL: 5.9% LEL: 0.9% Combustible Solid, but will take some effort to ignite.		Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 100 ppm: CcrOv95*/Sa* 250 ppm: Sa:Cf*/CcrFOv100/ PapOvHie*/ ScbaF/SaF §: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba Escape: GmFOv100/ScbaE	
Incompatibilities and Reactivities: Strong oxidizers, chromic anhydride					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes; head, conf, excitement, mal; nau, vomit, abdom pain; irrit bladder; profuse sweat; jaun; hema, renal shutdown; derm, optical neuritis, corn damage TO: Eyes, skin, blood, liver, kidneys, CNS			First Aid (see Table 6): Eye: Irr immed Skin: Molten flush immed/sol-liq soap wash prompt Breath: Resp support Swallow: Medical attention immed		

Stoddard solvent		Formula:	CAS#:	RTECS#:	IDLH:
			8052-41-3	WJ8925000	20,000 mg/m ³
Conversion:		DOT: 1268 128 (petroleum distillates, n.o.s.)			
Synonyms/Trade Names: Dry cleaning safety solvent, Mineral spirits, Petroleum solvent, Spotting naphtha [Note: A refined petroleum solvent with a flash point of 102-110°F, boiling point of 309-396°F, and containing >65% C ₁₀ or higher hydrocarbons.]					
Exposure Limits: NIOSH REL: TWA 350 mg/m ³ C 1800 mg/m ³ [15-minute] OSHA PEL†: TWA 500 ppm (2900 mg/m ³)				Measurement Methods (see Table 1): NIOSH 1550	
Physical Description: Colorless liquid with a kerosene-like odor.					
Chemical & Physical Properties: MW: Varies BP: 309-396°F Sol: Insoluble F.L.P: 102-110°F IP: ? Sp.Gr: 0.78 VP: ? FRZ: ? UEL: ? LEL: ? Class II Combustible Liquid		Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		Respirator Recommendations (see Tables 3 and 4): NIOSH 3500 mg/m ³ : CcrOv*/Sa* 8750 mg/m ³ : Sa:Cf*/PapOv* 17,500 mg/m ³ : CcrFOv/GmFOv/PapTOv*/ ScbaF/SaF 20,000 mg/m ³ : SaF: Pd, Pp §: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
Incompatibilities and Reactivities: Strong oxidizers					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, nose, throat; dizz; derm; chemical pneu (aspir liquid); in animals: kidney damage TO: Eyes, skin, resp sys, CNS, kidneys			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

Toluene	Formula: C ₆ H ₅ CH ₃	CAS#: 108-88-3	RTECS#: XS5250000	IDLH: 500 ppm
Conversion: 1 ppm = 3.77 mg/m ³		DOT: 1294 130		
Synonyms/Trade Names: Methyl benzene, Methyl benzol, Phenyl methane, Toluol				
Exposure Limits: NIOSH REL: TWA 100 ppm (375 mg/m ³) ST 150 ppm (560 mg/m ³) OSHA PEL†: TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)			Measurement Methods (see Table 1): NIOSH 1500, 1501, 3800, 4000 OSHA 111	
Physical Description: Colorless liquid with a sweet, pungent, benzene-like odor.				
Chemical & Physical Properties: MW: 92.1 BP: 232°F Sol(74°F): 0.07% F.L.P: 40°F IP: 8.82 eV Sp.Gr: 0.87 VP: 21 mmHg FRZ: -139°F UEL: 7.1% LEL: 1.1% Class IB Flammable Liquid	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		Respirator Recommendations (see Tables 3 and 4): NIOSH 500 ppm: CcrOv*/PapRov*/ GmFOv/Sa*/ScbaF §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFOv/ScbaE	
Incompatibilities and Reactivities: Strong oxidizers				
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, nose; lass, conf, euph, dizz, head; dilated pupils, lac; anxi, musc ftg, insom; pares; derm; liver, kidney damage TO: Eyes, skin, resp sys, CNS, liver, kidneys			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

VM & P Naphtha		Formula:	CAS#:	RTECS#:	IDLH:
			8032-32-4	OI6180000	N.D.
Conversion:		DOT: 1268 128 (petroleum distillates, n.o.s.)			
Synonyms/Trade Names: Ligroin, Painters naphtha, Petroleum ether, Petroleum spirit, Refined solvent naphtha, Varnish makers' & painters' naphtha					
Exposure Limits: NIOSH REL: TWA 350 mg/m ³ C 1800 mg/m ³ [15-minute] OSHA PEL†: none				Measurement Methods (see Table 1): NIOSH 1550 OSHA 48	
Physical Description: Clear to yellowish liquid with a pleasant, aromatic odor.					
Chemical & Physical Properties: MW: 87-114 (approx) BP: 203-320°F Sol: Insoluble F.I.P.: 20-55°F IP: ? Sp.Gr(60°F): 0.73-0.76 VP: 2-20 mmHg FRZ: ? UEL: 6.0% LEL: 1.2% Class IB Flammable Liquid	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		Respirator Recommendations (see Tables 3 and 4): NIOSH 3500 mg/m ³ : CcrOv/Sa 8750 mg/m ³ : Sa:Cf/PapOv 17,500 mg/m ³ : CcrFOv/GmFOv/PaprTOv/ ScbaF/SaF §: ScbaF: Pd,Pp/SaF: Pd,Pp: AScba Escape: GmFOv/ScbaE		
Incompatibilities and Reactivities: None reported [Note: VM&P Naphtha is a refined petroleum solvent predominantly C ₇ -C ₁₁ which is typically 55% paraffins, 30% monocycloparaffins, 2% dicycloparaffins & 12% alkylbenzenes.]					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, upper resp sys; derm; CNS depres; chemical pneu (aspir liquid) TO: Eyes, skin, resp sys, CNS			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

m-Xylene	Formula: C ₆ H ₄ (CH ₃) ₂	CAS#: 108-38-3	RTECS#: ZE2275000	IDLH: 900 ppm
Conversion: 1 ppm = 4.34 mg/m ³		DOT: 1307 130		
Synonyms/Trade Names: 1,3-Dimethylbenzene; meta-Xylene; m-Xylol				
Exposure Limits: NIOSH REL: TWA 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³) OSHA PEL†: TWA 100 ppm (435 mg/m ³)			Measurement Methods (see Table 1): NIOSH 1501, 3800 OSHA 1002	
Physical Description: Colorless liquid with an aromatic odor.				
Chemical & Physical Properties: MW: 106.2 BP: 282°F Sol: Slight F.I.P: 82°F IP: 8.56 eV Sp.Gr: 0.86 VP: 9 mmHg FRZ: -54°F UEL: 7.0% LEL: 1.1% Class IC Flammable Liquid	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet (flamm) Change: N.R.		Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 900 ppm: CcrOv*/PapOv*/ Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFOv/ScbaE	
Incompatibilities and Reactivities: Strong oxidizers, strong acids				
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin, nose, throat; dizz, excitement, drow, inco, staggering gait; corn vacuolization; anor, nau, vomit, abdom pain; derm TO: Eyes, skin, resp sys, CNS, GI tract, blood, liver, kidneys			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

tert-Butyl Methyl Ether**General Description**

- **Synonyms:** Methyl-t-Butyl Ether; Methyl-tert-Butyl Ether; Methoxy-2-Methyl Propane; MTBE
- **Chemical Abstracts Service (CAS) Registry Number:** 1634-04-4
- **NIOSH Registry of Toxic Effects of Chemical Substances (RTECS) Identification Number:** KN5250000
- **Chemical Description and Physical Properties:**
 - **molecular formula:** C₅H₁₂O
 - **molecular weight:** 88.17
 - **boiling point:** 55.2°C
 - **vapor pressure:** kPa at 20°C: 27
 - **melting point:** -109°C

Exposure Limits

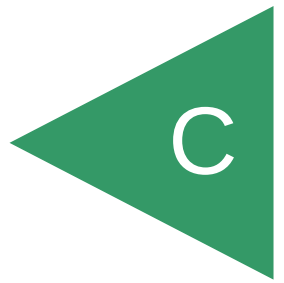
- **American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV):** 50 ppm TWA; Appendix A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

Health Factors

- **Potential Symptoms:** Drowsiness, dizziness, headache, weakness, unconsciousness; redness of skin and eyes; Acute ingestion: Nausea, vomiting, abdominal pain; chemical pneumonitis (by aspiration).
- **Health Effects:** Irritation-Eyes, skin---mild (HE16); Nervous system disturbances (HE7); Explosive, flammable (HE18)
- **Affected Organs:** Central nervous system, skin, eyes
- **Notes:**
 1. MTBE is used as a major gasoline additive (up to 15%) and experimentally for dissolving cholesterol gall stones.
 2. Metabolism of MTBE by hepatic CYP2A6 (which also metabolizes coumarin and nicotine) is strongly inhibited by the drugs, methoxsalen and tranlycypromine.
 3. Systemic exposure can occur via absorption through the skin. Most symptoms claimed for airborne MTBE exposure have not been rigorously documented, as occupational exposure is rarely to the pure compound alone. Its potent odor is recognized at 90-130 ppb.

US Department of Labor
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APPENDIX



SUBSTANCE SAFETY DATA SHEET, BENZENE**I. SUBSTANCE IDENTIFICATION**

- A. Substance: Benzene
- B. B Permissible Exposure: Except as to the use of gasoline, motor fuels and other fuels subsequent to discharge from bulk terminals and other exemptions specified in section 5218(a)(2):
 - 1. Airborne: The maximum time-weighted average exposure limit is 1 part of benzene vapor per million parts of air (1 ppm) for an 8-hour workday and the maximum short-term exposure limit (STEL) is 5 ppm as averaged over a 15-minute sampling period.
 - 2. Dermal: Eye contact must be prevented and skin contact with liquid benzene must be limited.
- C. Appearance and odor: Benzene is a clear, colorless liquid with a pleasant, sweet odor. The odor of benzene does not provide adequate warning of its hazard.

II. HEALTH HAZARD DATA

- A. Ways in which benzene affects your health. Benzene can affect your health if you inhale it, or if it comes in contact with your skin or eyes. Benzene is also harmful if you happen to swallow it.
- B. Effects of Overexposure.
 - 1. Short-term (acute) Overexposure: If you are overexposed to high concentrations of benzene, well above the levels where its odor is first recognizable, you may feel breathless, irritable, euphoric, or giddy; you may experience irritation in your eyes, nose, and respiratory tract. You may develop a headache, feel dizzy, nauseated, or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.
 - 2. Long-term (chronic) Exposure. Repeated or prolonged exposure to benzene, even at relatively low concentrations, may result in various blood disorders, ranging from anemia to leukemia, an irreversible, fatal disease. Many blood disorders associated with benzene exposure may occur without symptoms.

III. PROTECTIVE CLOTHING AND EQUIPMENT.

- A. Respirators. Respirators are required for those operations in which engineering controls or work practice controls are not feasible to reduce exposure to the permissible level. However, where employers can document that benzene is present in the workplace less than 30 days a year, respirators may be used in lieu of engineering controls. If respirators are worn, they must have joint Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH) seal of approval, and cartridges or canisters must be replaced before the end of their service life, or the end of the shift, whichever occurs first. If you experience difficulty breathing while wearing a respirator, you may request a positive pressure respirator from your employer. You must be thoroughly trained to use the assigned respirator, and the training will be provided by your employer.
- B. Protective Clothing. You must wear appropriate protective clothing (such as boots, gloves, sleeves, aprons, etc.) over any parts of your body that could be exposed to liquid benzene.
- C. Eye and Face Protection. You must wear splash-proof safety goggles if it is possible that benzene may get into your eyes. In addition, you must wear a face shield if your face could be splashed with benzene liquid.

IV. EMERGENCY AND FIRST-AID PROCEDURES.

- A. Eye and Face Exposure. If benzene is splashed in your eyes, wash it out immediately with large amounts of water. If irritation persists or vision appears to be affected see a doctor as soon as possible.
- B. Skin Exposure. If benzene is spilled on your clothing or skin, remove the contaminated clothing and wash the exposed skin with large amounts of water and soap immediately. Wash contaminated clothing before you wear it again.
- C. Breathing. If you or any other person breathes in large amounts of benzene, get the exposed person to fresh air at once. Apply artificial respiration if breathing has stopped. Call for medical assistance or a doctor as soon as possible. Never enter any vessel or confined space where the benzene concentration might be high without proper safety equipment and at least one other person present who will stay outside. A life line should be used.
- D. Swallowing. If benzene has been swallowed and the patient is conscious, do not induce vomiting. Call for medical assistance or a doctor immediately.

V. MEDICAL REQUIREMENTS

If you are exposed to benzene at a concentration at or above 0.5 ppm as an 8-hour time weighted average, or have been exposed above 10 ppm in the past while employed by your current employer, your employer is required to provide an initial medical examination and history and laboratory tests and annually thereafter. These tests shall be provided without cost to you. In addition, if you are accidentally exposed to benzene (either by ingestion, inhalation, or skin/eye contact) under emergency conditions known or suspected to constitute toxic exposure to benzene, your employer is required to make special laboratory tests available to you.

VI. OBSERVATION OF MONITORING

Your employer is required to perform measurements that are representative of your exposure to benzene and you or your designated representative are entitled to observe the monitoring procedure. You are entitled to observe the steps taken in the measurement procedure and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn, you or your representative must also be provided with, and must wear the protective clothing and equipment.

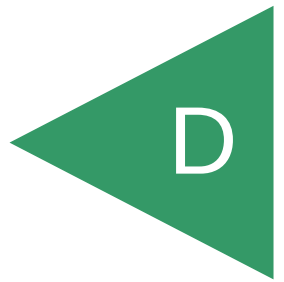
VII. ACCESS TO RECORDS

You or your representative are entitled to see the records of measurements of your exposure to benzene upon written request to your employer. Your medical examination records can be furnished to yourself, your physician or designated representative upon request by you to your employer.

VIII. PRECAUTIONS FOR SAFE USE, HANDLING AND STORAGE

Benzene liquid is highly flammable. It should be stored in tightly closed containers in a cool, well ventilated area. Benzene vapor may form explosive mixtures in air. All sources of ignition must be controlled. Use non-sparking tools when opening or closing benzene containers. Fire extinguishers, where provided, must be readily available. Know where they are located and how to operate them. Smoking is prohibited in areas where benzene is used or stored. Ask your supervisor where benzene is used in your area and for additional plant safety rules.

APPENDIX



Antimony	Formula: Sb	CAS#: 7440-36-0	RTECS#: CC4025000	IDLH: 50 mg/m ³ (as Sb)
Conversion:	DOT: 1549 157 (inorganic compounds, n.o.s.); 2871 170 (powder); 3141 157 (inorganic liquid compounds, n.o.s.)			
Synonyms/Trade Names: Antimony metal, Antimony powder, Stibium				
Exposure Limits: NIOSH REL*: TWA 0.5 mg/m ³ OSHA PEL*: TWA 0.5 mg/m ³ [*Note: The REL and PEL also apply to other antimony compounds (as Sb).]			Measurement Methods (see Table 1): NIOSH 7301, 7303, P&CAM 261 (II-4) OSHA ID121, ID125G, ID206	
Physical Description: Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder.				
Chemical & Physical Properties: MW: 121.8 BP: 2975°F Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 6.69 VP: 0 mmHg (approx) MLT: 1166°F UEL: NA LEL: NA	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily	Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 5 mg/m³: 95XQ/Sa 12.5 mg/m³: Sa:Cf/PapRHe 25 mg/m³: 100F/SaT:Cf/PapRTHie/ScbaF/SaF 50 mg/m³: Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
Noncombustible Solid in bulk form, but a moderate explosion hazard in the form of dust when exposed to flame.				
Incompatibilities and Reactivities: Strong oxidizers, acids, halogenated acids [Note: Stibine is formed when antimony is exposed to nascent (freshly formed) hydrogen.]				
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat, mouth; cough; dizz; head; nau, vomit, diarr; stomach cramps; insom; anor; unable to smell properly TO: Eyes, skin, resp sys, CVS			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

Arsenic (inorganic compounds, as As)	Formula: As (metal)	CAS#: 7440-38-2 (metal)	RTECS#: CG0525000 (metal)	IDLH: Ca [5 mg/m ³ (as As)]
Conversion:	DOT: 1558 152 (metal); 1562 152 (dust)			
Synonyms/Trade Names: Arsenic metal: Arsenia Other synonyms vary depending upon the specific As compound. [Note: OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite & all inorganic compounds containing arsenic except ARSINE.]				
Exposure Limits: NIOSH REL: Ca C 0.002 mg/m ³ [15-minute] See Appendix A OSHA PEL: [1910.1018] TWA 0.010 mg/m ³				Measurement Methods (see Table 1): NIOSH 7300, 7301, 7303, 9102, 7900 OSHA ID105
Physical Description: Metal: Silver-gray or tin-white, brittle, odorless solid.				
Chemical & Physical Properties: MW: 74.9 BP: Sublimes Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 5.73 (metal) VP: 0 mmHg (approx) MLT: 1135°F (Sublimes) UEL: NA LEL: NA	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam/Daily Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		Respirator Recommendations (see Tables 3 and 4): NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: GmFAg100/ScbaE See Appendix E (page 351)	
Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.				
Incompatibilities and Reactivities: Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]				
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Abs, Con, Ing SY: Ulceration of nasal septum, derm, GI disturbances, peri neur, resp irrit, hyperpig of skin, [carc] TO: Liver, kidneys, skin, lungs, lymphatic sys [lung & lymphatic cancer]			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed	

Barium chloride (as Ba)		Formula: BaCl ₂	CAS#: 10361-37-2	RTECS#: CQ8750000	IDLH: 50 mg/m ³ (as Ba)
Conversion:		DOT: 1564 154 (barium compound, n.o.s.)			
Synonyms/Trade Names: Barium dichloride					
Exposure Limits: NIOSH REL*: TWA 0.5 mg/m ³ OSHA PEL*: TWA 0.5 mg/m ³ [*Note: The REL and PEL also apply to other soluble barium compounds (as Ba) except Barium sulfate.]				Measurement Methods (see Table 1): NIOSH 7056, 7303 OSHA ID121	
Physical Description: White, odorless solid.					
Chemical & Physical Properties: MW: 208.2 BP: 2840°F Sol: 38% F.I.P: NA IP: ? Sp.Gr: 3.86 VP: Low MLT: 1765°F UEL: NA LEL: NA Noncombustible Solid		Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 5 mg/m³: 95XQ/Sa 12.5 mg/m³: Sa:Cf/PapRHe 25 mg/m³: 100F/SaT:Cf/PapRThie/ScbaF/SaF 50 mg/m³: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
Incompatibilities and Reactivities: Acids, oxidizers					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, upper resp sys; skin burns; gastroenteritis; musc spasm; slow pulse, extrasystoles; hypokalemia TO: Eyes, skin, resp sys, heart, CNS			First Aid (see Table 6): Eye: Irr immed Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

Beryllium & beryllium compounds (as Be)	Formula: Be (metal)	CAS#: 7440-41-7 (metal)	RTECS#: DS1750000 (metal)	IDLH: Ca [4 mg/m ³ (as Be)]
Conversion:		DOT: 1566 154 (compounds); 1567 134 (powder)		
Synonyms/Trade Names: Beryllium metal: Beryllium Other synonyms vary depending upon the specific beryllium compound.				
Exposure Limits: NIOSH REL: Ca Not to exceed 0.0005 mg/m ³ See Appendix A OSHA PEL: TWA 0.002 mg/m ³ C 0.005 mg/m ³ 0.025 mg/m ³ [30-minute maximum peak]			Measurement Methods (see Table 1): NIOSH 7102, 7300, 7301, 7303, 9102 OSHA ID125G, ID206	
Physical Description: Metal: A hard, brittle, gray-white solid.				
Chemical & Physical Properties: MW: 9.0 BP: 4532°F Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 1.85 (metal) VP: 0 mmHg (approx) MLT: 2349°F UEL: NA LEL: NA	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contam Change: Daily Provide: Eyewash		Respirator Recommendations (see Tables 3 and 4): NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of a powder or dust.				
Incompatibilities and Reactivities: Acids, caustics, chlorinated hydrocarbons, oxidizers, molten lithium				
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Con SY: Berylliosis (chronic exposure): anor, low-wgt, lass, chest pain, cough, clubbing of fingers, cyan, pulm insufficiency; irrit eyes; derm; [carc] TO: Eyes, skin, resp sys [lung cancer]			First Aid (see Table 6): Eye: Irr immed Breath: Fresh air	

Cadmium dust (as Cd)	Formula: Cd (metal)	CAS#: 7440-43-9 (metal)	RTECS#: EU0800000 (metal)	IDLH: Ca [9 mg/m ³ (as Cd)]
Conversion:	DOT: 2570 154 (cadmium compound)			
Synonyms/Trade Names: Cadmium metal: Cadmium Other synonyms vary depending upon the specific cadmium compound.				
Exposure Limits: NIOSH REL*: Ca See Appendix A OSHA PEL*: [1910.1027] TWA 0.005 mg/m ³ [*Note: The REL and PEL apply to all Cadmium compounds (as Cd).]			Measurement Methods (see Table 1): NIOSH 7048, 7300, 7301, 7303, 9102 OSHA ID121, ID125G, ID189, ID206	
Physical Description: Metal: Silver-white, blue-tinged lustrous, odorless solid.				
Chemical & Physical Properties: MW: 112.4 BP: 1409°F Sol: Insoluble FLP: NA IP: NA Sp.Gr: 8.65 (metal) VP: 0 mmHg (approx) MLT: 610°F UEL: NA LEL: NA Metal: Noncombustible Solid in bulk form, but will burn in powder form.		Personal Protection/Sanitation (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: Daily Remove: N.R. Change: Daily		Respirator Recommendations (see Tables 3 and 4): NIOSH §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE See Appendix E (page 351)
		Incompatibilities and Reactivities: Strong oxidizers; elemental sulfur, selenium & tellurium		
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing SY: Pulm edema, dysp, cough, chest tight, subs pain; head; chills, musc aches; nau, vomit, diarr; anos, emphy, prot, mild anemia; [canc] TO: Resp sys, kidneys, prostate, blood [prostatic & lung cancer]			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed	

Chromium metal		Formula: Cr	CAS#: 7440-47-3	RTECS#: GB4200000	IDLH: 250 mg/m ³ (as Cr)
Conversion:		DOT:			
Synonyms/Trade Names: Chrome, Chromium					
Exposure Limits: NIOSH REL: TWA 0.5 mg/m ³ See Appendix C OSHA PEL*: TWA 1 mg/m ³ See Appendix C [*Note: The PEL also applies to insoluble chromium salts.]				Measurement Methods (see Table 1): NIOSH 7024, 7300, 7301, 7303, 9102 OSHA ID121, ID125G	
Physical Description: Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.					
Chemical & Physical Properties: MW: 52.0 BP: 4788°F Sol: Insoluble FLP: NA IP: NA Sp.Gr: 7.14 VP: 0 mmHg (approx) MLT: 3452°F UEL: NA LEL: NA Noncombustible Solid in bulk form, but finely divided dust burns rapidly if heated in a flame.		Personal Protection/Sanitation (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		Respirator Recommendations (see Tables 3 and 4): NIOSH 2.5 mg/m ³ : Qm* 5 mg/m ³ : 95XQ*/Sa* 12.5 mg/m ³ : Sa:CP/PapRHe* 25 mg/m ³ : 100F/PapRThie*/ ScbaF/SaF 250 mg/m ³ : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
Incompatibilities and Reactivities: Strong oxidizers (such as hydrogen peroxide), alkalis					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin; lung fib (histologic) TO: Eyes, skin, resp sys			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

Cobalt metal dust and fume (as Co)		Formula: Co	CAS#: 7440-48-4	RTECS#: GF8750000	IDLH: 20 mg/m ³ (as Co)
Conversion:		DOT:			
Synonyms/Trade Names: Cobalt metal dust, Cobalt metal fume					
Exposure Limits: NIOSH REL: TWA 0.05 mg/m ³ OSHA PEL†: TWA 0.1 mg/m ³			Measurement Methods (see Table 1): NIOSH 7027, 7300, 7301, 7303, 9102 OSHA ID121, ID125G, ID213		
Physical Description: Odorless, silver-gray to black solid.					
Chemical & Physical Properties: MW: 58.9 BP: 5612°F Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 8.92 VP: 0 mmHg (approx) MLT: 2719°F UEL: NA LEL: NA Noncombustible Solid in bulk form, but finely divided dust will burn at high temperatures.	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam Remove: When wet or contam Change: Daily	Respirator Recommendations (see Tables 3 and 4): NIOSH 0.25 mg/m ³ : Qm 0.5 mg/m ³ : 95XQ*/Sa* 1.25 mg/m ³ : Sa:Cf*/PaprHie* 2.5 mg/m ³ : 100F/ScbaF/SaF 20 mg/m ³ : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE			
Incompatibilities and Reactivities: Strong oxidizers, ammonium nitrate					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Cough, dysp, wheez, decr pulm func; low-wgt; dermat; diffuse nodular fib; resp hypersensitivity, asthma TO: Skin, resp sys			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash Breath: Resp support Swallow: Medical attention immed		

Copper (dusts and mists, as Cu)		Formula: Cu	CAS#: 7440-50-8	RTECS#: GL5325000	IDLH: 100 mg/m ³ (as Cu)
Conversion:		DOT:			
Synonyms/Trade Names: Copper metal dusts, Copper metal fumes					
Exposure Limits: NIOSH REL*: TWA 1 mg/m ³ OSHA PEL*: TWA 1 mg/m ³ [*Note: The REL and PEL also apply to other copper compounds (as Cu) except copper fume.]				Measurement Methods (see Table 1): NIOSH 7029, 7300, 7301, 7303, 9102 OSHA ID121, ID125G	
Physical Description: Reddish, lustrous, malleable, odorless solid.					
Chemical & Physical Properties: MW: 63.5 BP: 4703°F Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 8.94 VP: 0 mmHg (approx) MLT: 1981°F UEL: NA LEL: NA Noncombustible Solid in bulk form, but powdered form may ignite.	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily		Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 5 mg/m ³ : Qm* 10 mg/m ³ : 95XQ*/Sa* 25 mg/m ³ : Sa:Cf*/PaprHie* 50 mg/m ³ : 100F/PaprTHie*/ScbaF/SaF 100 mg/m ³ : SaF: Pd, Pp §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE		
Incompatibilities and Reactivities: Oxidizers, alkalis, sodium azide, acetylene					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, nose, pharynx; nasal septum perf; metallic taste; dermat; in animals: lung, liver, kidney damage; anemia TO: Eyes, skin, resp sys, liver, kidneys (incr risk with Wilson's disease)				First Aid (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

Chromic acid and chromates		Formula: CrO ₃ (acid)	CAS#: 1333-82-0 (CrO ₃)	RTECS#: GB6650000 (CrO ₃)	IDLH: Ca [15 mg/m ³ {as Cr(VI)}]
Conversion:		DOT: 1755 154 (acid solution); 1463 141 (acid, solid)			
Synonyms/Trade Names: Chromic acid (CrO₃): Chromic anhydride, Chromic oxide, Chromium(VI) oxide (1:3), Chromium trioxide. Synonyms of chromates (i.e., chromium(VI) compounds) such as zinc chromate vary depending upon the specific compound.					
Exposure Limits: NIOSH REL (as Cr): Ca TWA 0.001 mg/m ³ See Appendix A See Appendix C OSHA PEL (as CrO₃): C 0.1 mg/m ³ See Appendix C				Measurement Methods (see Table 1): NIOSH 7600, 7604, 7605 OSHA ID103, ID215, W4001	
Physical Description: CrO ₃ : Dark-red, odorless flakes or powder. [Note: Often used in an aqueous solution (H ₂ CrO ₄).]					
Chemical & Physical Properties: MW: 100.0 BP: 482°F (Decomposes) Sol: 63% F.I.P: NA IP: NA Sp.Gr: 2.70 (CrO ₃) VP: Very low MLT: 387°F (Decomposes) UEL: NA LEL: NA CrO ₃ : Noncombustible Solid, but will accelerate the burning of combustible materials.		Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: Daily Provide: Eyewash Quick drench		Respirator Recommendations (see Tables 3 and 4): NIOSH ¥: ScbaF: Pd, Pp/ SaF: Pd, Pp: AScba Escape: 100F/ScbaE	
		Incompatibilities and Reactivities: Combustible, organic, or other readily oxidizable materials (paper, wood, sulfur, aluminum, plastics, etc.); corrosive to metals			
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit resp sys; nasal septum perf; liver, kidney damage; leucyt, leupen, eosin; eye inj, conj; skin ulcer, sens derm; [carc] TO: Blood, resp sys, liver, kidneys, eyes, skin [lung cancer]				First Aid (see Table 6): Eye: Irr immed Skin: Soap flush immed Breath: Resp support Swallow: Medical attention immed	

Mercury compounds [except (organo) alkyls] (as Hg)		Formula: Hg (metal)	CAS#: 7439-97-6 (metal)	RTECS#: OV4550000 (metal)	IDLH: 10 mg/m ³ (as Hg)
Conversion:		DOT: 2809 172 (metal)			
Synonyms/Trade Names: Mercury metal: Colloidal mercury, Metallic mercury, Quicksilver Synonyms of "other" Hg compounds vary depending upon the specific compound.					
Exposure Limits: NIOSH REL: Hg Vapor: TWA 0.05 mg/m ³ [skin] Other: C 0.1 mg/m ³ [skin]				OSHA PEL†: C 0.1 mg/m ³	Measurement Methods (see Table 1): NIOSH 6009 OSHA ID140
Physical Description: Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]					
Chemical & Physical Properties: MW: 200.6 BP: 674°F Sol: Insoluble F.I.P: NA IP: ? Sp.Gr: 13.6 (metal) VP: 0.0012 mmHg FRZ: -38°F UEL: NA LEL: NA Metal: Noncombustible Liquid		Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam Remove: When wet or contam Change: Daily		Respirator Recommendations (see Tables 3 and 4): Mercury vapor: NIOSH 0.5 mg/m ³ : CcrSt/Sa 1.25 mg/m ³ : Sa:Cf/PapRSt+(canister) 2.5 mg/m ³ : CcrFSt+/GmFSt+/SaT:Cf/ PapRtS(canister)/ScbaF/SaF 10 mg/m ³ : Sa: Pd, Pp §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFS/ScbaE Other mercury compounds: NIOSH/OSHA 1 mg/m ³ : CcrSt/Sa 2.5 mg/m ³ : Sa:Cf/PapRSt+(canister) 5 mg/m ³ : CcrFSt+/GmFSt+/SaT:Cf/ PapRtS(canister)/ScbaF/SaF 10 mg/m ³ : Sa: Pd, Pp §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: GmFS/ScbaE	
Incompatibilities and Reactivities: Acetylene, ammonia, chlorine dioxide, azides, calcium (amalgam formation), sodium carbide, lithium, rubidium, copper					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Abs, Ing, Con SY: Irrit eyes, skin; cough, chest pain, dysp, bron, pneu; tremor, insom, irrity, indecision, head, lass; stomatitis, salv; GI dist, anor, low-wgt; prot TO: Eyes, skin, resp sys, CNS, kidneys				First Aid (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed	

Molybdenum (soluble compounds, as Mo)		Formula:	CAS#:	RTECS#:	IDLH: 1000 mg/m ³ (as Mo)
Conversion:		DOT:			
Synonyms/Trade Names: Synonyms vary depending upon the specific soluble molybdenum compound.					
Exposure Limits: NIOSH REL: See Appendix D OSHA PEL: TWA 5 mg/m ³				Measurement Methods (see Table 1): NIOSH 7300, 7301, 7303, 9102 OSHA ID121, ID125G	
Physical Description: Appearance and odor vary depending upon the specific soluble molybdenum compound.					
Chemical & Physical Properties: Properties vary depending upon the specific soluble molybdenum compound.	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.		Respirator Recommendations (see Tables 3 and 4): OSHA 25 mg/m ³ : Qm* 50 mg/m ³ : 95XQ*/Sa* 125 mg/m ³ : Sa:Cf*/PaprHie* 250 mg/m ³ : 100F/SaT:Cf*/PaprTHie*/ScbaF/SaF 1000 mg/m ³ : SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
Incompatibilities and Reactivities: Varies					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: In animals: irrit eyes, nose, throat; anor; inco; dysp; anemia TO: Eyes, resp sys, kidneys, blood			First Aid (see Table 6): Eye: Irr immed Skin: Water flush Breath: Resp support Swallow: Medical attention immed		

Nickel metal and other compounds (as Ni)		Formula: Ni (metal)	CAS#: 7440-02-0 (metal)	RTECS#: QR5950000 (metal)	IDLH: Ca [10 mg/m ³ (as Ni)]
Conversion:		DOT:			
Synonyms/Trade Names: Nickel metal: Elemental nickel, Nickel catalyst Synonyms of other nickel compounds vary depending upon the specific compound.					
Exposure Limits: NIOSH REL*: Ca TWA 0.015 mg/m ³ See Appendix A OSHA PEL*†: TWA 1 mg/m ³ [*Note: The REL and PEL do not apply to Nickel carbonyl.]				Measurement Methods (see Table 1): NIOSH 7300, 7301, 7303, 9102 OSHA ID121, ID125G	
Physical Description: Metal: Lustrous, silvery, odorless solid.					
Chemical & Physical Properties: MW: 58.7 BP: 5139°F Sol: Insoluble FLP: NA IP: NA Sp.Gr: 8.90 (Metal) VP: 0 mmHg (approx) MLT: 2831°F UEL: NA LEL: NA Metal: Combustible Solid; nickel sponge catalyst may ignite SPONTANEOUSLY in air.		Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam/Daily Remove: When wet or contam Change: Daily		Respirator Recommendations (see Tables 3 and 4): NIOSH ¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
		Incompatibilities and Reactivities: Strong acids, sulfur, selenium, wood & other combustibles, nickel nitrate			
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Sens derm, allergic asthma, pneu; [carc] TO: Nasal cavities, lungs, skin [lung and nasal cancer]			First Aid (see Table 6): Skin: Water flush immed Breath: Resp support Swallow: Medical attention immed		

Selenium		Formula: Se	CAS#: 7782-49-2	RTECS#: VS7700000	IDLH: 1 mg/m ³ (as Se)
Conversion:		DOT: 2658 152 (powder)			
Synonyms/Trade Names: Elemental selenium, Selenium alloy					
Exposure Limits: NIOSH REL*: TWA 0.2 mg/m ³ OSHA PEL*: TWA 0.2 mg/m ³ [*Note: The REL and PEL also apply to other selenium compounds (as Se) except Selenium hexafluoride.]				Measurement Methods (see Table 1): NIOSH 7300, 7301, 7303, 9102, S190 (II-7) OSHA ID121	
Physical Description: Amorphous or crystalline, red to gray solid. [Note: Occurs as an impurity in most sulfide ores.]					
Chemical & Physical Properties: MW: 79.0 BP: 1265°F Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 4.28 VP: 0 mmHg (approx) MLT: 392°F UEL: NA LEL: NA Combustible Solid	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: N.R. Wash skin: When contam Remove: When wet or contam Change: N.R. Provide: Quick drench		Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 1 mg/m³: Qm*/95XQ*/100F/Paprhie*/Paprhie*/Sa*/ScbaF §: ScbaF: Pd, Pp/SaF: Pd, Pp: AScba Escape: 100F/ScbaE		
Incompatibilities and Reactivities: Acids, strong oxidizers, chromium trioxide, potassium bromate, cadmium					
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, nose, throat; vis dist; head; chills, fever; dysp, bron; metallic taste, garlic breath, GI dist; derm; eye, skin burns; in animals: anemia; liver nec, cirr; kidney, spleen damage TO: Eyes, skin, resp sys, liver, kidneys, blood, spleen			First Aid (see Table 6): Eye: Irr immed Skin: Soap wash immed Breath: Resp support Swallow: Medical attention immed		

Silver (metal dust and soluble compounds, as Ag)	Formula: Ag (metal)	CAS#: 7440-22-4 (metal)	RTECS#: VW3500000 (metal)	IDLH: 10 mg/m ³ (as Ag)
Conversion:	DOT:			
Synonyms/Trade Names: Silver metal: Argentum Synonyms of soluble silver compounds such as Silver nitrate (AgNO ₃) vary depending upon the specific compound.				
Exposure Limits: NIOSH REL: TWA 0.01 mg/m ³ OSHA PEL: TWA 0.01 mg/m ³			Measurement Methods (see Table 1): NIOSH 7300, 7301, 9102 OSHA ID121	
Physical Description: Metal: White, lustrous solid.				
Chemical & Physical Properties: MW: 107.9 BP: 3632°F Sol: Insoluble F.I.P: NA IP: NA Sp.Gr: 10.49 (metal) VP: 0 mmHg (approx) MLT: 1761°F UEL: NA LEL: NA Metal: Noncombustible Solid, but flammable in form of dust or powder.	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam (AgNO ₃) Change: Daily Provide: Eyewash		Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 0.25 mg/m³: Sa:CfE/PapHieE 0.5 mg/m³: 100F/ScbaF/SaF 10 mg/m³: SaF: Pd, Pp §: ScbaF: Pd, Pp/SaF: Pd, Pp: ASba Escape: 100F/ScbaE	
	Incompatibilities and Reactivities: Acetylene, ammonia, hydrogen peroxide, bromoazide, chlorine trifluoride, ethyleneimine, oxalic acid, tartaric acid			
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Blue-gray eyes, nasal septum, throat, skin; irrit, ulceration skin; GI dist TO: Nasal septum, skin, eyes		First Aid (see Table 6): Eye: Irr immed Skin: Water flush Breath: Resp support Swallow: Medical attention immed		

Vanadium dust	Formula: V ₂ O ₅	CAS#: 1314-62-1	RTECS#: YW2450000	IDLH: 35 mg/m ³ (as V)
Conversion:		DOT: 2862 151		
Synonyms/Trade Names: Divanadium pentoxide dust, Vanadic anhydride dust, Vanadium oxide dust, Vanadium pentaoxide dust. Other synonyms vary depending upon the specific vanadium compound.				
Exposure Limits: NIOSH REL*: C 0.05 mg V/m ³ [15-minute] [*Note: The REL applies to all vanadium compounds except Vanadium metal and Vanadium carbide (see Ferrovandium dust).] OSHA PEL†: C 0.5 mg V ₂ O ₅ /m ³ (resp)			Measurement Methods (see Table 1): NIOSH 7300, 7301, 7303, 7504, 9102 OSHA ID185	
Physical Description: Yellow-orange powder or dark-gray, odorless flakes dispersed in air.				
Chemical & Physical Properties: MW: 181.9 BP: 3182°F (Decomposes) Sol: 0.8% F.I.P: NA IP: NA Sp.Gr: 3.36 VP: 0 mmHg (approx) MLT: 1274°F UEL: NA LEL: NA Noncombustible Solid, but may increase intensity of fire when in contact with combustible materials.	Personal Protection/Sanitation (see Table 2): Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contam Remove: When wet or contam Change: N.R.	Respirator Recommendations (see Tables 3 and 4): NIOSH (as V) 0.5 mg/m³: 100XQ*/Sa* 1.25 mg/m³: Sa:Cf*/Paprhie* 2.5 mg/m³: 100F/Paprhie*/ScbaF/SaF 35 mg/m³: SaF:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE		
Incompatibilities and Reactivities: Lithium, chlorine trifluoride				
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh, Ing, Con SY: Irrit eyes, skin, throat; green tongue, metallic taste, eczema; cough; fine rales, wheez, bron, dysp TO: Eyes, skin, resp sys		First Aid (see Table 6): Eye: Irr immed Skin: Soap wash prompt Breath: Resp support Swallow: Medical attention immed		

Zinc oxide	Formula: ZnO	CAS#: 1314-13-2	RTECS#: ZH4810000	IDLH: 500 mg/m ³
Conversion:		DOT: 1516 143		
Synonyms/Trade Names: Zinc peroxide				
Exposure Limits: NIOSH REL: Dust: TWA 5 mg/m ³ C 15 mg/m ³ Fume: TWA 5 mg/m ³ ST 10 mg/m ³ OSHA PEL†: TWA 5 mg/m ³ (fume) TWA 15 mg/m ³ (total dust) TWA 5 mg/m ³ (resp dust)			Measurement Methods (see Table 1): NIOSH 7303, 7502 OSHA ID121, ID143	
Physical Description: White, odorless solid.				
Chemical & Physical Properties: MW: 81.4 BP: ? Sol(64°F): 0.0004% F.I.P: NA IP: NA Sp.Gr: 5.61 VP: 0 mmHg (approx) MLT: 3587°F UEL: NA LEL: NA Noncombustible Solid	Personal Protection/Sanitation (see Table 2): Skin: N.R. Eyes: N.R. Wash skin: N.R. Remove: N.R. Change: N.R.		Respirator Recommendations (see Tables 3 and 4): NIOSH/OSHA 50 mg/m³: 95XQ/Sa 125 mg/m³: Sa:Cf/Paprhie 250 mg/m³: 100F/SaT:Cf/Paprhie/ ScbaF/SaF 500 mg/m³: Sa:Pd,Pp §: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba Escape: 100F/ScbaE	
	Incompatibilities and Reactivities: Chlorinated rubber (at 419°F), water [Note: Slowly decomposed by water.]			
Exposure Routes, Symptoms, Target Organs (see Table 5): ER: Inh SY: Metal fume fever: chills, musc ache, nau, fever, dry throat, cough; lass; metallic taste; head; blurred vision; low back pain; vomit; mal; chest tight; dysp, rales, decr pulm func TO: Resp sys			First Aid (see Table 6): Breath: Resp support	

APPENDIX

E

I. SUBSTANCE IDENTIFICATION

- A. Substance. Inorganic Arsenic.
- B. Definition. Copper acetoarsenite, arsenic and all inorganic compounds containing arsenic except arsine, measured as arsenic (As).
- C. Permissible Exposure Limit. 0.01 milligrams per cubic meter of air (same as 10 micrograms per cubic meter of air) as determined as an average over an 8-hour period. No employee may be exposed to any skin or eye contact with arsenic trichloride or to skin or eye contact likely to cause skin or eye irritation.
- D. Action Level. 0.005 milligrams per cubic meter of air (same as 5 micrograms per cubic meter of air) determined as an average over an 8-hour period.
- E. Regulated Areas. Only employees authorized by your employer should enter a regulated area.

II. HEALTH HAZARD DATA

- A. Comments. The health hazard of inorganic arsenic is high.
- B. Ways In Which Inorganic Arsenic Affects Your Body. Exposure to airborne inorganic arsenic may cause lung cancer, and it can be a skin irritant. Inorganic arsenic may also affect your body if swallowed. One compound in particular, arsenic trichloride, is especially dangerous because it is highly corrosive and it can be absorbed readily through the skin. Because inorganic arsenic is a poison, you should wash your hands thoroughly prior to eating or smoking.

III. PROTECTIVE CLOTHING AND EQUIPMENT

- A. Respirators. Respirators will be provided by your employer at no cost to you for routine use if your employer is in the process of implementing engineering and work practice controls or where engineering and work practice controls are not feasible or insufficient. You must wear respirators for non-routine activities or in emergency situations where you are likely to be exposed to levels of inorganic arsenic in excess of the permissible exposure limit. Since how well your respirator fits your face is very important, your employer is required to conduct fit tests to make sure the respirator seals properly when you wear it. These tests are simple and rapid and will be explained to you during training sessions.
- B. Protective clothing. If you work in a regulated area, your employer is required to provide at no cost to you, and you must wear, appropriate, clean, protective clothing and equipment. The purpose of this equipment is to prevent you from bringing to your home arsenic-contaminated dust and to protect your body from repeated skin contact with inorganic arsenic likely to cause skin irritation. This clothing should include such items as coveralls or similar full-body clothing, gloves, shoes or coverlets, and aprons. Protective equipment should include face shields or vented goggles where eye injury may occur.

IV. HYGIENE FACILITIES AND PRACTICES

You must not eat, drink, smoke, chew gum or tobacco, or apply cosmetics in the regulated area, except that drinking water is permitted. If you work in a regulated area your employer is required to provide lunch rooms and other areas for these purposes.

If you work in a regulated area, your employer is required to provide showers, washing facilities, and change rooms. You must wash your face and hands before eating and must shower at the end of the work shift. Do not take used protective clothing out of change rooms without your employer's permission. Your employer is required to provide for laundering or cleaning of your protective clothing.

V. SIGNS AND LABELS

Your employer is required to post warning signs and labels for your protection. Signs must be posted in regulated areas. The signs must warn that a cancer hazard is present, that only authorized employees may enter the area, and that no smoking or eating is allowed, and that respirators must be worn.

VI. MEDICAL EXAMINATIONS

If your exposure to arsenic is over the action level at least 30 days per year, or you have been exposed to arsenic for more than 10 years over the action level, your employer is required to provide you with a medical examination. The examination shall be every 6 months for employees over 45 years old or with more than 10 years exposure over the action level and annually for other covered employees. The initial medical examination must include a medical history; a chest X-ray; skin examination; nasal examination and sputum cytology examination for the early detection of lung cancer. In subsequent medical examinations, the chest X-ray is not required unless recommended by the physician. The cytology exams are only included in the initial examination and examinations given after you are either 45 years or older or have 10 or more years employment over the action level. The examining physician will provide a written opinion to your employer interpreting the results of the medical exams. You should also receive a copy of this opinion. The physician must not tell your employer any conditions he or she detects unrelated to occupational exposure to arsenic but must tell you those conditions.

VII. OBSERVATION OF MONITORING

Your employer is required to monitor your exposure to arsenic and you or your representatives are entitled to observe the monitoring procedure. You are entitled to receive an explanation of the measurement procedure, and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn, you must also be provided with and must wear the protective clothing and equipment.

VIII. ACCESS TO RECORDS

You or your representative are entitled to records of your exposure to inorganic arsenic upon request to your employer. Your medical examination records can be furnished to you, your physician, or any other individual or organization that you designate if you request your employer to provide them.

IX. TRAINING AND NOTIFICATION

Additional information on all of these items plus training as to hazards of exposure to inorganic arsenic and the engineering and work practice controls associated with your job will also be provided by your employer. If you are exposed over the permissible exposure limit, your employer must inform you of that fact and the actions he or she is taking to reduce your exposures.

APPENDIX



SUBSTANCE SAFETY DATA SHEET

I. Substance Identification

A. Substance: Cadmium.

B. 8-Hour, Time-weighted-average, Permissible Exposure Limit (TWA PEL):

TWA PEL: Five micrograms of cadmium per cubic meter of air 5 µg/m³, time-weighted average (TWA) for an 8-hour workday.

C. Appearance: Cadmium metal - soft, blue-white, malleable, lustrous metal or grayish-white powder. Some cadmium compounds may also appear as a brown, yellow, or red powdery substance.

II. Health Hazard Data

A. Routes of Exposure.

Cadmium can cause local skin or eye irritation. Cadmium can affect your health if you inhale it or if you swallow it.

B. Effects of overexposure.

1. Short-term (acute) exposure: Cadmium is much more dangerous by inhalation than by ingestion. High exposures to cadmium that may be immediately dangerous to life or health occur in jobs where workers handle large quantities of cadmium dust or fume; heat cadmium-containing compounds or cadmium-coated surfaces; weld with cadmium solders or cut cadmium-containing materials such as bolts.
2. Severe exposure may occur before symptoms appear. Early symptoms may include mild irritation of the upper respiratory tract, a sensation of constriction of the throat, a metallic taste and/or a cough. A period of 1 - 10 hours may precede the onset of rapidly progressing shortness of breath, chest pain, and flu-like symptoms with weakness, fever, headache, chills, sweating and muscular pain. Acute pulmonary edema usually develops within 24 hours and reaches a maximum by three days. If death from asphyxia does not occur, symptoms may resolve within a week.
3. Long-term (chronic) exposure. Repeated or long-term exposure to cadmium, even at relatively low concentrations, may result in kidney damage and an increased risk of cancer of the lung and of the prostate.

C. Emergency First Aid Procedures

1. Eye exposure: Direct contact may cause redness or pain. Wash eyes immediately with large amounts of water, lifting the upper and lower eyelids. Get medical attention immediately.
2. Skin exposure: Direct contact may result in irritation. Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water. Get medical attention immediately.
3. Ingestion: Ingestion may result in vomiting, abdominal pain, nausea, diarrhea, headache and sore throat. Treatment for symptoms must be administered by medical personnel. Under no circumstances should the employer allow any person whom he retains, employs, supervises or controls to engage in therapeutic chelation. Such treatment is likely to translocate cadmium from pulmonary or other tissue to renal tissue. Get medical attention immediately.
4. Inhalation: If large amounts of cadmium are inhaled, the exposed person must be moved to fresh air at once. If breathing has stopped, perform cardiopulmonary resuscitation. Administer oxygen if available. Keep the affected person warm and at rest. Get medical attention immediately.

5. Rescue: Move the affected person from the hazardous exposure. If the exposed person has been overcome, attempt rescue only after notifying at least one other person of the emergency and putting into effect established emergency procedures. Do not become a casualty yourself. Understand your emergency rescue procedures and know the location of the emergency equipment before the need arises.

III. Employee Information

A. Protective Clothing and Equipment

1. Respirators: You may be required to wear a respirator for non-routine activities; in emergencies; while your employer is in the process of reducing cadmium exposures through engineering controls; and where engineering controls are not feasible. If respirators are worn in the future, they must have a joint Mine Safety and Health Administration (MSHA) and National Institute for Occupational Safety and Health (NIOSH) label of approval. Cadmium does not have a detectable odor except at levels well above the permissible exposure limits. If you can smell cadmium while wearing a respirator, proceed immediately to fresh air. If you experience difficulty breathing while wearing a respirator, tell your employer.
2. Protective Clothing: You may be required to wear impermeable clothing, gloves, foot gear, a face shield, or other appropriate protective clothing to prevent skin contact with cadmium. Where protective clothing is required, your employer must provide clean garments to you as necessary to assure that the clothing protects you adequately. The employer must replace or repair protective clothing that has become torn or otherwise damaged.
3. Eye Protection: You may be required to wear splash-proof or dust resistant goggles to prevent eye contact with cadmium.

B. Employer Requirements

1. Medical: If you are exposed to cadmium at or above the action level, your employer is required to provide a medical examination, laboratory tests and a medical history according to the medical surveillance provisions under paragraph (I) of this standard. (See summary chart and tables in this Appendix A.) These tests shall be provided without cost to you. In addition, if you are accidentally exposed to cadmium under conditions known or suspected to constitute toxic exposure to cadmium, your employer is required to make special tests available to you.
2. Access to Records: All medical records are kept strictly confidential. You or your representative are entitled to see the records of measurements of your exposure to cadmium. Your medical examination records can be furnished to your personal physician or designated representative upon request by you to your employer.
3. Observation of Monitoring: Your employer is required to perform measurements that are representative of your exposure to cadmium and you or your designated representative are entitled to observe the monitoring procedure. You are entitled to observe the steps taken in the measurement procedure, and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn, you or your representative must also be provided with, and must wear the protective clothing and equipment.

C. Employee Requirements

You will not be able to smoke, eat, drink, chew gum or tobacco, or apply cosmetics while working with cadmium in regulated areas. You will also not be able to carry or store tobacco products, gum, food, drinks or cosmetics in regulated areas because these products easily become contaminated with cadmium from the workplace and can therefore create another source unnecessary of cadmium exposure.

Some workers will have to change out of work clothes and shower at the end of the day, as part of their workday, in order to wash cadmium from skin and hair. Handwashing and cadmium-free eating

facilities shall be provided by the employer and proper hygiene should always be performed before eating. It is also recommended that you do not smoke or use tobacco products, because among other things, they naturally contain cadmium. For further information, read the labeling on such products.

IV. Physician Information

A. Introduction

The medical surveillance provisions of paragraph (l) generally are aimed at accomplishing three main interrelated purposes: first, identifying employees at higher risk of adverse health effects from excess, chronic exposure to cadmium; second, preventing cadmium-induced disease; and third, detecting and minimizing existing cadmium-induced disease. The core of medical surveillance in this standard is the early and periodic monitoring of the employee's biological indicators of: a) recent exposure to cadmium; b) cadmium body burden; and c) potential and actual kidney damage associated with exposure to cadmium.

The main adverse health effects associated with cadmium overexposure are lung cancer and kidney dysfunction. It is not yet known how to adequately biologically monitor human beings to specifically prevent cadmium-induced lung cancer. By contrast, the kidney can be monitored to provide prevention and early detection of cadmium-induced kidney damage. Since, for non-carcinogenic effects, the kidney is considered the primary target organ of chronic exposure to cadmium, the medical surveillance provisions of this standard effectively focus on cadmium-induced kidney disease. Within that focus, the aim, where possible, is to prevent the onset of such disease and, where necessary, to minimize such disease as may already exist. The by-products of successful prevention of kidney disease are anticipated to be the reduction and prevention of other cadmium-induced diseases.

B. Health Effects

The major health effects associated with cadmium overexposure are described below.

1. Kidney

The most prevalent non-malignant disease observed among workers chronically exposed to cadmium is kidney dysfunction. Initially, such dysfunction is manifested as proteinuria. The proteinuria associated with cadmium exposure is most commonly characterized by excretion of low-molecular weight proteins (15,000 to 40,000 MW) accompanied by loss of electrolytes, uric acid, calcium, amino acids, and phosphate. The compounds commonly excreted include: beta-2-microglobulin (β_2 -M), retinol binding protein (RBP), immunoglobulin light chains, and lysozyme. Excretion of low molecular weight proteins are characteristic of damage to the proximal tubules of the kidney (Iwao et al., 1980).

It has also been observed that exposure to cadmium may lead to urinary excretion of high-molecular weight proteins such as albumin, immunoglobulin G, and glycoproteins (Ex. 29). Excretion of high-molecular weight proteins is typically indicative of damage to the glomeruli of the kidney. Bernard et al., (1979) suggest that damage to the glomeruli and damage to the proximal tubules of the kidney may both be linked to cadmium exposure but they may occur independently of each other.

Several studies indicate that the onset of low-molecular weight proteinuria is a sign of irreversible kidney damage (Friberg et al., 1974; Roels et al., 1982; Piscator 1984; Elinder et al., 1985; Smith et al., 1986). Above specific levels of β_2 -M associated with cadmium exposure it is unlikely that β_2 -M levels return to normal even when cadmium exposure is eliminated by removal of the individual from the cadmium work environment (Friberg, Ex. 29, 1990).

Some studies indicate that such proteinuria may be progressive; levels of β_2 -M observed in the urine increase with time even after cadmium exposure has ceased. See, for example, Elinder et al., 1985. Such observations, however, are not universal, and it has been suggested that studies in which proteinuria has not been observed to progress may not have tracked patients for a sufficiently long time interval (Jarup, Ex. 8-661).

When cadmium exposure continues after the onset of proteinuria, chronic nephrotoxicity may occur (Friberg, Ex. 29). Uremia results from the inability of the glomerulus to adequately filter blood. This leads to severe disturbance of electrolyte concentrations and may lead to various clinical complications including kidney stones (L-140-50).

After prolonged exposure to cadmium, glomerular proteinuria, glucosuria, aminoaciduria, phosphaturia, and hypercalciuria may develop (Exs. 8-86, 4-28, 14-18). Phosphate, calcium, glucose, and amino acids are essential to life, and under normal conditions, their excretion should be regulated by the kidney. Once low molecular weight proteinuria has developed, these elements dissipate from the human body. Loss of glomerular function may also occur, manifested by decreased glomerular filtration rate and increased serum creatinine. Severe cadmium-induced renal damage may eventually develop into chronic renal failure and uremia (Ex. 55).

Studies in which animals are chronically exposed to cadmium confirm the renal effects observed in humans (Friberg et al., 1986). Animal studies also confirm problems with calcium metabolism and related skeletal effects which have been observed among humans exposed to cadmium in addition to the renal effects. Other effects commonly reported in chronic animal studies include anemia, changes in liver morphology, immunosuppression and hypertension. Some of these effects may be associated with co-factors. Hypertension, for example, appears to be associated with diet as well as cadmium exposure. Animals injected with cadmium have also shown testicular necrosis (Ex. 8-86B).

2. Biological Markers

It is universally recognized that the best measures of cadmium exposures and its effects are measurements of cadmium in biological fluids, especially urine and blood. Of the two, CdU is conventionally used to determine body burden of cadmium in workers without kidney disease. CdB is conventionally used to monitor for recent exposure to cadmium. In addition, levels of CdU and CdB historically have been used to predict the percent of the population likely to develop kidney disease (Thun et al., Ex. L-140-50; WHO, Ex. 8-674; ACGIH, Exs. 8-667, 140-50).

The third biological parameter upon which OSHA relies for medical surveillance is Beta-2-microglobulin in urine (β_2 -M), a low molecular weight protein. Excess β_2 -M has been widely accepted by physicians and scientists as a reliable indicator of functional damage to the proximal tubule of the kidney (Exs. 8- 447, 144-3-C, 4-47, L-140-45, 19-43-A).

Excess β_2 -M is found when the proximal tubules can no longer reabsorb this protein in a normal manner. This failure of the proximal tubules is an early stage of a kind of kidney disease that commonly occurs among workers with excessive cadmium exposure. Used in conjunction with biological test results indicating abnormal levels of CdU and CdB, the finding of excess β_2 -M can establish for an examining physician that any existing kidney disease is probably cadmium-related (Trs. 6/6/90, pp. 82- 86, 122, 134). The upper limits of normal levels for cadmium in urine and cadmium in blood are 3 μg Cd/gram creatinine in urine and 5 μg Cd/liter whole blood, respectively. These levels were derived from broad-based population studies.

Three issues confront the physicians in the use of β_2 -M as a marker of kidney dysfunction and material impairment. First, there are a few other causes of elevated levels of β_2 -M not related to cadmium exposures, some of which may be rather common diseases and some of which are serious diseases (e.g., myeloma or transient flu, Exs. 29 and 8-086). These can be medically evaluated as alternative causes (Friberg, Ex. 29). Also, there are other factors that can cause β_2 -

M to degrade so that low levels would result in workers with tubular dysfunction. For example, regarding the degradation of β_2 -M, workers with acidic urine (pH < 6) might have β_2 -M levels that are within the "normal" range when in fact kidney dysfunction has occurred (Ex. L-140-1) and the low molecular weight proteins are degraded in acid urine. Thus, it is very important that the pH of urine be measured, that urine samples be buffered as necessary (See Appendix F.), and that urine samples be handled correctly, i.e., measure the pH of freshly voided urine samples, then if necessary, buffer to pH > 6 (or above for shipping purposes), measure pH again and then, perhaps, freeze the sample for storage and shipping. (See also Appendix F.) Second, there is debate over the pathological significance of proteinuria, however, most world experts believe that β_2 -M levels greater than 300 $\mu\text{g/g Cr}$ are abnormal (Elinder, Ex. 55, Friberg, Ex. 29). Such levels signify kidney dysfunction that constitutes material impairment of health. Finally, detection of β_2 -M at low levels has often been considered difficult, however, many laboratories have the capability of detecting excess β_2 -M using simple kits, such as the Phadebas Delphia test, that are accurate to levels of 100 $\mu\text{g } \beta_2\text{-M/g Cr U}$ (Ex. L-140-1).

Specific recommendations for ways to measure β_2 -M and proper handling of urine samples to prevent degradation of β_2 -M have been addressed by OSHA in Appendix F, in the section on laboratory standardization. All biological samples must be analyzed in a laboratory that is proficient in the analysis of that particular analyte, under paragraph (l)(1)(iv). [See Appendix F]. Specifically, under paragraph (l)(1)(iv), the employer is to assure that the collecting and handling of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine (β_2 -M) taken from employees is collected in a manner that assures reliability. The employer must also assure that analysis of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine (β_2 -M) taken from employees is performed in laboratories with demonstrated proficiency for that particular analyte. (See Appendix F.)

3. Lung and Prostrate Cancer

The primary sites for cadmium-associated cancer appear to be the lung and the prostate (L-140-50). Evidence for an association between cancer and cadmium exposure derives from both epidemiological studies and animal experiments. Mortality from prostate cancer associated with cadmium is slightly elevated in several industrial cohorts, but the number of cases is small and there is not clear dose-response relationship. More substantive evidence exists for lung cancer.

The major epidemiological study of lung cancer was conducted by Thun et al., (Ex. 4-68). Adequate data on cadmium exposures were available to allow evaluation of dose-response relationships between cadmium exposure and lung cancer. A statistically significant excess of lung cancer attributed to cadmium exposure was observed in this study even when confounding variables such as co-exposure to arsenic and smoking habits were taken into consideration (Ex. L-140-50).

The primary evidence for quantifying a link between lung cancer and cadmium exposure from animal studies derives from two rat bioassay studies; one by Takenaka et al., (1983), which is a study of cadmium chloride and a second study by Oldiges and Glaser (1990) of four cadmium compounds.

Based on the above cited studies, the U.S. Environmental Protection Agency (EPA) classified cadmium as "B1", a probable human carcinogen, in 1985 (Ex. 4-4). The International Agency for Research on Cancer (IARC) in 1987 also recommended that cadmium be listed as "2A", a probable human carcinogen (Ex. 4-15). The American Conference of Governmental Industrial Hygienists (ACGIH) has recently recommended that cadmium be labeled as a carcinogen. Since 1984, NIOSH has concluded that cadmium is possibly a human carcinogen and has recommended that exposures be controlled to the lowest level feasible.

4. Non-carcinogenic Effects

Acute pneumonitis occurs 10 to 24 hours after initial acute inhalation of high levels of cadmium fumes with symptoms such as fever and chest pain (Exs. 30, 8-86B). In extreme exposure cases pulmonary edema may develop and cause death several days after exposure. Little actual exposure measurement data is available on the level of airborne cadmium exposure that causes such immediate adverse lung effects, nonetheless, it is reasonable to believe a cadmium concentration of approximately 1 mg/m³ over an eight hour period is "immediately dangerous" (55 FR 4052, ANSI; Ex. 8-86B).

In addition to acute lung effects and chronic renal effects, long term exposure to cadmium may cause other severe effects on the respiratory system. Reduced pulmonary function and chronic lung disease indicative of emphysema have been observed in workers who have had prolonged exposure to cadmium dust or fumes (Exs. 4-29, 4-22, 4-42, 4-50, 4-63). In a study of workers conducted by Kazantzis et al., a statistically significant excess of worker deaths due to chronic bronchitis was found, which in his opinion was directly related to high cadmium exposures of 1 mg/m³ or more (Tr. 6/8/90, pp. 156-157).

Cadmium need not be respirable to constitute a hazard. Inspirable cadmium particles that are too large to be respirable but small enough to enter the tracheobronchial region of the lung can lead to bronchoconstriction, chronic pulmonary disease, and cancer of that portion of the lung. All of these diseases have been associated with occupational exposure to cadmium (Ex. 8- 86B). Particles that are constrained by their size to the extra-thoracic regions of the respiratory system such as the nose and maxillary sinuses can be swallowed through mucociliary clearance and be absorbed into the body (ACGIH, Ex. 8-692). The impaction of these particles in the upper airways can lead to anosmia, or loss of sense of smell, which is an early indication of overexposure among workers exposed to heavy metals. This condition is commonly reported among cadmium-exposed workers (Ex. 8-86-B).

APPENDIX



I. SUBSTANCE IDENTIFICATION INORGANIC LEAD

- A Substance: Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.
- B Compounds covered by the standard: The word "lead" when used in this standard means elemental lead, all inorganic lead compounds and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.
- C Uses: Exposure to lead occurs in several different occupations in the construction industry, including demolition or salvage of structures where lead or lead-containing materials are present; removal or encapsulation of lead-containing materials, new construction, alteration, repair, or renovation of structures that contain lead or materials containing lead; installation of products containing lead. In addition, there are construction related activities where exposure to lead may occur, including transportation, disposal, storage, or containment of lead or materials containing lead on construction sites, and maintenance operations associated with construction activities.
- D Permissible exposure: The permissible exposure limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air (50 µg/m³) averaged over an 8-hour workday.
- E Action level: The standard establishes an action level of 30 micrograms of lead per cubic meter of air (30 µg/m³) averaged over an 8-hour workday. The action level triggers several ancillary provisions of the standard such as exposure monitoring, medical surveillance, and training.

II. HEALTH HAZARD DATA

- A Ways in which lead enters your body. When absorbed into your body in certain doses, lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed. Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion. A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.
- B Effects of overexposure to lead.
 - 1. Short term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short term dose of lead can lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

2. Long-term (chronic) overexposure. Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain. Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy. Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible. Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood. Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.
3. Exposure to lead throughout a working lifetime requires that a worker's blood lead level (BLL, also expressed as PbB) be maintained at or below forty micrograms per deciliter of whole blood (40 µg/dl). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 µg/dl to minimize adverse reproductive health effects to the parents and to the developing fetus. The measurement of your blood lead level (BLL) is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels are most often reported in units of milligrams (mg) or micrograms (ug) of lead (1 mg=1000 µg) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometime BLLs are expressed in the form of mg% or µg%. This is a shorthand notation for 100g, 100 ml, or dl. (Reference to BLL measurements in this standard are expressed in the form of µg/dl.)

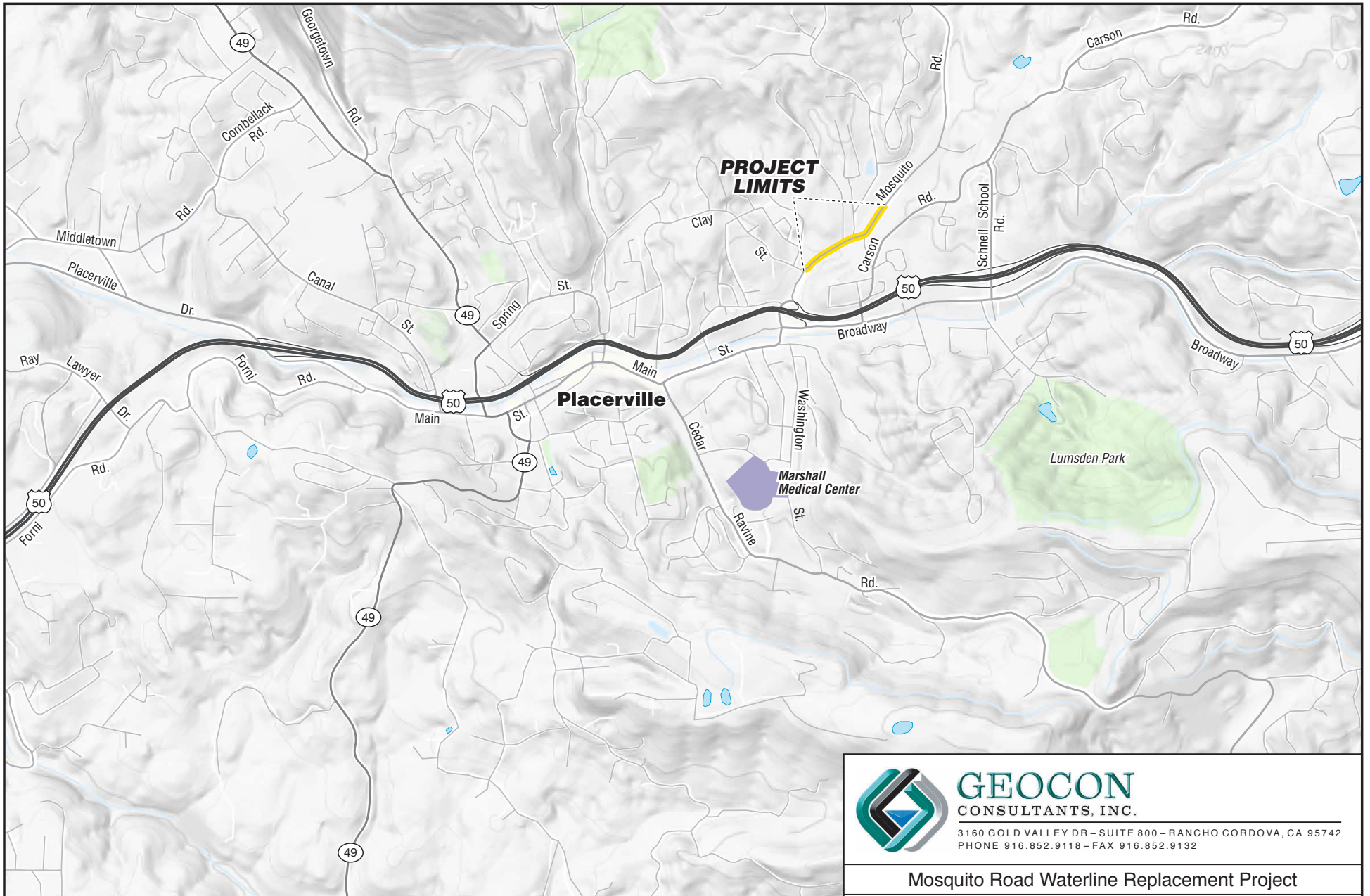
BLL measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. BLL measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between BLLs and various diseases. As a result, your BLL is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

Once your blood lead level climbs about 40 µg/dl, your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular BLL in a given person will cause a particular effect. Studies have associated fatal encephalopathy with BLLs as low as 150 µg/dl. Other studies have shown other forms of diseases in some workers with BLLs well below 80 µg/dl. Your BLL is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated BLLs. The longer

you have an elevated BLL, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage. The best way to prevent all forms of lead-related impairments and diseases -- both short term and long term -- is to maintain your BLL below 40 µg/dl. The provisions of the standard are designed with this end in mind.

Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You, as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and seeing that your employer complies with provisions governing his or her actions.

4. Reporting signs and symptoms of health problems. You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead or your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases, your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place. The standard contains a procedure whereby you can obtain a second opinion by a physician of your choice if your employer selected the initial physician.



0 1/2
Scale in Miles



GEOCON
CONSULTANTS, INC.

3160 GOLD VALLEY DR - SUITE 800 - RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 - FAX 916.852.9132

Mosquito Road Waterline Replacement Project

Mosquito Road, Clay Street to 700 feet
Northeast of Dimity Lane, Placerville, California

VICINITY MAP

S1830-03-01

September 2019

Figure 1

ANALYTE	SOIL SCREENING CRITERIA ¹		HAZARDOUS WASTE CRITERIA ²	
	Offsite Reuse ^{3,4,5} (mg/kg)	Class II Disposal (Ostrom Road) (mg/kg)	CA HAZ (Kettleman Hills)	
			TTLC (mg/kg)	STLC (mg/l)
GRO	<430	<8,000	---	---
DRO	<260	<8,000	---	---
ORO	<12,000	<25,000	---	---
Benzene	<0.33	<10 ⁷	---	---
Toluene	<1,100	---	---	---
Ethylbenzene	<5.8	---	---	---
Xylenes	<580	---	---	---
MTBE	<0.028	---	---	---
Antimony (Sb)	<31	Less than TTLC/STLC ⁸	500	15
Arsenic (As)	<0.11 ⁶		500	5.0
Barium (Ba)	<15,000		10,000	100
Beryllium (Be)	<16		75	0.75
Cadmium (Cd)	<71		100	1.0
Chromium (Cr)	<120,000		2,500	5.0
Cobalt (Co)	<23		8,000	80
Copper (Cu)	<3,100		2,500	25
Lead (Pb)	<80		1,000	5.0
Mercury (Hg)	<1.0		20	0.2
Molybdenum (Mo)	<390		3,500	350
Nickel (Ni)	<820		2,000	20
Selenium (Se)	<390		100	1.0
Silver (Ag)	<390		500	5.0
Thallium (Tl)	<0.78		700	7.0
Vanadium (V)	<390		2,400	24
Zinc (Zn)	<23,000	5,000	250	
1. This table serves as a guideline only; receiving facilities may have different requirements and/or require additional testing. 2. CCR Title 22, Division 4.5, Chapter 11, Article 3, Section 66261.24 3. ESLs = San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels for Residential, Rev. 1, January 2019. 4. HERO Note 3 screening levels = California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Note 3 screening levels for Residential, dated April 2019. 5. RSLs = United States Environmental Protection Agency Regional Screening Levels, dated May 2019. 6. Arsenic concentrations in soil will not be compared to the HERO Note 3 screening level, but to naturally occurring background concentrations ranging from 0.6 to 11 mg/kg (<i>Background Concentrations of Trace and Major Elements in California Soils by University of California</i> prepared by A.R. Bradford and others dated March1996). 7. If total concentrations equal or exceed 10mg/kg, soil must be analyzed using a toxicity characteristic leaching procedure (TCLP), and the analytical results of the soil must not exceed 0.5 mg/l to be accepted at Ostrom Road. 8. If total concentrations equal or exceed 10x STLC, a Waste Extraction Test (WET) is required and WET results cannot equal or exceed the STLC values to be accepted at Ostrom Road. mg/kg = milligrams per kilogram mg/l = milligrams per liter --- = No disposal/hazardous waste criteria CCR = California Code of Regulations TTLC = CCR Title 22 Total Threshold Limit Concentration STLC = CCR Title 22 Soluble Threshold Limit Concentration in milligrams per liter (waste extraction test)				