

# **CITY OF HEALDSBURG**



## **NOTICE TO BIDDERS, PROPOSAL, CONTRACT**

**FOR**

**CONSTRUCTION OF THE**

**CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT  
PROJECT WA004**

**CITY OF HEALDSBURG**

**BID OPENING DATE:  
FEBRUARY 29, 2024 @ 2:00PM**

**CITY OF HEALDSBURG  
ENGINEERING DEPARTMENT  
401 Grove Street**

**HEALDSBURG, CALIFORNIA 95448  
PHONE: (707) 431-3346**

## **NOTICE TO BIDDERS**

NOTICE IS HEREBY GIVEN that sealed bids will be received by the City Engineer of the City of Healdsburg at the Administration/Clerks office located at City Hall, 401 Grove Street, Healdsburg, County of Sonoma, State of California, until the hour of **2:00 p.m., on the 29th day of February, 2024**, at which time they will be publicly opened and read aloud in the chambers of the City Council, 401 Grove Street, Healdsburg, California, for:

### **CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004**

Plans and specifications may be obtained by registering for the project plan holders list on the City website project [page](#). A pdf copy of the bid package will be made available at no cost to all registered plan holders. Any bidder that is not registered for the plan holders list prior to the bid opening date shall have their bid deemed non-responsive. For questions concerning registering for the plan holders list please contact [contracts@healdsburg.gov](mailto:contracts@healdsburg.gov) or (707) 431-3160. More information can be found on the City website project page at [Healdsburg.gov/Bids](http://Healdsburg.gov/Bids).

In accordance with California Public Contract Code Section 3400, bidders may propose equals of products listed in the technical specifications or project plans by manufacturer name, brand or model number, unless the technical specifications or plans specify that the product is necessary to match others in use. Complete information for products proposed as equals must be submitted to the City Clerk's Office for review at least seven (7) working days before the time specified for bid opening in accordance with the bidders instructions contained in the bid package.

In accordance with California Public Contract Code Section 20170, all bids must be presented under sealed cover and include one of the following forms of bidder's security: cash, cashier's check made payable to the City, certified check made payable to the City, or a bidder's bond. The amount of bidder's security provided must equal at least ten (10) percent of the total of the bid price for the base bid and the additive or deductive items listed in this notice. The successful bidder must submit to the City complete, executed copies of all required documents within ten (10) working days of receiving written notice of award of the project. Bidder's security of any successful bidder that fails to do so will be forfeited to the City. Such required documents include, but are not limited to, a payment or labor and materials bond in an amount of at least 100 percent of the amount payable by the terms of the project contract and that satisfies the requirements of California Civil Code Section 9554, and a performance bond in an amount of at least 100 percent of the amount payable by the terms of the contract. All project bonds must be executed by an admitted surety insurer in accordance with applicable law and acceptable to the City.

Pursuant to the provisions of Section 1720 et seq. of the Labor Code of California, the Director of Industrial Relations for the State of California has ascertained the current general prevailing rate of wages for employer purposes, in Sonoma County, State of California. Not less than the general prevailing rate of per diem wages for work of a similar character in Sonoma County and not less than the general prevailing rate of per diem wages for holiday work fixed as provided in the California Labor Code must be paid to all workers engaged in performing the project.

In accordance with the California Labor Code Section 1773.2, copies of the applicable determinations of the Director are on file in the City of Healdsburg City Engineer's Office and may be reviewed upon request.

A **non-mandatory pre-bid meeting** is scheduled for this project on **Tuesday, February 13, 2024, at 10:00 AM** commencing at the City Corporation Yard, 550 Westside Road, Healdsburg, CA.

In accordance with California Public Contract Code Section 3300, a **valid class A California contractor's license** is required to bid on the project.

In accordance with California Public Contract Code Section 22300, except where prohibited by federal regulations or policies, the successful bidder may, on request and at its expense, substitute securities in lieu of amounts withheld by the City from progress payments to ensure performance under the contract in accordance with the contract documents.

The City of Healdsburg reserves the right to postpone the date and time for the opening of proposals at any time prior to the date and time announced in the advertisement in accordance with applicable law.

The City of Healdsburg reserves the right to reject any and all bids or to waive any defects or irregularity in bidding in accordance with applicable law. In accordance with California Public Contract Code Section 20103.8, if the City elects to award a contract for performance of the project, the contract will be awarded in accordance with California Public Contract Code Section 20162 and other applicable law to the responsible bidder submitting a responsive bid with the lowest total bid price for the base bid without consideration of the bid price for any additive or deductive items. All bids will remain valid for 90 days after the bid opening. Except as permitted by law and subject to all applicable remedies, including forfeiture of bidder's security, bidders may not withdraw their bid during the 90 day period after the bid opening.

By order of the City Council of the City of Healdsburg, Sonoma County, California.

PUBLISH: January 26, 2024, and January 31, 2024

/s/ Tyler Kettmann Date: 01/24/2024  
Central Services Manager

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# **INSTRUCTIONS TO BIDDERS**

## **1. DEFINITIONS**

- 1.1 Bid forms. The bid forms are the forms listed in the Bid Forms Section in the bid package Table of Contents.
- 1.2 Bid package. A complete bid package consists of the following documents: Notice to Bidders, Instructions to Bidders, Bidder's Check List, Proposal and Schedule of Bid Prices, Bid Bond, Contractor License Information, List of Proposed Subcontractors, Workers Compensation Insurance Certification, Acknowledgement of Indemnity and Insurance Requirements Non-collusion Affidavit, Debarment Certification, Public Contract Code Section 10285.1, Public Contract Code Section 10162 Questionnaire, Public Contract Code Section 10232 Statement, Debarment and Suspension Certification, Bidder's Signature Page, Contract Check List, Contract, Performance Bond, Payment Bond, Maintenance Bond, Escrow for Security Deposit Contract, Part 1, General Provisions, Special Provisions (if applicable), the Project Plans and Technical Specifications.
- 1.3 Contract documents. All of the documents incorporated into the final Project contract as listed in the contract.
- 1.4 Project. The Project is the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004, as described in the bid package.
- 1.5 Project Plans. The Project Plans are the primarily graphic detailed requirements concerning the Project contained in the bid package.
- 1.6 Technical Specifications. The Technical Specifications provide detailed requirements concerning the Project.

## **2. BIDDER'S REPRESENTATIONS**

Each bidder by submitting a bid represents that:

- 2.1 The bidder has read and understands the bid package and the bid is in accordance with all of the requirements of the bid package and applicable law.
- 2.2 Neither the bidder nor any subcontractor included on the list of proposed subcontractors submitted with the bid are ineligible to perform work on public works projects pursuant to California Labor Code Sections 1777.1 or 1777.7.
- 2.3 The bidder understands that quantities of unit price items may vary from the estimates provided in the Technical Specifications.
- 2.4 Representatives of the bidder have visited the Project site and have familiarized themselves with the conditions under which the Project work is to be performed so as to ensure that the Project work may be performed for the amount bid.

- 2.5 The bidder has informed the City in writing no later than five (5) working days prior to the time specified for bid opening of any apparent conflicts, errors, or ambiguities contained in the bid package or between the contents of the bid package and the Project site.

### **3. PRE-BID COMMUNICATION AND INTERPRETATION OF THE BID PACKAGE**

- 3.1 Any bidder that discovers any apparent conflicts, errors, or ambiguities contained in the bid package or between the contents of the bid package and the Project site, or that has questions or requires clarification concerning the bid package or its intent must inform the City in writing as soon as reasonably possible, but no later than five (5) working days before the date specified for bid opening. Such notice to the City must be sent to the address specified in the Notice to Bidders for questions concerning the bid package. Questions received less than five (5) working days before the time specified for opening bids may not be answered.
- 3.2 Any interpretation, correction or change of the bid package prior to bid opening will be made by addendum signed by an authorized representative of the City and transmitted to all bid package recipients. No other interpretation or information concerning the bid package issued prior to the date specified for opening bids will be binding. All addenda signed by an authorized representative of the City and issued prior to the time and date specified for opening bids will form a part of the contract documents and must be acknowledged on the bid forms. Any changes, exceptions or conditions concerning the Project and/or the bid package submitted by any bidder as part of a bid may render that bid non-responsive.

### **4. PRE-BID ACCESS TO THE PROJECT SITE**

- 4.1 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.
- 4.2 Bidders seeking to conduct any additional examination or other inquiry at the Project site must request site access from the City at least two (2) working days in advance. The location of any excavation, boring or other invasive testing will be subject to approval on behalf of the City and any other agencies with jurisdiction over such testing. Bidders may not conduct tests at the Project site prior to obtaining City approval. The City may require bidders to execute an access agreement prior to approving testing at the Project site. Once approved testing is complete, Bidders must fill all trenches or holes, restore all pavement to match existing structural section, and otherwise clean up and restore the test site to its pre-test condition.

### **5. BIDDING PROCEDURE**

- 5.1 Bids must be delivered to the City of Healdsburg, 401 Grove Street, Healdsburg, California 95448, no later than the time and date specified in the Notice to Bidders.

Bids will be opened and read publicly at that time. Bids that are submitted late according to the official time kept by the City Clerk or a designee will be returned unopened. Telephones for use by bidders are not available at the City offices.

- 5.2 In accordance with California Public Contract Code Section 20170, bids must be presented under sealed cover. Bids must be submitted using the bid forms furnished with the bid package. Bids must include all documents listed in the Bidder's Check List completed in accordance with the bid package. Bids must bear the bidder's legal name and be signed by a representative authorized to bind the bidder. Bids must be typed or written in ink. Corrections may be made if initialed by the individual signing the bid. No oral or telegraphic modifications of bids, including facsimile modifications, will be considered. Bids that are incomplete or that are not presented on the bid forms furnished with the bid package may be deemed non-responsive.
- 5.3 Each bid must give the full business address of the bidder. Bids of partnerships must furnish the full name of all partners and must be signed in the partnership name by one of the members of the partnership, or by an authorized representative, followed by the printed name and title of the person signing. Bids of corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the president, secretary or other person authorized to bind the corporation. The name of each person signing must also be typed or printed below the signature. Upon request of the City, bidders will furnish satisfactory evidence of the authority of the person signing the bid. Bids of joint ventures must include a certified copy of the legal agreement constituting the joint venture.
- 5.4 No person, firm, corporation, partnership or legal joint venture may submit more than one bid for the Project. However, a person, firm, corporation, partnership or legal joint venture that has submitted a subcontract proposal to a bidder, or that has quoted prices on materials to a bidder may submit a subcontract proposal, quote prices to other bidders and submit its own bid.
- 5.5 In accordance with California Public Contract Code Section 20170, all bids must include one of the forms of bidder's security specified in the Notice to Bidders in an amount of at least ten (10) per cent of the total of the bid prices for the base bid and those additive or deductive items specifically identified in the Notice to Bidders for the purpose of determining the lowest price bid. Bidders that elect to provide bidder's security in the form of a bid bond must execute a bid bond using the form provided in the bid forms. The bidder's security is tendered as a guarantee that the successful bidder, if issued a notice of award concerning the Project contract, will execute and submit to the City all required bonds, certificates of insurance, completed contract forms and other documents listed in the Contract Check List and enter into a contract with the City within ten (10) working days of receipt of the notice of award. The bidder's security of any successful bidder that fails to do so will be forfeited to the City. All bidders' security not forfeited to the City will be returned once a successful bidder provides all required documents and enters a contract with the City in accordance with all applicable bid package requirements. Forfeiture of the bidder's security to the City will not waive or otherwise limit any other remedy available to the City under applicable law.
- 5.6 In accordance with California Business and Professions Code Section 7028.15, Public Contract Code Section 20103.5, and as specified in the Notice to Bidders,

all Project work must be performed by properly licensed contractors and subcontractors with active licenses in good standing as of the date and time specified for bid opening, or, if the Project involves federal funds, no later than the time the Project contract is awarded. Bidders must verify their Contractor's License number and license expiration date in the proposal under penalty of perjury. Bids that do not satisfy applicable licensing requirements will be considered non-responsive and rejected and may subject the bidder to criminal and/or civil penalties.

- 5.7 Pursuant to 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 Part 7, Chapter 1 of the Labor Code., unless currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. It is not a violation of Labor Code Section 1771.1 for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Labor Code Section 1725.5 at the time the contact is awarded.
- 5.8 If the bid forms include a bidder's questionnaire, all bids must include a completed bidder's questionnaire on the forms provided. By submitting a bid, bidders authorize City representatives to verify any and all information provided on the bidder's questionnaire and agree to indemnify, defend and hold harmless the City and its officials, officers, employees, agents and volunteers to the full extent permitted by law from and against any claims, liability or causes of action, including, without limitation, legal fees and costs, arising out of verification of the information provided on the bidder's questionnaire, and/or arising out of use of information provided in the bidder's questionnaire to determine, in accordance with applicable law, the qualification of the bidder to perform the Project.
- 5.9 Bids may be withdrawn prior to the time set for bid opening by a written request signed by an authorized representative of the bidder filed with the City Clerk. The bid security submitted with bids so withdrawn will be returned to the bidder. Bidders that have withdrawn their bid in accordance with this provision may submit a new bid prior to the time set for bid opening in accordance with all applicable bid package requirements. Bids may not be withdrawn during the ninety day period after the time set for bid opening except as permitted by law pursuant to California Public Contract Code Section 5100 and following. Any other bid withdrawal will result in forfeiture of the bidder's bid security to the City.

## **6. BID PROTESTS**

- 6.1 Any protest of the proposed Project award must be submitted in writing to the City no later than 5:00 PM on the third business day following the date of the bid opening. All bids will be available for inspection by the next business day after the bid opening. All bidders have equal access to the bids. The company protesting the bid will be asked to contact the City Clerk, of the City Manager's Office, and review the bids onsite at City Hall, 401 Grove Street, Healdsburg CA 95448. The bid protest must follow the requirements listed below:
- 6.2 The protest must contain a complete statement of the basis for the protest.

- 6.3 The protest must state the facts and refer to the specific portion of the document or the specific statute that forms the basis for the protest. The protest must include the name, address, and telephone number of the person representing the protesting party.
- 6.4 The party filing the protest must concurrently transmit a copy of the protest to the proposed awardee.
- 6.5 The party filing the protest must have actually submitted a bid for the Project. A subcontractor of a party filing a bid for the Project 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.
- 6.6 The procedure and time limits set forth in these Instructions to Bidders are mandatory and are the bidders' sole and exclusive remedy in the event of a bid protest. Any bidder's failure to fully comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing of a challenge of the award pursuant to the California Public Contract Code, filing of a claim pursuant to the California Government Code, or filing of any other legal proceedings.
- 6.7 The City will review all timely protests prior to award of the Project. The City will not be required to hold an administrative hearing to consider any protests, but may do so at its option. At the time of the City Council's consideration of the Project award, the City Council will also consider the merits of any timely protests. The City Council may either reject the protest and award to the lowest responsible bidder or accept the protest and award the bid to the next lowest responsible bidder. Nothing in this section will be construed as a waiver of the City Council's right to reject all bids.

## **7. AWARD**

- 7.1 In accordance with applicable law, the City reserves the right to reject any or all bids and to waive any informality in any bid. The City reserves the right to accept any portion of any bid, unless the bid package expressly provides that the award will be made as a whole. If the City elects to award a contract for performance of the Project, the contract will be awarded in accordance with California Public Contract Code Section 20162 and other applicable law to the responsible bidder submitting a responsive bid with the lowest total bid price for the base bid and the additive or deductive alternate items listed in the Notice to Bidders. In accordance with the contract documents and applicable law, the City may add or deduct items of work from the Project after the lowest responsible bidder is determined.
- 7.2 The successful bidder must submit to the City complete, executed copies of all documents specified in the Contract Checklist within ten (10) working days of receiving written notice of award of the Project. Bidder's security of any successful bidder that fails to do so will be forfeited to the City.
- 7.3 The successful bidder and any subcontractors and others engaged in performance of the Project must have valid local business license(s), as applicable, before commencing work on the Project.

- 7.4 Upon verifying that the successful bidder has provided complete, executed copies of all documents specified in the Contract Checklist an authorized City representative will execute the Project contract, and the City will issue to the successful bidder a notice to proceed specifying the Project commencement date. The number of days within which the Project must be complete begins to run on the Project commencement date.

## **8. PRICING**

- 8.1 If an inconsistency exists between the amount listed for a unit price in a bid and the total listed for that bid item (e.g., if the total listed for a bid item does not equal the unit price listed in the bid multiplied by the quantity listed), subject to applicable law, the unit price will be deemed to accurately reflect the bidder's intent concerning the bid item and the intended total for the bid item will be deemed to be the unit price as listed in the bid multiplied by the quantity listed.
- 8.2 If the Project bid price is a lump sum total made up of smaller individual bid item prices and an inconsistency exists between the lump sum total bid price and any individual bid item price, subject to applicable law, the individual bid item prices as listed in the bid will be deemed to accurately reflect the bidder's intended bid for the Project and the intended lump sum total bid for the Project will be deemed to be the sum of the individual bid item prices as listed in the bid, even if that sum is different from the amount actually listed as the lump sum total bid for the Project.
- 8.3 Any federal, state, or local tax payable on articles to be furnished for the Project will be included in the lump sum total bid price and paid by the Contractor under the contract. The City is exempt from federal excise tax and will provide a certificate of exemption to the successful bidder upon request.

## **9. QUANTITIES**

- 9.1 Quantities, including but not limited to, material or labor quantities, that are provided in the bid package concerning the Project are estimates only and are provided solely as a general indication of the Project scope. The City does not warrant that such quantity estimates provided in the bid package represent the actual quantities required to perform the Project in accordance with the contract documents. Such quantity estimates do not bind the City, and bidders should not rely on them in preparing their bids. Each bidder is solely responsible for determining the quantities on which to base their bids in light of information contained in the bid package, bidder investigation and analysis of the Project and the Project site, and any other analysis or expertise of the bidder concerning the Project.
- 9.2 The City may amend, decrease or increase the Project work in accordance with the bid package and the contract documents. If the City amends, decreases or increases the Project work prior to award of the Project each bidder will be solely responsible for determining the revised quantities, if any, on which to base their bid in light of information contained in the bid package and any amendments or addenda to the bid package, bidder investigation and analysis of the Project as amended, decreased or increased, the Project site, and any other analysis or expertise of the bidder concerning the Project.

## **10. SUBSTITUTION OF "OR EQUAL" ITEMS**

- 10.1 In accordance with California Public Contract Code Section 3400, where the Technical Specifications or Project Plans list products by manufacturer's name, brand or model number such information indicates the quality and utility of the items desired and does not restrict bidders to that manufacturer's name, brand or model number, unless the Technical Specifications or Project Plans specify that the listed product is necessary to match others in use on a particular public improvement either completed or in the course of completion. Except where the Technical Specifications indicate that a particular brand product is necessary to match others in use, when a manufacturer's name, brand or model number is listed, it will be construed to be followed by the words "or equal" whether or not those words in fact follow the manufacturer's name, brand name or model number listed in the Technical Specifications or Project Plans. Unless the Technical Specifications or Project Plans indicate that a particular brand product is necessary to match others in use, bidders may propose equals of products listed by manufacturer name, brand name or model number.
- 10.2 Complete information for products proposed as equals must be submitted to the City for review at least seven (7) working days before the time specified for opening bids. To be considered, proposals concerning products proposed as equals must include sufficient information to permit the City to determine whether the products proposed as equals will satisfy the same performance requirements as products listed by manufacturer name, brand or model number. Such performance requirements may include, but are not limited to, size, strength, function, appearance, ease of maintenance and repair, and useful life requirements. Proposals concerning products proposed as equals that are submitted less than seven (7) days before the time specified for opening bids will not be considered. Failure to bid products specified by manufacturer name, brand name or model number where the Technical Specifications or Project Plans specify that a particular product is necessary to match others in use, or where no proposal concerning products proposed as equals has been submitted in accordance with this provision may render a bid non-responsive.

## **11. SUBCONTRACTING**

- 11.1 Bids must be in accordance with the requirements of the Subletting and Subcontracting Fair Practices, Act, California Public Contract Code Section 4100 and following. Bids must include a completed list of proposed subcontractors on the form included in the bid package. In accordance with California Public Contract Code Section 4104, completed lists of proposed subcontractors must include the name, business location, the portion (type or trade), and dollar amount of the Project work to be subcontracted for each subcontractor that will perform a portion of the Project work (including special fabrication and installation of a portion of the work) valued in excess of one half of one percent of the total Project bid price. If the Project work includes construction of streets or highways, the completed list of proposed subcontractors must include the subcontractor name, business location, type of work and dollar amount to be subcontracted for each subcontractor that will perform a portion of the Project work (including special fabrication and installation of a portion of the work) valued in excess of one half of one percent of the total Project bid price, or ten thousand dollars (\$10,000), whichever is greater.
- 11.2 In accordance with California Public Contract Code Section 4106, for any portion

of the Project work with a value of more than one half of one percent of the total Project bid price for which no subcontractor is listed, or for which more than one subcontractor is listed, bidders certify by submitting their bids that they are qualified to perform that portion of the Project work and that they will perform that portion of the Project work with their own forces. Bidders may not substitute another subcontractor for a subcontractor listed in their bid except as permitted by the City in accordance with Section 4107 and following of the California Public Contract Code.

- 11.3 The Contractor must perform with his or her own organization a value of work amounting to not less than 50% of the contract amount in accordance with Section 8-1.06 of the Contract.
- 11.4 Subcontractors must meet all applicable indemnification and insurance requirements as detailed in the Acknowledgement of Indemnity and Insurance Requirement.

## **12. ASSIGNMENT**

Bidders may not assign, sublet, sell, transfer, or otherwise dispose of their bid or any right, title or interest in their bid, or their obligations under their bid, without the written consent of an authorized representative of the City. Any purported assignment, subletting, sale, transfer or other disposition of a bid or any interest in a bid, or of any obligations under a bid without such written consent will be void and of no effect.

## **13. BONDS**

- 13.1 The successful bidder must submit to the City a performance bond within ten working days of receiving written notice of award. If the Project involves expenditures in excess of twenty five thousand dollars (\$25,000), the successful bidder must submit to the City a payment or labor and materials bond within 10 days of the date of mailing of the notice of award. Prior to issuance of the final Project payment, the successful bidder must submit a warranty or maintenance bond. All bonds must be executed by corporate sureties who are admitted surety insurers in the State of California in accordance with applicable law and acceptable to the City. Individual sureties will not be accepted. All Project bonds must be executed using the forms provided in the bid package.
- 13.2 In accordance with California Civil Code Section 9554, the payment or labor and materials bond must be in the amount of one hundred percent of the total amount payable by the terms of the Project contract and guarantee payment to persons listed in California Civil Code Section 9100(a) for work performed and for charges for materials, supplies, and equipment provided under the Project contract (including amounts due under or subject to the Unemployment Insurance Code) in accordance with the requirements of California Civil Code Section 9554.
- 13.3 The performance bond must be in the amount of one hundred percent of the amount payable by the terms of the Project contract to guarantee the faithful performance of the Project work.
- 13.4 The warranty or maintenance bond must be in the amount of ten percent of the final Project contract amount and guaranty the Project work against defects in materials, equipment, workmanship, or needed repair for one year from the City's

acceptance of the Project work. A warranty or maintenance bond that meets these requirements must be submitted to the City prior to issuance of final Project payment.

#### **14. LABOR LAWS**

- 14.1 Bidders must comply with applicable provisions of the California Labor Code.
- 14.2 In accordance with California Labor Code Section 1861, bids must include a workers compensation insurance certification on the form included in the bid package.
- 14.3 In accordance with California Labor Code Section 1771, not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Project is to be performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed as provided in the California Labor Code must be paid to all workers engaged in performing the Project.
- 14.4 In accordance with California Labor Code Part 7, Chapter 1m Article 2, Sections 1770, 1773, and 1173.2 and following, the Director of Industrial Relations has determined the general prevailing wage per diem rates for work in the locality in which the Project is to be performed. In accordance with California Labor Code Section 1773, the City has obtained the general prevailing rate of per diem wages and the general rate for holiday and overtime work in the locality in which the Project is to be performed for each craft, classification or type of worker needed to perform the Project. In accordance with California Labor Code Section 1773.2, copies of the prevailing rate of per diem wages are on file at the City offices and will be made available on request. The Contractor can also download this information from the website: <http://www.dir.ca.gov/dlsr/PWD/>.
- 14.5 In accordance with California Labor Code Section 1777.1, contractors and subcontractors that are found guilty of willfully violating Chapter 1 of Part 7 of Division 2 of the Labor Code (except for Section 1777.5), or that are found guilty of such violations with intent to defraud, and entities in which such contractors or subcontractors have any interest, may be ineligible to bid on, be awarded, or perform Project work as a subcontractor.
- 14.6 Pursuant to, 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 Part 7, Chapter 1 of the Labor Code, unless currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. It is not a violation of Labor Code Section 1771.1 for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Labor Code Section 1725.5 at the time the contact is awarded.

## **BIDDER'S CHECK LIST**

Did You:

- \_\_\_\_\_ Submit equal product proposals, if any, in accordance with the instructions to bidders included in the bid package at least 7 days before the time specified for bid opening?
  
- \_\_\_\_\_ Include with your bid properly completed, accurate copies of the following documents in the following order using the forms included in the bid package:
  - \_\_\_\_\_ Bidder's check list
  
  - \_\_\_\_\_ Proposal and Schedule of Bid Prices that state the bid as intended
  
  - \_\_\_\_\_ Copies of each addendum issued signed and dated on behalf of the bidder
  
  - \_\_\_\_\_ Executed bid bond
  
  - \_\_\_\_\_ Contractor license information
  
  - \_\_\_\_\_ List of subcontractors
  
  - \_\_\_\_\_ Signed Workers compensation insurance certification
  
  - \_\_\_\_\_ Signed Debarment certifications
  
  - \_\_\_\_\_ Signed Acknowledgment of Indemnity and Insurance Requirements
  
  - \_\_\_\_\_ Signed non-collusion affidavit
  
  - \_\_\_\_\_ Bidder's questionnaire
  
  - \_\_\_\_\_ Public Contract Code Section 10285.1 Statement
  
  - \_\_\_\_\_ Public Contract Code Section 10162 Questionnaire
  
  - \_\_\_\_\_ Public Contract Code Section 10232 Statement
  
  - \_\_\_\_\_ Executed bidder's signature page
  
- \_\_\_\_\_ Arrange to have the sealed bid delivered to the City of Healdsburg offices at 401 Grove Street, Healdsburg, California, 95448 on or before **2:00 p.m. on Thursday, February 29, 2024**

## PROPOSAL

For: Construction of CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004

For the City of Healdsburg, Sonoma County, California.

### TO THE HONORABLE CITY COUNCIL OF THE CITY OF HEALDSBURG

The undersigned, as bidder, declares that he has carefully examined the work, the annexed proposed form of contract, and agrees that if this Proposal is accepted that he will contract with the City of Healdsburg, under the form of contract annexed of hereto, to provide all the necessary tools, apparatus, and other means of accomplishing the work as specified in the contract in the manner and time herein prescribed, and in accordance with the requirements of the Engineer as therein set forth, and he will take in full payment therefore the following prices for the work to be done completely performed to the satisfaction of the City of Healdsburg, to-wit:

#### Base Bid

Item No.	Item Description	Estimated Quantity	Unit of Measure	Unit Cost (in figures)	Total Cost (in figures)
1	Mobilization and Demobilization	1	LS		
2	Traffic Control	1	LS		
3	Storm Water Pollution Prevention	1	LS		
4	Sheeting, Shoring and Bracing	1	LS		
5	Dewatering	1	LS		
6	Install 4-inch C900 PVC by Open-Cut – Station 50+00 to Station 56+78	678	LF		
7	Install 12-inch C900 PVC by Open-Cut – Station 10+17 to Station 20+58	1,041	LF		
8	Install 12-inch C900 PVC by Open-Cut – Station 22+20 to Station 46+32	2,412	LF		
9	Install 12-inch C900 PVC by Open-Cut – Station 48+35 to Station 80+09	3,174	LF		
10	Install 12-inch C900 PVC by Open-Cut – Station 20+00 to Station 41+02	2,102	LF		
11	Install 12-inch C900 PVC by Open-Cut – Station 80+09 to 89+58	949	LF		
12	Install 3-inch Recycled Water Service – Giorgi Park	1	EA		

Item No.	Item Description	Estimated Quantity	Unit of Measure	Unit Cost (in figures)	Total Cost (in figures)
13	Install 3-inch Recycled Water Service – Oak Mound Cemetery North	1	EA		
14	Install 3-inch Recycled Water Service – Oak Mound Cemetery South	1	EA		
15	Install 3-inch Recycled Water Service - Healdsburg Elementary	1	EA		
16	Install 3-inch Recycled Water Service - Recreation Park	1	EA		
17	Install 4-inch Recycled Water Service – Golf Course	1	EA		
18	Install 12-inch Gate Valve	12	EA		
19	Install 4-inch Gate Valve	1	EA		
20	Install Bulk Fill Station	1	EA		
21	Install Jacking Pit	1	LS		
22	Install Receiving Pit	1	LS		
23	Install 36" Casing by Auger Bore and Jack with Carrier Pipe	162	LF		
24	Install 1" Combination Air Valve Assembly	13	EA		
25	Install Blow Off Assembly	3	EA		
26	Install Backflow Preventer	2	EA		
27	Settlement Monitoring	1	LS		
28	Pressure Testing	1	LS		
29	Asphalt Restoration	1,210	TON		
30	Demolition and Construction Debris Disposal / Recycling	1	LS		
31	Stand-by Time as Directed by the Engineer	8	HRS		
32	Water Crossing over or under a Structure not shown on Plans	10	EA		
33	Over Excavation and Fill with Filter Fabric Wrapped Drain Rock as Directed by the Engineer	50	CY		

Item No.	Item Description	Estimated Quantity	Unit of Measure	Unit Cost (in figures)	Total Cost (in figures)
34	Sawcut and Remove Portland Cement Concrete Pavement as Directed by the Engineer	200	CY		

Total Base Bid \$ \_\_\_\_\_

Written in words \_\_\_\_\_

The undersigned further agrees to deliver and to complete the same within **412 calendar days**, from the date of issuance, by the Engineer, of instructions to proceed with the work, and within 10 days of the date of mailing of the notice of award, to enter into and execute and provide to the City the necessary contract with the necessary bonds and other required documents, and in case of default in executing the necessary contract within the time fixed by the Instructions to Bidders, the bidder's security accompanying this bid will become the property of and be forfeited to the City of Healdsburg.

Prime Contractor \_\_\_\_\_

License # \_\_\_\_\_ Expiration Date: \_\_\_\_\_

DIR# \_\_\_\_\_

Name of person submitting bid: \_\_\_\_\_ Email: \_\_\_\_\_

The Contractor's license number and expiration date are herein stated under penalty of perjury.

By: \_\_\_\_\_ Title: \_\_\_\_\_

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

-----  
**CORPORATION**

(Corporate Seal)

**Corporate signature**

\_\_\_\_\_

Address: \_\_\_\_\_

Phone No.: \_\_\_\_\_

President's signature \_\_\_\_\_

Secretary's signature \_\_\_\_\_

Corporation organized under the laws of the State of \_\_\_\_\_

-----  
**PARTNERSHIP**

**Partnership Name:** \_\_\_\_\_

Address: \_\_\_\_\_

Names of Co-Partners and Addresses: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
-----

*SOLE PROPRIETORSHIP*

**Names of Individuals and Addresses:** \_\_\_\_\_  
\_\_\_\_\_

*NOTE: Sign in proper space above.*

CITY OF HEALDSBURG  
Healdsburg, California 95448

**BID BOND**

*(NOTE: Bidders must use this form, use of any other bond form may render a bid non-responsive)*

KNOW ALL MEN BY THESE PRESENTS:

That we, as PRINCIPAL, and \_\_\_\_\_, a (sole proprietorship/corporation/partnership/joint venture) organized and existing under and by virtue of the laws of the State of \_\_\_\_\_ and an admitted surety insurer authorized to do business in the State of California, as SURETY, are held and firmly bound unto the City of Healdsburg, as OBLIGEE, in a penal sum equal to ten-percent (10%) of the total bid price including the base bid and alternates specified in the proposal of the PRINCIPAL, to the OBLIGEE for the work described below, which penal sum is \_\_\_\_\_ (\$ \_\_\_\_\_) lawful money of the United States of America, for the payment of which sum well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the PRINCIPAL has submitted the accompanying proposal dated \_\_\_\_\_, \_\_\_\_\_ to the OBLIGEE, for the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004 (designated as the "Project") which proposal is hereby made a part hereof;

NOW THEREFORE, if the PRINCIPAL shall not withdraw said proposal within the ninety (90) day period following the opening of bids, and if the PRINCIPAL receives written notice concerning award of the Project to the PRINCIPAL and shall, within ten (10) calendar days of receiving such notice: enter into a written contract with the OBLIGEE in the form prescribed in the bid package issued by the OBLIGEE concerning the Project; and give insurance and bond with good and sufficient sureties guaranteeing the faithful performance and proper fulfillment of such contract and guaranteeing payment for labor and materials used for performance of the contract as required by law; and file with the OBLIGEE all required documents and do all other thing required in accordance with the bid package issued by the OBLIGEE concerning the Project for the contract between the PRINCIPAL and the OBLIGEE to become effective and for work to commence in accordance with the bid package issued by the OBLIGEE concerning the Project, or, in the event of withdrawal of the accompanying proposal within the ninety (90) day period following the opening of bids; or failure by the PRINCIPAL to enter into such contract with the OBLIGEE or to give the OBLIGEE such bonds or to file any other documents or to do any other things required in the bid package issued by the OBLIGEE for the Project, if the PRINCIPAL shall pay the OBLIGEE the difference between the total bid price in the accompanying proposal and the amount for which the OBLIGEE may procure the required performance, if the latter amount be in excess of the former, together with all costs incurred by the OBLIGEE in again attempting to let the Project, and if the said PRINCIPAL shall fully reimburse and save harmless the OBLIGEE from any damage sustained by the OBLIGEE through failure of the PRINCIPAL to enter into the written contract or to file the required performance or labor and material bonds, or to file any other required documents or to do any other things required for the contract between the PRINCIPAL and the OBLIGEE to become effective and the work to commence in accordance with the bid package issued by the OBLIGEE concerning the Project, then this obligation shall be null and void; otherwise, it shall be and remain in full force and effect.

SURETY, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the bid or contract documents for the Project, or to the specifications included in the same, or to the work to be performed thereunder, or to the notice to bidders, or to any other documents concerning the Project, shall in anywise affect SURETY's obligation under this bond, and SURETY hereby waives notice of any such change, extension of time, alteration or addition to such bid or contract documents.

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, the above-bound parties have executed this instrument under their several seals this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, the name and corporate seals of each corporate party being hereto affixed and these presents duly signed by their undersigned representatives, pursuant to authority of their governing bodies.

(Corporate Seal)

PRINCIPAL \_\_\_\_\_  
By \_\_\_\_\_

(Acknowledgement)

Title \_\_\_\_\_  
SURETY \_\_\_\_\_

(Corporate Seal)

By \_\_\_\_\_  
(Attorney-in-fact)

(Acknowledgement)

Title \_\_\_\_\_

*(NOTE TO SURETY COMPANY: A certified copy of unrevoked resolution of authority for the attorney-in-fact must be submitted with and attached to the executed bid bond.)*

## CONTRACTOR LICENSE INFORMATION

The bidder acknowledges that the license required for performance of the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004 is an A.

The bidder holds the following California Contractors License(s):

1. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_
2. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_
3. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_
4. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_
5. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_
6. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_
7. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_
8. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_
9. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_
10. License No. \_\_\_\_\_, Class \_\_\_\_\_, Expiration Date \_\_\_\_\_

Bidder's Taxpayer Identification No. \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

## LIST OF SUBCONTRACTORS

In accordance with the requirements of the Subletting and Subcontracting Fair Practices, Act, California Public Contract Code Section 4100 and following, listed below are the name, business location, and the portion (type or trade) of the Project work to be subcontracted to each subcontractor that will perform a portion of the Project work (including special fabrication and installation of a portion of the work) valued in excess of one half of one percent of the total bid price. If the Project work includes construction of streets or highways, listed below are the name, business location, and the portion (type or trade) of the Project work to be subcontracted to each subcontractor that will perform a portion of the Project work (including special fabrication and installation of a portion of the work) valued in excess of one half of one percent of the total Project bid price, or ten thousand dollars, whichever is greater. Also listed below are the proposed subcontract dollar amount and current California Contractor's License Number(s) for each proposed subcontractor. Bids that fail to include complete proposed subcontractor information in accordance with this form and Public Contract Code Section 4100 and following may be deemed non-responsive.

In accordance with California Public Contract Code Section 4106, for any portion of the Project work with a value of more than one half of one percent of the total bid price for which no subcontractor is listed, or for which more than one subcontractor is listed, the bidder certifies by submission of its bid that the bidder is qualified to perform that portion of the Project work and that the bidder will perform that portion of the Project work with its own forces. The penalties listed in California Public Contract Code Section 4111 will apply to any substitution of another subcontractor for a subcontractor listed below except as permitted by the City in accordance with Section 4107 and following of the California Public Contract Code.

The Contractor must perform with his or her own organization, a value of work amounting to not less than fifty percent (50%) of the contract amount, except that the bid amount for "Specialty Items" so designated in any Special Provisions if included may be eliminated from the contract amount and not considered as sub-contracted for the purposes of calculating the value of work to be performed by the Contractor. For the purposes of determining the value of work to be performed by the Contractor pursuant to this provision, materials, equipment, incidentals, etc., shall be considered to have been purchased by the contractor or subcontractor that is to install them. Where a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated cost of such portion of the subcontracted item, as determined from information submitted by the Contractor, subject to approval by the Engineer.

1. Subcontractor Name \_\_\_\_\_  
Business Location \_\_\_\_\_  
Trade \_\_\_\_\_  
Subcontract Amount \_\_\_\_\_  
Current Contractor's License No.(s) \_\_\_\_\_  
Public Works Contractor DIR Registration # \_\_\_\_\_
  
2. Subcontractor Name \_\_\_\_\_  
Business Location \_\_\_\_\_  
Trade \_\_\_\_\_  
Subcontract Amount \_\_\_\_\_  
Current Contractor's License No.(s) \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

3. Subcontractor Name \_\_\_\_\_

Business Location \_\_\_\_\_

Trade \_\_\_\_\_

Subcontract Amount \_\_\_\_\_

Current Contractor's License No.(s) \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

4. Subcontractor Name \_\_\_\_\_

Business Location \_\_\_\_\_

Trade \_\_\_\_\_

Subcontract Amount \_\_\_\_\_

Current Contractor's License No.(s) \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

5. Subcontractor Name \_\_\_\_\_

Business Location \_\_\_\_\_

Trade \_\_\_\_\_

Subcontract Amount \_\_\_\_\_

Current Contractor's License No.(s) \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

6. Subcontractor Name \_\_\_\_\_

Business Location \_\_\_\_\_

Trade \_\_\_\_\_

Subcontract Amount \_\_\_\_\_

Current Contractor's License No.(s) \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

7. Subcontractor Name \_\_\_\_\_

Business Location \_\_\_\_\_

Trade \_\_\_\_\_

Subcontract Amount \_\_\_\_\_

Current Contractor's License No.(s) \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

8. Subcontractor Name \_\_\_\_\_

Business Location \_\_\_\_\_

Trade \_\_\_\_\_

Subcontract Amount \_\_\_\_\_

Current Contractor's License No.(s) \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

9. Subcontractor Name \_\_\_\_\_

Business Location \_\_\_\_\_

Trade \_\_\_\_\_

Subcontract Amount \_\_\_\_\_

Current Contractor's License No.(s) \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

10. Subcontractor Name \_\_\_\_\_

Business Location \_\_\_\_\_

Trade \_\_\_\_\_

Subcontract Amount \_\_\_\_\_

Current Contractor's License No.(s) \_\_\_\_\_

Public Works Contractor DIR Registration # \_\_\_\_\_

# **NON-COLLUSION DECLARATION**

## **TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID**

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

The undersigned declares:

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

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

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on \_\_\_\_\_, at \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Signature of Bidder

2387815.1

# Municipal Recycled Water Pipeline Project Bidder's Questionnaire

(attach additional pages as needed)

## Contractor's Engineer

Excavation Support Engineer

Name and Profession Registration. \_\_\_\_\_

Years of Experience. \_\_\_\_\_

Geotechnical Instrumentation Engineer (If Different)

Name and Profession Registration. \_\_\_\_\_

Years of Experience. \_\_\_\_\_

## Contractor's Surveyor

Name and Professional Registration \_\_\_\_\_

Years of Experience \_\_\_\_\_

## Shoring Installer Qualifications

1 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

2 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

3 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

4 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

5 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

## Contractor's Materials and Compaction Testing Firm

Name \_\_\_\_\_

Telephone Number / E-mail \_\_\_\_\_

## Horizontal Auger Boring Contractor

Firm Name \_\_\_\_\_

1 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

2 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

3 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

Proposed Superintendent \_\_\_\_\_

Superintendent Years of Experience \_\_\_\_\_

Proposed Operator Name \_\_\_\_\_

Operator Years of Experience \_\_\_\_\_

**Carrier Pipe Installer**

Firm Name \_\_\_\_\_

1 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

2 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

3 Project Name \_\_\_\_\_

Client Name \_\_\_\_\_

Contact Telephone Number / E-mail \_\_\_\_\_

Proposed Superintendent \_\_\_\_\_

Superintendent Years of Experience \_\_\_\_\_

## **WORKERS COMPENSATION INSURANCE CERTIFICATION**

By submitting its bid the bidder certifies as follows:

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

## **DEBARMENT CERTIFICATION**

By submitting its bid the bidder certifies in accordance with California Public Contract Code Section 6109 that neither the bidder nor any subcontractor included on the list of proposed subcontractors submitted with the bid is ineligible to perform work on public works projects pursuant to California Labor Code Sections 1777.1 or 1777.7. In accordance with California Public Contract Code Section 6109, contractors and subcontractors who are ineligible to perform work on public works projects pursuant to California Labor Code Sections 1777.1 or 1777.7 may neither bid on, be awarded or perform as a subcontractor on public works projects.

---

Signature of Bidder

---

Printed Name

## ACKNOWLEDGMENT OF INDEMNITY AND INSURANCE REQUIREMENTS

### Insurance

- a. All required insurance must be provided in the form of “occurrence”-type policies underwritten by admitted insurers in the State of California with a rating of A or better from the current year Best Rating Guide. All policies must be issued at the expense of the Contractor and must be maintained at the Contractor’s expense throughout the performance of the Work. Contractor shall maintain insurance as required by this contract to the fullest amount allowed by law and shall maintain insurance for a minimum of five years following the completion of this project. In the event contractor fails to obtain or maintain completed operations coverage as required by this Contract, the City at its sole discretion may purchase the coverage required and the cost will be paid by Contractor.
- b. Contractor agrees to include with all subcontractors in their subcontract the same requirements and provisions of this contract including the indemnity and Insurance requirements to the extent they apply to the scope of the Subcontractor’s work. Contractor shall require all sub-contractors to provide a valid certificate of insurance and the required endorsements included in the Contract prior to commencement of any work and Contractor will provide proof of compliance, upon request, to the City.
- c. Subcontractor hired by the Contractor agree to be bound to the Contractor and the City in the same manner and to the same extent as Contractor is bound to the City under the Contract. Subcontractor further agrees to include the same requirements and provisions of this Contract, including the Indemnity and Insurance requirements, with any Subcontractor to the extent they apply to the scope of the Subcontractor's work. A copy of the Contract Indemnity and Insurance provisions will be furnished to the Subcontractor upon request
- d. The Contractor and any Subcontractors engaged in performance of the Work must secure payment of workers compensation in accordance with California Labor Code Section 3700 and other applicable law. The Contractor must verify that all Subcontractors comply with this requirement.
- e. Within ten working days following the Notice of Award, the Contractor must submit to the City acceptable certificates of insurance, declarations page(s) and endorsements evidencing that the Contractor has the required insurance in effect and will maintain it throughout the performance of the Work and beyond, as applicable, the following kinds and amounts of insurance:

1. The minimum limits of the Commercial General Liability (including bodily injury, personal injury and property damage) insurance shall be:

\$10,000,000 aggregate

\$5,000,000 occurrence

If the work to be performed involves any excavation, the policy shall include an endorsement that affords coverage for explosion, collapse and underground hazards.

2. If the work to be performed involves vehicles or vehicular equipment, the Automobile insurance limit shall be:  
\$5,000,000 per accident for bodily injury and property damage

3. Automobile coverage should be at least as broad as Insurance Services Automobile Liability form CA 0001 Code 1 (“any auto”). No endorsement may be attached limiting the coverage. Anything less than ‘any auto’ coverage must be approved by the Risk Manager prior to approval. If the Risk Manager accepts anything less than ‘any auto’, additional information such as a schedule of covered autos, proof of personal auto liability coverage, or a verification statement may be required by the City.

4. Worker’s Compensation Insurance. Proof of Workers Compensation and Employers Liability insurance as required by any applicable law, regulation or statute, including the provisions of Division IV of the Labor Code of the State of California, and any act or acts amending it. Worker's compensation insurance must be for Statutory Limits and must cover the full liability of the Contractor. The Contractor’s Employer’s Liability Insurance must be in an amount no less than \$1,000,000.00 per occurrence. The workers’ compensation policy is to be endorsed with a waiver of subrogation. The insurance company, in its endorsement, must agree to waive all rights of subrogation against the City, its officers, officials, employees and volunteers for losses paid under the terms of such policy.

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

f. Additional Requirements

- i. Endorsements must add the City, its officials, officers, employees, agents and volunteers as an additional insured (“Additional Insured”). Examples of City approved insurance forms are included in this package. If the Contractor provides policy pages or broad forms of endorsement the insurance carrier will be asked to sign, initial and date all applicable sections of the document which conveys coverage to the City.
- ii. It shall be a requirement under this Contract that any available insurance proceeds broader than or in excess of the specified minimum Insurance coverage requirements and/or limits shall be available to the Additional Insured. Furthermore, the requirements for coverage and limits shall be (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any Insurance policy or proceeds available to the name insured; whichever ever greater.
- iii. The Additional Insured coverage under the Contractor’s policy shall be “primary and non-contributory” and will not seek contribution from the City of Healdsburg’s insurance or self-insurance and shall be at least as broad as CG 20 01 04 013.

- iv. The Contractor shall provide the City with a 30 day written notice of any reduction or cancellation of such insurance required to be furnished by the Contractor; and include a severability of interest clause acceptable to the City and if requested by the City.
  - v. If an Umbrella or Excess Policy is used to satisfy the requirements, than an email or language stating such on the certificate must be provided from the insurance carrier/broker and that the Umbrella/Excess Policy 'follows form' or is 'continuous' to the General liability and/ Auto liability policy in addition to the required endorsement.
  - vi. The City has included examples of approved standard and preferred forms of endorsements in the Contract. If the Contractor's insurance carrier chooses to use forms other than the City's approved forms , such forms shall be subject to the prior approval of the City. If the Contractor provides policy pages instead of an endorsement the insurance agent/broker will be asked to sign, initial and date all applicable sections of the policy that meet the City's insurance requirements.
- g. All self-insured retentions (SIR) must be disclosed to City for approval and shall not reduce the limits of liability. Policies containing any self-insured retention (SIR) provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named Insured or the City, The City reserves the right to obtain a full certified copy of any Insurance policy and endorsements. Failure to exercise this right shall not constitute a waiver of right exercise later.

**Contractor's failure to provide insurance certificates and endorsement forms that are acceptable to the City within ten (10) days of notice of award of contract shall:**

- (i) constitute a failure to complete the "Contract Documents Checklist" as described on page 36
  - (ii) entitle the City to rescind any contract award
  - (iii) result in a forfeiture of Contractor's bid bond or other form of bid security.
- a. Contractor must continue to provide approved forms of insurance certificates, declarations page(s) and endorsements that meet the requirements of Section 8-1.07 of the Contract Documents for 2 years (To be completed by Risk Management) following recordation of a Notice of Completion or other form of notice of project completion provided by City.

## Indemnities

- a. The Contractor will take all responsibility for the Work, and will bear all losses and damages directly or indirectly resulting to the Contractor, any subcontractors engaged in performance of the Work, the City, its officials, officers, employees, agents, volunteers and consultants, and to third parties on account of the performance or character of the Work, unforeseen difficulties, accidents, or occurrences of other causes predicated on active or passive negligence of the Contractor or of any subcontractor engaged in performance of the Work. To the fullest extent permitted by law the Contractor will indemnify, defend and hold harmless the City, its officials, officers, employees, agents, volunteers and consultants from and against any or all loss, liability, expense, claims, costs (including costs of defense), suits, and damages of every kind, nature and description (including, but not limited to, penalties resulting from exposure to hazards in violation of the California Labor Code) directly or indirectly arising from the performance of the Work ("Claims"). The Contractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this agreement for the full period of time allowed by law.
- b. The Contractor will indemnify, defend and hold harmless the City, the City's officials, officers, employees, volunteers, agents and the Engineer and the Architect for all liability on account of any patent rights, copyrights, trade names or other intellectual property rights that may apply to the Contractor's performance of the Work. The Contractor will pay all royalties or other charges as a result of intellectual property rights that may apply to methods, types of construction, processes, materials, or equipment used in the performance of the Work, and will furnish written assurance satisfactory to the City that any such charges have been paid.
- c. The Contractor assumes all liability for any accident or accidents resulting to any person or property as a result of inadequate protective devices for the prevention of accidents in connection with the performance of the Work. The Contractor will indemnify, defend, and hold harmless the City and its officials, officers, employees, agents, volunteers and consultants from such liability.
- d. The defense and indemnification obligations in this Contract are undertaken in addition to, and shall not in any way be limited by the insurance obligations contained in this Agreement. Sections 8-1.08 or 8-1.09. The Contractor will defend, with legal counsel reasonably acceptable to the City, any action or actions filed in connection with any Claims and will pay all related costs and expenses, including attorney's fees incurred. The Contractor will promptly pay any judgment rendered against the City, its officials, officers, employees, agents, volunteers or consultants for any Claims. In the event the City, its officials, officers, employees, agents, volunteers or consultants is made a party to any action or proceeding filed or prosecuted against Contractor for any Claims, Contractor agrees to pay the City, its officials, officers, employees, agents, volunteers and consultants any and all costs and expenses incurred in such action or proceeding, including but not limited to, reasonable attorneys' fees.
- e. Subject to the requirements of Section 5 of the General Provisions, the Contractor will indemnify, hold harmless and defend with legal counsel reasonably acceptable to the City the City and its officials, officers, employees, agents and volunteers

from and against any and all Claims related to damage to surface or underground facilities caused by the Contractor or any of the Contractor's privities or agents.

- f. The Contractor will indemnify, hold harmless and defend with legal counsel reasonably acceptable to the City the City and its officials, officers, employees, agents and volunteers from and against any and all Claims, including any fines or other penalties, related to failure of the Contractor and/or privities or agents of the Contractor to comply with the requirements of the General Permit, or to implement the SWPPP in accordance with provision 12-1.04 of the Contract. The City may withhold from amounts due or that may become due the Contractor under this Contract amounts that equal or are estimated to equal the amount of Claims, including fines, resulting from failure of the Contractor and/or privities or agents of the Contractor to comply with the requirements of the General Permit, or to implement the SWPPP in accordance with provision 12-1.04 of the Contract.
  
- g. In accordance with California Civil Code Section 2782(a), nothing in the Contract will be construed to indemnify the City for its sole negligence, willful misconduct, or for defects in design furnished by City. In accordance with California Civil Code Section 2782(b), nothing in the Contract will be construed to impose on the Contractor or to relieve the City from liability for the City's active negligence. By execution of the Contract Documents the Contractor acknowledges and agrees that the Contractor has read and understands the insurance and indemnity requirements of the Contract Documents, which are material elements of consideration.
  
- h. Contractor's and subcontractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Contract for the full period of time allowed by law.
  
- i. The defense and indemnification obligations of this Contract are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Contract.

**I have read, understand and agree to comply with the Indemnity and Insurance requirements supplied with this notice to bidders.**

---

Signature of Bidder

---

Printed Name

**TITLE 49, CODE OF FEDERAL REGULATIONS - PART 29**  
**DEBARMENT AND SUSPENSION CERTIFICATION**

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any person associated therewith in the capacity of City, partner, director, officer, manager:

1. Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;
2. Has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal Agency within the past 3 years;
3. Does not have a proposed debarment pending; and,
4. Has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space:

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Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

---

Signature of Bidder

---

Printed Name

## **PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT**

In accordance with Public Contract Code Section 10285.1 (Chapter 376, Stats, 1986), 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 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 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 blank spaces provided.

The above Statement is part of the Proposal.

Bidders are cautioned that making false certification may subject the certifier to criminal prosecution.

---

Signature of Bidder

---

Printed Name

## **PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE**

In accordance 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.

---

Signature of Bidder

---

Printed Name

## **PUBLIC CONTRACT SECTION 10232 STATEMENT**

In accordance 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.

---

Signature of Bidder

---

Printed Name

## **BIDDER'S SIGNATURE PAGE**

By signing this proposal the bidder certifies, under penalty of perjury under the laws of the State of California, that the information submitted with this proposal for the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004 ("Project"), which information includes, but is not limited to, the Bidder's Check List, Proposal and Schedule of Bid Prices, Bid Bond, Contractor License Information, List of Subcontractors, Workers Compensation Insurance Certification, Non-collusion Affidavit, Debarment Certification, Debarment and Suspension Certification, Public Contract Code Section 10285.1 Statement, Public Contract Code Section 10162 Questionnaire, and Public Contract Code Section 10232 Statement, is accurate, true and correct, and is submitted in accordance with the requirements of the bid package issued by the City of Healdsburg concerning the Project and applicable law. By signing this proposal the bidder representative specified below certifies that he or she is legally authorized to bind the bidder.

The bidder agrees to deliver and to complete the Project within (working time) **412 calendar days** from the date of issuance, by the Engineer, of instructions to proceed with the Project, and within 10 days of the date of mailing of the notice concerning the award, to enter into and execute and provide to the City the Project contract, bonds and all other documents specified in the Contract Check List included in the bid package, and in case of default in executing the Project contract within the time fixed by the Instructions to Bidders, the bidder's security accompanying this bid shall become the property of and be forfeited to the City of Healdsburg.

Prime Contractor \_\_\_\_\_

By: \_\_\_\_\_ Title: \_\_\_\_\_

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 2024

(Corporate Seal)

Corporate signature

\_\_\_\_\_

Address: \_\_\_\_\_

Phone No.: \_\_\_\_\_

President's signature \_\_\_\_\_

Secretary's signature \_\_\_\_\_

Corporation organized under the laws of the State of \_\_\_\_\_

Partnership Name: \_\_\_\_\_

Address: \_\_\_\_\_

Names of Co-Partners and Addresses:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Names of Individuals and Addresses:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NOTE: Sign in proper space above.

Date: \_\_\_\_\_

\_\_\_\_\_  
(Typed or printed name)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Bidder)

Bidder business address (street, city, state and zip code)

\_\_\_\_\_  
\_\_\_\_\_

Bidder Business phone: (    ) \_\_\_\_\_

Bidder Business fax: (    ) \_\_\_\_\_

## **CONTRACT DOCUMENTS CHECK LIST**

Complete, accurate, executed copies of the following documents must be submitted to the City of Healdsburg in accordance with the bid package issued by the City within ten (10) working days of receiving written notice concerning award of the project. The bidder's security of any successful bidder that fails to do so will be forfeited to the City.

- \_\_\_\_\_ Contract, Part 1
- \_\_\_\_\_ Performance Bond
- \_\_\_\_\_ Payment Bond
- \_\_\_\_\_ Certificates of Insurance, Declarations page(s) and Endorsements
- \_\_\_\_\_ Escrow for Deposit Agreement, if applicable
- \_\_\_\_\_ General Conditions, Contract, Part 2
- \_\_\_\_\_ Special Provision (if included)
- \_\_\_\_\_ Technical Specifications
- \_\_\_\_\_ Project Plans
- \_\_\_\_\_ Contractor Safety Program
- \_\_\_\_\_ Report of Use/Storage of Hazardous Substances



# CONTRACT PART 1

This Contract is made and entered into this (to be completed by the City) \_\_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Healdsburg, a California Municipal Corporation, 401 Grove Street, Healdsburg, California, 95448, hereinafter referred to as "City," and \_\_\_\_\_, a \_\_\_\_\_, hereinafter referred to as "Contractor"

## RECITALS

A. NOTICE INVITING BIDS. The City gave notice inviting bids to be submitted by \_\_\_\_\_ for the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004 by published notice and/or posting in accordance with California Public Contract Code Section 20164 and other applicable law.

B. BID OPENING. On \_\_\_\_\_, City representatives opened the bids for the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004 and read the bids aloud.

C. PROJECT AWARD. On \_\_\_\_\_, the City Council awarded the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004 to the Contractor and directed City staff to send the Contractor written notice of award of the project. The City Council conditioned award of the project on the Contractor's providing executed copies of all documents specified in the Contract check list included in the bid package within ten (10) calendar days of receiving written notice concerning award of the project.

D. REQUIRED DOCUMENTS. The Contractor has provided the City executed copies of all documents specified in the Contract checklist included in the bid package within ten (10) calendar days of receiving written notice of award.

## CONTRACT TERMS

The City and the Contractor agree as follows:

1. THE WORK. The Contractor must furnish all equipment, tools, apparatus, facilities, material, labor, and skill necessary to perform and complete in a good and workmanlike manner the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004 ("Work") as shown in the Technical Specifications and Project Plans in accordance with the Contract Documents and applicable law.
2. LOCATION OF WORK. The Work will be performed at the following location:  
Healdsburg, California

3. TIME FOR COMPLETION. The Contractor must complete the Work in accordance with the Contract Documents within (working time) **412 calendar days** from the date specified in the City's Notice to Proceed ("Time for Completion").
  
4. REMEDIES FOR FAILURE TO TIMELY COMPLETE THE WORK. If the Contractor fails to fully perform the Work in accordance with the Contract Documents by the Time for Completion, as such time may be amended by change order or other modification to this Contract in accordance with its terms, and/or if the Contractor fails, by the Time for Completion, to fully perform all of the Contractor's obligations under this Contract that have accrued by the Time for Completion, the Contractor will become liable to the City for all resulting loss and damage in accordance with the Contract Documents and applicable law. The City's remedies for the Contractor's failure to perform include, but are not limited to, assessment of **liquidated damages of \$2,500 per day** in accordance with California Government Code Section 53069.85 and the Contract Documents, and/or obtaining or providing for substitute performance in accordance with the Contract Documents.
  
5. CONTRACT PRICE AND PAYMENT. As full compensation in consideration of completion of the Work in accordance with the Contract Documents and in consideration of the fulfillment of all of the Contractor's obligations under the Contract Documents, the City will pay the Contractor in lawful money of the United States the total price of \$\_\_\_\_\_ (the "Contract Price") as specified in the Contractor's completed Bid Schedule dated \_\_\_\_\_, \_\_\_\_\_, attached to and incorporated in this Contract. Payment to the Contractor under this Contract will be for Work actually performed in accordance with the Contract Documents and will be made in accordance with the requirements of the Contract Documents and applicable law. The City will have no obligation to pay the Contractor any amount in excess of the Contract Price unless this Contract is first modified in accordance with its terms. The City's obligation to pay the Contractor under this Contract is subject to and may be offset by charges that may apply to the Contractor under this Contract. Such charges include but are not limited to, charges for liquidated damages and/or substitute performance in accordance with the Contract Documents.
  
6. PREVAILING WAGES. In accordance with California Labor Code Section 1771, not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is to be performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed as provided in the California Labor Code must be paid to all workers engaged in performing the Work. In accordance with California Labor Code Section 1770 and following, the Director of Industrial Relations has determined the general prevailing wage per diem rates for the locality in which the Work is to be performed. In accordance with California Labor Code Section 1773, the City has obtained the general prevailing rate of per diem wages and the general rate for holiday and overtime work in the locality in which the Work is to be performed for each craft, classification or type of worker needed to perform the project. In accordance with California Labor Code Section 1773.2, copies of the prevailing rate of per diem wages are on file at the City Public Works Department and will be made available on request. Throughout the performance of the Work the Contractor must comply with all provisions of the Contract Documents and all applicable laws and regulations that apply to wages earned in performance of the Work.

7. THE CONTRACT DOCUMENTS. This Contract consists of the following documents (“Contract Documents”), all of which are incorporated into and made a part of this Contract as if set forth in full. In the event of a conflict between or among the Contract Documents, precedence will be in the following order:
- 7.1 Part 1 of the Contract and change orders and other amendments to this agreement signed by authorized representatives of the City and the Contractor.
  - 7.2 The General Provisions, Part 2 of the Contract, and change orders and other amendments to the General Conditions signed by authorized representatives of the City and the Contractor.
  - 7.3 The Special Provisions, if included make up Part 3 of the Contract, and include any addenda to the Special Provisions signed by authorized representatives of the City and issued prior to bid opening, Equal Product Proposals accepted by the City and signed by authorized City representatives prior to bid opening, and change orders and other amendments to the Technical Specifications signed by authorized representatives of the City and the Contractor.
  - 7.4 The Project Plans, Part 4 of the Contract, addenda to the Project Plans signed by authorized representatives of the City and issued prior to bid opening, Equal Product Proposals accepted by the City and signed by authorized City representatives prior to bid opening, and change orders and other amendments to the Project Plans signed by authorized representatives of the City and the Contractor.
  - 7.5 Notice Inviting Bids.
  - 7.6 Instructions to Bidders.
  - 7.7 The successful bidder’s completed Proposal Form and Bidder’s Sheet.
  - 7.8 The successful bidder’s completed Contractor License Information.
  - 7.9 The successful bidder’s completed List of Proposed Subcontractors.
  - 7.10 The successful bidder’s Workers Compensation Insurance Certification.
  - 7.11 The successful bidder’s completed Non-collusion Affidavit.
  - 7.12 The successful bidder’s Debarment Certification.
  - 7.13 The successful bidder’s signed Acknowledgment of Indemnity and Insurance requirements and completed Certificates of Insurance, Declaration page(s) and Endorsements.
  - 7.14 The successful bidder’s executed Performance Bond.
  - 7.15 The successful bidder’s executed Payment Bond.
  - 7.16 The Maintenance Bond form included in the bid package that the Contractor must execute prior to release of final payment under the Contract.

- 7.17 The successful bidder's Qualification Statement, if any.
- 7.18 The successful bidder's signed Signature Form.
8. PROVISIONS INCORPORATED BY REFERENCE. Provisions or parts of provisions that are incorporated by reference and not set forth at length in any of the Contract Documents will only form a part of this Contract to the extent the Contract Documents expressly make such provisions or parts of provisions a part of this Contract. For example, published public works agreement provisions, such as those of the State of California Department of Transportation Standard Specifications (known as the Standard Specifications) are only a part of this Contract to the extent expressly incorporated in this Contract by section number. When such published provisions are made a part of this Contract, references in the published provisions to other entities, such as the State, the Agency, or similar references, will be deemed references to the City as the context of this Contract may require.
9. INTERPRETATION OF CONTRACT DOCUMENTS. Any question concerning the intent or meaning of any provision of the Contract Documents, including, but not limited to, the Technical Specifications or Project Plans, must be submitted to the Public Works Director, or his/her designee, for issuance of an interpretation and/or decision by the authorized Public Works Director in accordance with the requirements of the Contract Documents. Interpretations or decisions by any other person concerning the Contract Documents will not be binding on the City. The decision of the Public Works Director, or his/her designee, will be final.
10. ASSIGNMENT PROHIBITED. The Contractor may not assign part or all of this Contract, or any moneys due or to become under this Contract, or any other right or interest of the Contractor under this Contract, or delegate any obligation or duty of the Contractor under this Contract without the prior written approval of an official authorized to bind the City and an authorized representative of Contractor's surety or sureties. Any such purported assignment or delegation without such written approval on behalf of the City and the Contractor's sureties will be void and a material breach of this Contract subject to all available remedies under this Contract and at law and equity.
11. CERTIFICATION RE CONTRACTOR'S LICENSE. By signing this Contract the Contractor certifies that the Contractor holds a valid license issued by the California State Contractors Licensing Board as required to perform the Work and as specified in the Notice to Bidders for the Project, and that the Contractor understands that failure to maintain its license in good standing throughout the performance of the Work may result in discipline and/or other penalties pursuant to the California Business and Professions Code, and may constitute a material breach of this Contract subject to all available remedies under this Contract and at law and equity.
12. SEVERABILITY. If any term or provision or portion of a term or provision of this Contract is declared invalid or unenforceable by any court of lawful jurisdiction, then the remaining terms and provisions or portions of terms or provisions will not be affected thereby and will remain in full force and effect.

**CONTRACTOR**

**CITY**

\_\_\_\_\_

City of Healdsburg  
\_\_\_\_\_

By: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Jeffrey Kay,  
City Manager

Executed by Contractor on \_\_\_\_\_

Executed by City on: \_\_\_\_\_

[Attach Notary Page]

By: \_\_\_\_\_  
Katie Edgar, Finance Director

**Attest:**

By: \_\_\_\_\_  
Raina Allan, City Clerk

The forgoing contract is approved by me in its entirety as to form on \_\_\_\_\_,  
2024.

\_\_\_\_\_  
City Attorney  
City of Healdsburg

## PERFORMANCE BOND

*(NOTE: The successful bidder must use this form. Use of any other bond form may prevent a contract from forming and/or result in forfeiture of the successful bidder's bid bond)*

### **KNOW ALL MEN BY THESE PRESENTS:**

WHEREAS the City Council of the City of Healdsburg has awarded to \_\_\_\_\_, (designated as the "PRINCIPAL") a contract for the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004, which contract and all of the contract documents as defined therein (designated as the "Contract") are hereby made a part hereof; and

WHEREAS, said PRINCIPAL is required under the terms of the Contract to furnish a bond for the faithful performance of the Contract;

NOW, THEREFORE, WE, the PRINCIPAL and \_\_\_\_\_ as surety (designated as "SURETY"), an admitted surety insurer authorized to do business in the State of California, are held and firmly bound unto the City (designated as "OBLIGEE"), in the penal sum of \_\_\_\_\_ dollars (\$ \_\_\_\_\_), lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, and administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that, if the above bound PRINCIPAL, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract and any alteration thereof made as therein provided, on his or their part to be kept and performed at the time and in the manner therein specified and in all respects according to their true intent and meaning, and shall defend, indemnify and save harmless the OBLIGEE, it's officials, officers, employees, volunteers and agents, as therein stipulated, then this obligation shall become null and void, otherwise it shall be and remain in full force and virtue.

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 or to the specifications or the plans accompanying the same or to any other part of the contract documents, as defined therein, shall in any way affect said SURETY's obligation on this bond, and the SURETY does hereby waive notice of any such change, extension of time, alteration or addition.

And the said SURETY, for value received, hereby stipulates and agrees that upon termination of the Contract for cause, the OBLIGEE reserves the right to refuse tender of the PRINCIPAL by the SURETY to complete the Contract work.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, the name and corporate seals of each corporate party being hereto affixed and these presents duly signed by their undersigned representatives, pursuant to authority of their governing bodies.

(Corporate Seal)

PRINCIPAL\_\_\_\_\_

By\_\_\_\_\_

(Acknowledgement)

Title\_\_\_\_\_

SURETY\_\_\_\_\_

(Corporate Seal)

By\_\_\_\_\_

(Attorney-in-fact)

(Acknowledgement)

Title\_\_\_\_\_

*(NOTE TO SURETY COMPANY: A certified copy of unrevoked resolution of authority for the attorney-in-fact must be submitted with and attached to the executed bond.)*

## PAYMENT/LABOR AND MATERIALS BOND

*(NOTE: The successful bidder must use this form. Use of any other bond form may prevent a contract from forming and/or result in forfeiture of the successful bidder's bid bond)*

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS the City Council of the City of Healdsburg has awarded to \_\_\_\_\_, (designated as the "PRINCIPAL") a contract for the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004, which contract and all of the contract documents as defined therein (designated as the "Contract") are hereby made a part hereof; and

WHEREAS, pursuant to California Civil Code Section 9550, the PRINCIPAL is required, before entering upon the performance of the Contract, to file a payment bond with and have such bond approved by the officer or public entity by whom the Contract is awarded; and

WHEREAS, pursuant to California Civil Code Section 9554, such payment bond must be in a sum not less than one hundred percent (100%) of the total amount payable by the terms of the Contract, and must satisfy the other requirements specified in that section; and

WHEREAS, the PRINCIPAL is required in accordance with the Contract to furnish a payment bond in connection with the Contract to secure payment of claims of laborers, mechanics and materialmen employed on work under the Contract in accordance with applicable law;

NOW, THEREFORE, THESE PRESENTS WITNESSETH:

That the PRINCIPAL and the undersigned \_\_\_\_\_, as surety (designated as "SURETY"), an admitted surety insurer authorized to do business in the State of California are held and firmly bound unto all laborers, material men, and all other persons named in California Civil Code Section 9100 (a) in the sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_), lawful money of the United States, being a sum not less than one hundred percent of the total amount payable by the terms of the Contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the PRINCIPAL or any of the PRINCIPAL's subcontractors, or the heirs, executors, administrators, successors, or assigns of any, all, or either of them, shall fail to pay any persons named in California Civil Code Section 9100 (a), or fail to pay for any labor, materials, provisions, provender, or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or fail to pay amounts due under the Unemployment Insurance Code with respect to such work or labor, or fail to pay for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the PRINCIPAL or any subcontractors of the PRINCIPAL pursuant to Section 13020 of the Unemployment Insurance Code with respect to such work or labor, that the SURETY will pay for the same in an amount not exceeding the amount herein above set forth, and also, in case suit is brought upon this bond, will pay a reasonable attorney's fee to be awarded and fixed by the Court; otherwise this obligation shall be void.

It is hereby expressly stipulated and agreed by the said Surety, for value received, that this bond shall inure to the benefit of any and all of the persons named in Section 9100 (a) of the California Civil Code so as to give a right of action to them or their assigns in any suit brought upon this bond.

It is hereby further expressly stipulated and agreed by the said Surety, for value received, that no change, extension of time, alteration or addition to the terms of the Contract or the specifications or drawings accompanying the same or to any other part of the contract documents, as defined therein, shall in any manner affect the obligations of the SURETY on this bond, and SURETY does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, the name and corporate seals of each corporate party being hereto affixed and these presents duly signed by their undersigned representatives, pursuant to authority of their governing bodies.

(Corporate Seal)

PRINCIPAL\_\_\_\_\_

By\_\_\_\_\_

(Acknowledgement)

Title\_\_\_\_\_

SURETY\_\_\_\_\_

(Corporate Seal)

By\_\_\_\_\_  
(Attorney-in-fact)

(Acknowledgement)

Title\_\_\_\_\_

*(NOTE TO SURETY COMPANY: A certified copy of unrevoked resolution of authority for the attorney-in-fact must be submitted with and attached to the executed bond.)*

## MAINTENANCE BOND

*(NOTE: The Contractor must use this form. Use of any other bond form may prevent release of final payment and/or release of retention under the Contract)*

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS the City Council of the City of Healdsburg has awarded to \_\_\_\_\_, (designated as the "PRINCIPAL") a contract for the CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004, which contract and all of the contract documents as defined therein (designated as the "Contract") are hereby made a part hereof; and

WHEREAS, the PRINCIPAL is required under the terms of the Contract to furnish a bond for the correction of any defects due to defective materials or workmanship in the work performed under the Contract.

NOW, THEREFORE, we the PRINCIPAL and the undersigned \_\_\_\_\_, as surety (designated as "SURETY"), an admitted surety insurer authorized to do business in the State of California, are held and firmly bound unto the City of Healdsburg, (designated as the "OBLIGEE"), in the penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_), lawful money of the United States, being a sum not less than ten percent (10%) of the final Contract price, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if, during a maintenance period of one (1) year from the date of acceptance by the OBLIGEE of the contracted work, the PRINCIPAL upon receiving written notice of a need for repairs which are directly attributable to defective materials or workmanship, shall diligently take the necessary steps to correct said defects within seven (7) days from the date of said notice, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

If any action shall be brought by the OBLIGEE upon this bond, a reasonable attorney's fee, to be fixed by the Court, shall be and become a part of OBLIGEE's judgment in any such action. No right of action shall accrue on this bond to, or for the use of, any person or corporation other than the OBLIGEE named herein or the heirs, executors, administrator or successor of the OBLIGEE.

IN WITNESS WHEREOF, the above bound parties have executed this instrument under their seals this \_\_\_\_\_ day of \_\_\_\_\_, the name and corporate seals of each corporate

party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(Corporate Seal)

PRINCIPAL \_\_\_\_\_

By \_\_\_\_\_

(Acknowledgment)

Title \_\_\_\_\_

SURETY \_\_\_\_\_

(Corporate Seal)

By \_\_\_\_\_  
(Attorneys-in-fact)

(Acknowledgment)

Title \_\_\_\_\_

*(NOTE TO SURETY COMPANY: A certified copy of unrevoked resolution of authority for the attorney-in-fact must be submitted with and attached to the executed bond.)*

# ESCROW AGREEMENT

## SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agreement is made and entered into by and between the City of Healdsburg, whose address is 401 Grove Street, Healdsburg, California 95448, hereinafter called "City", \_\_\_\_\_, whose address is \_\_\_\_\_, hereinafter called "Contractor", and \_\_\_\_\_, whose address is \_\_\_\_\_, hereinafter called "Escrow Agent"

For consideration hereinafter set forth, the City, Contractor, and Escrow Agent agree as follows:

1. Pursuant to Section 22300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by City pursuant to the Construction Contract entered into between the City and Contractor for the project entitled (CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004 in the amount of \_\_\_\_\_ dated \_\_\_\_\_ (hereinafter referred to as the "Contract"). Alternatively, on written request of the Contractor, the City shall make payments of the retention earnings directly to the Escrow Agent. When Contractor deposits the securities as substitute for Contract earnings, the Escrow Agent shall notify the City within 10 days of the deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between the City and Contractor. Securities shall be held in the name of City of Healdsburg and shall designate the Contractor as the beneficial owner.
2. The City shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent holds securities in the form and amount specified above.
3. When the City makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until such time as the escrow created under this contract is terminated. The Contractor may direct the investments of the payments into securities. All terms and conditions of this agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the City pays the escrow agent directly.
4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account and all expenses of the City. These expenses and payment terms shall be determined by the City, Contractor and Escrow Agent.
5. The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of the Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the City.
6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from City to the Escrow Agent that City consents to the withdrawal of the amount sought to be withdrawn by Contractor.
7. The City shall have a right to draw upon the securities in the event of default by the Contractor. Upon seven day's written notice to the Escrow Agent from the City of the default, the Escrow

Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the City.

8. Upon receipt of written notification from the City certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payments of fees and charges.

9. Escrow Agent shall rely on the written notifications from the City and the Contractor pursuant to Sections (5) to (8) inclusive, of this agreement and the City and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.

10. The names of the persons who are authorized to give written notice or to receive written notice on behalf of the City and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures, are as follows:

**On Behalf of City:**

\_\_\_\_\_  
\_\_\_\_\_  
Title

\_\_\_\_\_  
\_\_\_\_\_  
Name

**On Behalf of Contractor**

\_\_\_\_\_  
\_\_\_\_\_  
Title

\_\_\_\_\_  
\_\_\_\_\_  
Name

**On Behalf of Escrow Agent:**

\_\_\_\_\_  
\_\_\_\_\_  
Title

\_\_\_\_\_  
\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Address

At the time the Escrow Account is opened, the City and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

City:

\_\_\_\_\_

Contractor:

\_\_\_\_\_

Title

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Name

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Signature

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Address

Title

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Name

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Signature

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Address

# CONTRACT PART 2

## GENERAL PROVISIONS

### SECTION 1 Definitions

The following terms as used in any agreement of which these General Provisions are a part are defined as follows:

- 1-1.01 Contract:** The agreement between the City and Contractor concerning the Project, as evidenced by and comprised of the Contract Documents.
- 1-1.02 Architect:** The person or persons so specified on the Technical Specifications and/or Project Plans.
- 1-1.03 ASTM:** American Society for Testing and Materials latest edition.
- 1-1.04 Bid Package:** All of the documents listed as comprising the entire Bid Package as specified in the Instructions to Bidders and representing the full set of documents made available to bidders on the Project.
- 1-1.05 City:** City of Healdsburg
- 1-1.06 Public Works Standard Specifications and Details:** The edition of the City of Healdsburg Public Works Standard Specifications and Details in effect on the date of the last signature to this Contract.
- 1-1.07 Contract Documents:** All those documents listed in Paragraph 7 of the Contract Part 1 as comprising the entire agreement between the City and the Contractor.
- 1-1.08 Contractor:** The successful bidder for the Project and party to the Contract with the City as specified in the Contract Documents.
- 1-1.09 Days:** Unless otherwise specified in the Contract Documents, days mean calendar days.
- 1-1.10 Engineer:** The City's authorized representative for administration and overall management of the Project, Contract, and Work. The Engineer is the official point of contact between the City and the Contractor.
- 1-1.11 Project:** The CIP-01-024 MUNICIPAL RECYCLED WATER PIPELINE PROJECT, PROJECT WA004 project as described in the Technical Specifications and Project Plans.
- 1-1.12 Project Plans:** The primarily graphic detailed requirements concerning the Project contained in the Bid Package and any addenda to the Project Plans signed by authorized City representatives and issued prior to bid opening, Equal Product Proposals accepted by the City and signed by authorized City representatives prior to bid opening, and change orders and other amendments to the Project Plans signed by authorized representatives of the City and the Contractor in accordance with the requirements of the Contract Documents.

- 1-1.13 Project Inspector:** The party or parties charged by the City with inspecting the Work for compliance with the requirements of the Contract Documents and applicable laws and regulations. The Project Inspector acts under the direction of the City and must coordinate with the Engineer as directed by the City in accordance with the Contract Documents.
- 1-1.14 Caltrans Standard Specifications:** The State of California Department of Transportation Standard Specifications for Construction of Local Streets and Roads, May 2006 edition.
- 1-1.15 Caltrans Construction Manual:** The State of California Department of Transportation Construction Manual, August 2006 edition.
- 1-1.16 Subcontractor:** A person, firm or corporation that is obligated as a party to a contract with the Contractor to perform part of the Work. For purposes of these General Provisions Subcontractors include, but are not limited to, those that are obligated as parties to a contract with the Contractor to specially fabricate and install a portion of the Work according to the Technical Specifications and/or Project Plans.
- 1-1.17 Technical Specifications:** The detailed Project requirements contained in the Bid Package and any addenda to the Technical Specifications signed by authorized City representatives and issued prior to bid opening, Equal Product Proposals accepted by the City and signed by authorized City representatives prior to bid opening, and change orders and other amendments to the Technical Specifications signed by authorized representatives of the City and the Contractor in accordance with the requirements of the Contract Documents.
- 1-1.18 Work:** The furnishing of all equipment, tools, apparatus, facilities, material, labor and skill necessary to perform and complete in a good and workmanlike manner the Project as shown in the Technical Specifications and Project Plans in accordance with the Contract Documents and applicable law.
- 1-1.19 Written Notice:** Will be deemed to have been duly served for purposes of these General Provisions and any Contract of which they are a part if delivered in person to the individual or to a member of the firm or to any office of the corporation for whom the notice is intended, or if sent by registered or certified mail to the last known business address known to the party giving notice. Unless otherwise specified in the Contract Documents, the last known address of the Contractor will be that listed in the Contractor's completed Proposal.

## **SECTION 2 Scope of Work**

**2-1.01 Documents Furnished by City.** The City will furnish to the Contractor, free of charge, five (5) sets of prints of the Project Plans and Technical Specifications for execution of the Work. Throughout the performance of the Work the Contractor must keep one copy of the Project Plans and Technical Specifications in good order and available for review by the Engineer, the Architect, and any other City contractors or representatives.

**2-1.02 Ownership of Documents Furnished by City.** All documents furnished by the City, including, but not limited to, the Technical Specifications, Project Plans, and any copies, are the property of the City. Documents furnished by the City may not be used on any other work. All documents furnished by the City must be returned to City upon completion of the Work.

### **2-1.03 Technical Specifications and Project Plans.**

- a. The Technical Specifications and Project Plans are complementary and intended to mutually describe the Work necessary to complete the Project in accordance with the Contract Documents.
- b. In general, the Project Plans indicate dimensions, position and kind of construction, and the Technical Specifications indicate qualities and methods. Any Work indicated on the Project Plans and not mentioned in the Technical Specifications or vice versa must be furnished as though fully set forth in both. Work that is not particularly detailed, marked or specified will be the same as similar Work that is detailed, marked or specified. The Contractor must furnish items necessary for the operation of equipment depicted in the Project Plans or specified in the Technical Specifications that are suitable to allow such equipment to function properly at no extra charge.
- c. The Contractor must notify the Engineer as soon as possible of any apparent errors or inconsistencies, including, but not limited to, typographical or notational errors in the Project Plans, Technical Specifications, and/or in work done by others affecting the Work. The Engineer will issue instructions concerning any such apparent errors or inconsistencies. If the Contractor proceeds with Work impacted by apparent errors or inconsistencies without instructions from the Engineer, the Contractor does so at its sole risk and will have all of the obligations and the City will have all of the rights and remedies specified in Section 11 concerning any resulting damage or defect.
- d. The General Provisions apply with equal force to all of the Work, including extra work authorized by the Engineer in accordance with the Contract Documents. The Contractor must submit any required shop diagrams and/or drawings by the times and in the quantities indicated in the Technical Specifications. Any such shop diagrams and/or drawings must show completely the Work to be done, expanding on the Project Plans concerning details not previously shown, field conditions and the condition of the Work. Engineer review of such shop diagrams and/or drawings will concern conformance with the requirements of the Contract Documents only. The Engineer assumes no responsibility for the correctness or accuracy of the dimensions or any other contents of any shop diagrams and/or drawings submitted by the Contractor. The Contractor must check all dimensions at the Work site. Shop diagrams and/or drawings must be clearly marked with the name of the Project and the name of the Contractor, subcontractor or supplier making the submittal, and must be stamped and signed by the Contractor and submitted under a signed transmittal letter from the

Contractor certifying that all dimensions have been checked at the Work site. These requirements are mandatory. The Engineer will not review shop diagrams and/or drawings that do not satisfy these requirements. The Contractor will be responsible for any and all discrepancies between dimensions of the actual Work site and/or Work and those shown on shop diagram and/or drawings submitted by the Contractor, and for any other errors contained in or resulting from such shop diagrams and/or drawings, including, but not limited to, errors in material and/or equipment quantities and any resulting errors, delays or additional cost in the performance of the Work. The Contractor will have all of the obligations and the City will have all of the rights and remedies that are specified in Section 11 concerning any discrepancies or errors in shop diagrams and/or drawings submitted by the Contractor, and concerning any resulting errors, delays or additional costs in the performance of the Work.

## **SECTION 3 Control of Work and Material**

**3-1.01 Engineer's Status.** The Engineer will administer the Project in accordance with the Contract Documents. After execution of the Contract and issuance of the Notice to Proceed, all correspondence and/or instructions concerning the Project between the Contractor and/or City must be forwarded through the Engineer. Except as otherwise provided in the Contract Documents, the Engineer will not be responsible for and will not have control or charge of construction means, methods, techniques, or procedures or for safety precautions in connection with the Work. The Engineer, however, will have authority to reject materials and/or workmanship that do not conform to the requirements of the Contract Documents. The Engineer will also have the authority to require inspection or testing of the Work.

**3-1.02 Architect's Status.** The Architect will advise the Engineer concerning decisions on all claims of the Contractor and all other matters relating to the execution and progress of the Work or the interpretation of the Contract Documents. The Architect will also advise the Engineer concerning Work that does not conform to the Contract Documents. Whenever, in the Architect's opinion, it is necessary or advisable in accordance with the Contract Documents, the Architect may recommend to the Engineer inspection or testing of the Work, whether or not such Work is then fabricated, installed or completed.

### **3-1.03 Inspection and Testing of Work and Material.**

- a. The City, the Engineer, the Architect and their representatives will have access to the Work at all times wherever it is in preparation or progress. The Contractor must provide proper facilities for such access and for inspection.
- b. The Contractor must inspect all materials as delivered and promptly return all defective materials without waiting for their rejection by the Architect or Engineer.
- c. If the Engineer, the Technical Specifications, or any laws, ordinances, or any public authority require any Work to be tested or approved, the Contractor must give the Engineer timely notice of the Contractor's readiness for inspection. Inspections will be promptly made, and where practicable, at the source of supply. Any Work subject to such testing that is covered up without timely notice to the Engineer or without the approval or consent of the Engineer must, if required by the Engineer, be uncovered for examination at the Contractor's expense. The Contractor will have all of the obligations and the City will have all of the rights and remedies that are specified in Section 11 concerning any Work subject to testing that is covered up or otherwise rendered inaccessible for inspection without timely notice to the Engineer and that is not uncovered for examination at the Contractor's expense if required by the Engineer.
- d. Tests of materials or qualification tests required by the Contract Documents must be made in accordance with the Technical Specifications and the requirements of the California Building Standards Code as adopted by the City and other applicable law. Copies of all testing reports will be distributed as required in the Technical Specifications.
- e. The City or its representatives may order re-examination of questioned Work. If ordered to do so, the Contractor must uncover such Work. If such Work is found to be according to the Contract Documents, the City will pay the cost of uncovering and

restoring the Work, unless such Work was subject to testing and covered up without timely notice to or approval of the Engineer. If re-examined Work is found not in accordance with the Contract Documents, the Contractor must pay the cost of uncovering and restoring the Work. The Contractor will have all of the obligations and the City will have all of the rights and remedies that are specified in Section 11 concerning any re-examined Work not in accordance with the Contract Documents that the Contractor fails to uncover and restore at the Contractor's expense.

- f. The Contractor must replace or correct without charge any material or workmanship found not to conform to the requirements of the Contract Documents, unless the City consents to accept such material or workmanship with an appropriate adjustment in the Contract Price. The Contractor must promptly segregate and remove non-conforming material from the Work site. The Contractor will have all of the obligations and the City will have all of the rights and remedies that are specified in Section 11 concerning any failure by the Contractor to replace or correct without charge any material or workmanship that does not conform to the requirements of the Contract Documents and that the City has not consented to accept.

**3-1.04 Samples Furnished by the Contractor.** The Contractor must furnish all samples for approval as directed in sufficient time to permit the Architect or Engineer to examine, approve and select samples before they are required by the progress of the Work. Portions of the Work for which samples are required and for which the Architect or Engineer has selected samples must be in accordance with such approved samples. Samples must be sent prepaid to the office of the Engineer or to such place as the Engineer may direct.

**3-1.05 Materials and Substitutions.**

- a. Materials used for the Work must be new and of the quality specified. When not particularly specified, materials must be the best of their class or kind. The Contractor must, if required, submit satisfactory evidence as to the kind and quality of materials.
- b. If the Contractor submitted complete information to the Public Works Department for products proposed as equals in accordance with the bid package, and the City approved such products proposed as equals in writing, the Contractor may either furnish such products approved as equals, or furnish the products listed by manufacturer name, brand or model number in the Technical Specifications or Project Plans. The City retains the right, in its sole discretion, to accept or reject any other proposed substitution. To be considered, proposals concerning products proposed as equals must include sufficient information to permit the City to determine whether the products proposed as equals will satisfy the same performance requirements as products listed by manufacturer's name, brand or model number. Such performance requirements may include, but are not limited to, size, strength, function, and appearance, ease of maintenance and repair, and useful life requirements. If the City does not accept a proposed substitution, the Contractor must furnish the product specified in the Technical Specifications or Project Plans for the Contract Price, regardless of whether the product is specified by manufacturer's name, brand or model number, or otherwise.
- c. During the performance of the Work, all materials must be neatly stacked, properly protected from the weather and other adverse impacts, and placed so as to avoid interference with efficient progress of the Work, with other activities of the City, or with the use of existing City facilities by the public. Materials may not be stored in a manner

that presents a safety hazard or a nuisance. All materials must be delivered so as to ensure efficient and uninterrupted progress of the Work. Materials must be stored so as to cause no obstruction and so as to prevent overloading of any portion of the Work. The Contractor will be responsible for damage or loss of materials delivered to and/or stored at the Work site due to weather or other causes. The Contractor must promptly remove from the Work site all materials rejected by the City or its representatives as failing to conform to the requirements of the Contract Documents, whether such non-conforming materials have been incorporated in the Work or not. If the City or its representatives so direct, the Contractor must promptly replace and re-execute Work performed by the Contractor and order the replacement and re-execution of Work performed by subcontractors using non-conforming materials with materials that satisfy the requirements of the Contract Documents without expense to the City. The Contractor will bear the expense of making good all Work destroyed or damaged by such removal. The Contractor will have all of the obligations and the City will have all of the rights and remedies that are specified in Section 11 concerning any failure by the Contractor to replace or re-execute Work using non-conforming materials, and/or to make good all Work destroyed or damaged by such removal and/or execution.

- d. If any portion of the Work done or material furnished under this Contract proves defective and not in accordance with the Project Plans or Technical Specifications, and if the Engineer determines that the imperfection of the same is not of sufficient magnitude or importance to make the Work dangerous or undesirable, or if the removal of such Work, is impractical or will create conditions which are dangerous or undesirable, the Engineer may retain such Work, instead of requiring the imperfect Work to be removed and reconstructed, and make such deductions therefore in the payments due or to become due the Contractor as are just and reasonable.

**3-1.06 Audit and Examination of Records.** The City may examine and audit at no additional cost to the City all books, estimates, records, contracts, documents, bid documents, bid cost data, subcontract job cost reports and other Project related data of the Contractor, subcontractors engaged in performance of the Work, and suppliers providing supplies, equipment and other materials required for the Work, including computations and projections related to bidding, negotiating, pricing or performing the Work or Contract modifications and other materials concerning the Work, including, but not limited to, Contractor daily logs, in order to evaluate the accuracy, completeness, and currency of cost, pricing, scheduling and any other Project related data. The Contractor will make available all such Project related data at all reasonable times for examination, audit, or reproduction at the Contractor's business office at or near the Work site, and at any other location where such Project related data may be kept until three years after final payment under the Contract. Pursuant to California Government Code Section 8546.7, if the amount of public funds to be expended is in excess of \$10,000, this Contract will be subject to the examination and audit of the State Auditor, at the request of the City, or as part of any audit of the City, for a period of three (3) years after final payment under the Contract.

**3-1.07 Advertising.** No advertising signs of any kind may be displayed on the Work site, or on fences, offices or elsewhere adjacent to the Work site.

**3-1.08 Project Schedule.** Within ten (10) days after execution and delivery of the Contract, and prior to the issuance of the notice to proceed, the Contractor must deliver to the Engineer a bar chart and critical path (CPM) schedule detailing the Contractor's intended schedule of Work for the entire Project. The schedules must be detailed to clearly show the relative sequence of the items of Work, their inter-relationships, start and completion dates, float,

the critical path, and any other item deemed necessary by the Engineer. The schedule must allow for the completion of the entire Work within the Time for Completion.

- a. City Review of Schedule. The City may review the Contractor's submitted schedule and may note any exceptions. The Contractor must correct any exceptions noted by the City within five (5) working days of being notified of the exceptions.
- b. Update of Schedule. After submission of a schedule to which the City has taken no exceptions, the Contractor must submit an updated schedule on a monthly basis or as otherwise specified by the City until completion of the Work. The updated schedule must show the progress of Work as of the date specified in the updated schedule.
- c. Float. The schedule must show early and late completion dates for each task. The number of days between these dates will be designated as "Float". The Float will be designated to the Project and will be available to both the City and the Contractor as needed to complete the Work in accordance with the Contract.
- d. Failure to Submit Schedule. If the Contractor fails to submit schedules within the time periods specified in this Section, or submits a schedule to which the City has taken uncorrected exceptions, the City may withhold payments to the Contractor until such schedules are submitted and/or corrected in accordance with the Contract Documents.
- e. Responsibility for Schedule. The Contractor will be solely and exclusively responsible for creating the schedule and properly updating it. The City may note exceptions to any schedule submitted by the Contractor. However, the Contractor will be solely responsible for determining the proper method for addressing such exceptions and the City's review of the schedule will not create scheduling obligations of the City.

**3-1.09 Construction Staking.** All Work done under this Contract must be in conformance with the Project Plans and staked by the Engineer in the field. The Contractor must inform the Engineer, forty-eight (48) hours in advance, of the time and places at which he or she wishes to do work, in order that lines and grades may be furnished and necessary measurements for record and payment made, with the minimum of inconvenience to the Engineer and delay to the Contractor.

The City will provide construction staking services to establish horizontal and vertical control benchmarks. Contractor shall provide construction staking based on these benchmarks. The Contractor shall carefully preserve bench marks, reference points, and stakes and in the case of willful or careless destruction, will be responsible for the cost of replacement and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance

**3-1.10 Materials Testing.** Materials will be tested by the City of Healdsburg or its authorized agent, following the Caltrans Standard Specifications. Statistical testing may not be used. All individual samples must meet the specified test results. Each material used must meet the specified requirements.

The Contractor must request and coordinate all testing. All tests must occur in the presence of the Project Inspector. The City will, at its sole discretion, have the right to reject any and/or all test results, that do not meet this requirement, and to order a retest

in the presence of the Project Inspector. The costs for all retests so ordered will be the responsibility of the Contractor. The cost of all retests will be charged to the Contractor at the actual cost plus 30 percent, with a minimum charge of \$150.00 per test to cover staff and administrative costs.

The Contractor, at its sole expense, will provide all material and compaction tests. Sampling and testing will comply with Chapter 3 of the Caltrans Construction Manual at a minimum. Where conditions vary, the City may perform additional testing. Cost for testing of materials offered in lieu of the specified materials will be the responsibility of the Contractor. Cost for R-value tests when required by the Caltrans Standard Specifications will be the responsibility of the Contractor.

Testing will only be performed on normal City working days between the hours of 8:00 a.m. and 4:00 p.m. Monday through Thursday unless other arrangements are made in advance. Tests performed outside of these hours may be subject to increased charges.

The Contractor must request all tests in writing a minimum of 2 working days in advance of the time desired. A minimum of one working day must be allowed for compilation and reporting of data and test results after tests have been performed. No subsequent layer of material may be placed until a passing test is obtained and acknowledged by the City.

Concrete and asphalt may be supplied only from suppliers approved and certified by the State Department of Transportation. Proposed mix designs for all concrete and asphalt concrete to be placed within the City of Healdsburg must be provided to and approved by the City, prior to placement.

The Contractor must coordinate with the City concerning any additional testing as required.

## SECTION 4 Changes in Work

**4-1.01 City Directed Change Orders.** The City may at any time during the progress of the Work direct any amendments to the Work or any of the Contract Documents, including, but not limited to the Technical Specifications, or Project Plans. Such amendments will in no way void the Contract, but will be applied to amend the Contract Price, if such amendments affect the Contract Price, the Project schedule, if such amendments affect the Project schedule, or any other provision of the Contract Documents based on a fair and reasonable valuation of the amendment in accordance with this Section 4.

**4-1.02 Writing Requirement.** Change orders and other amendments to the Technical Specifications, the Project Plans, or other Contract Documents may be made only upon prior written approval of the Engineer and as evidenced by a writing executed by authorized representatives of the City and the Contractor.

**4-1.03 Contractor Proposed Change Orders.** Unless the Engineer otherwise authorizes or the City and the Contractor otherwise agree, change order proposals submitted by the Contractor must be submitted to the Engineer no later than the time of the proposed change.

**4-1.04 All Change Orders.** All change order proposals must be submitted on completed City Change Order forms. All such change order proposals must itemize all cost impacts of the proposed change order and include a total price for that change order and the amended Contract Price that would become effective upon execution of the change order. All change order proposals must specify any change in the Project schedule, or in any Project milestone including, but not limited to, the Time for Completion, under the change order. It is understood that change orders that do not specify a change in any milestone, including, but not limited to, the Time for Completion, may be accomplished by the Time for Completion then in effect.

**4-1.05 Change Order Pricing.** Change order pricing for all change orders, whether, additive, deductive, or both, will be governed by the following:

- a. Prices specified in the Contract Documents will apply to cost impacts involving items for which the Contract Documents specify prices.
- b. Cost impacts involving items for which the Contract Documents do not specify prices may be paid on a lump sum basis as approved by the City.
- c. For cost impacts involving items for which the Contract Documents do not specify prices, and for which no lump sum amount has been approved by the City, charges or credits for the Work will be paid on a time and materials basis in accordance with the following and subject to Caltrans Standard Specifications, provision 9-1.03 concerning allowable direct charges. The time and materials payment will be the sum of and limited to the direct and indirect costs for labor, materials, equipment and overhead calculated as follows:
  6. Labor: The Contractor will be paid the cost of labor for the workers (including foremen when authorized by the Engineer), used in the actual and direct performance of the Work. The cost of labor utilized in performing the Work, whether the employer is the Contractor, a subcontractor or other entity engaged in the performance of the Work, will be the sum of the following:

- **Actual Wages:** The actual wages paid will include any employer fringe benefit payments to or on behalf of the workers for health and welfare, pension, vacation and similar purposes. The actual wages and fringe benefits paid must be at the rates shown on the certified payroll documents submitted by the Contractor.
  - **Labor Surcharge:** The labor surcharge will be as set forth in the latest edition of the California Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates". The labor surcharge will constitute full compensation for all payments imposed by State or Federal laws and for all other payments made to, or on behalf of, workers engaged in the performance of the Work, excluding the Actual Wages as defined above.
  - **Fixed Markup:** A fixed markup of 33% of the sum of the actual wages paid and the labor surcharge applicable to such actual wages, together with the actual wage and labor surcharge costs described in this provision will constitute full and complete compensation for all overhead, profit, incidentals, and any and all other direct or indirect expenses associated with furnishing all labor for the Work.
7. **Materials:** Materials costs will be the direct costs for materials actually exhausted, consumed or entering permanently into the Work, plus a fixed markup of 15% of such direct materials costs, which, together with the direct cost of materials as described in this provision will constitute full and complete compensation for all overhead, profit, incidentals, and any and all other direct or indirect expenses associated with furnishing all materials for the Work.
  8. **Equipment:** All equipment used will be paid in accordance with the rates in subsection 9-1.03A(3) entitled "Equipment Rental" of the Caltrans Standard Specifications, which subsection 9-1.03A(3) is made a part of this Contract, plus a fixed markup of 10% of such equipment rates, which, together with the equipment rates as described in this provision will constitute full and complete compensation for all overhead, profit, incidentals, and any and all other direct or indirect expenses associated with furnishing all equipment for the Work.
  9. Unless approved in writing in accordance with provision 4-1.02 of this Contract in advance of performance of the Work, any and all other cost impacts (including, but not limited to profit, bond premiums or fees, insurance premiums or fees, superintendent labor, clerical expenses, home office expenses, Work site office expenses, utility costs, permit costs, and licensing costs) involving items for which the Contract Documents do not specify prices, and for which no lump sum amount has been approved by the City, will constitute incidentals, full compensation for which will be deemed included in the markups for labor, material, and equipment specified above, and no additional compensation for such cost impacts will be allowed.

**4-1.06 Liability Under Unapproved Change Orders.** The Contractor will be solely responsible for any and all losses, costs, or liabilities of any kind incurred by the Contractor, any subcontractor engaged in the performance of the Work, any party supplying material or

equipment for the Work or any third party that are incurred pursuant to Contractor-proposed change orders prior to issuance of an approved change order executed in accordance with this Section 4. The Contractor will have all of the obligations and the City will have all of the rights and remedies that are specified in Section 11 concerning any work or resulting losses, costs, or liabilities pursuant to a Contractor proposed change order before issuance of an approved change order executed in accordance with this Section 4.

**4-1.07 Changes Subject to Contract Documents.** Any changes in the Work and/or the Contract Documents pursuant to change orders and any other amendments issued in accordance with the Contract Documents, including this Section 4, will in all respects be subject to all provisions of the Contract Documents, including, but not limited to, the Technical Specifications and the Project Plans, except as modified by such change orders or amendments.

**4-1.08 Change Order Disputes.**

- a. Disputed City-Directed Change Orders. If the Contractor disputes a City directed change order following a reasonable effort by the City and the Contractor to resolve the dispute including, at a minimum, a meeting between appropriate representatives of the Contractor and the City, the Contractor must commence performing the Work consistent with the disputed change order within five (5) working days of the last meeting between representatives of the Contractor and the City to resolve the dispute, or within the time specified in the disputed City directed change order, whichever is later. In performing Work consistent with a disputed City-directed change order pursuant to this provision the Contractor will have all of the Contractor's rights concerning claims pursuant to the Contract Documents and applicable law.
- b. Disputed Contractor Proposed Change Orders. If the City disputes a Contractor proposed change order, the City and the Contractor will use reasonable efforts to resolve the dispute including, at a minimum, holding a meeting between appropriate representatives of the Contractor and the City. Regardless of and throughout any such efforts to resolve the dispute the Contractor must continue performing the Work irrespective of and unmodified by the disputed change order. In continuing to perform the Work, the Contractor will retain all of the Contractor's rights under contract or law pertaining to resolution of disputes and protests between contracting parties. Disputes between the City and the Contractor concerning any Contractor-proposed change order or other amendment do not excuse the Contractor's obligation to perform the Work in accordance with the Contract Documents excluding such Contractor-proposed change order or other amendment by the Time for Completion or waive any other Project milestone or other requirement of the Contract Documents.

## SECTION 5 Trenching and Utilities

**5-1.01 Excavation More Than Four Feet Deep.** In accordance with California Public Contract Code Section 7104, if the Work involves excavation more than four feet deep the Contractor must promptly notify the City in writing before disturbing: any material that the Contractor believes may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II or Class III disposal site in accordance with provisions of existing law; any subsurface or latent physical conditions at the Work site differing from those indicated; or any unknown physical conditions at the Work 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 Documents. The City will promptly investigate any such conditions for which notice is given. If the City finds that the conditions do materially differ, or involve hazardous waste, and would cause a decrease or increase in the cost or time of performance of the Work, the City will issue a change order pursuant to Section 4 of these General Provisions. If a dispute arises between the City and the Contractor concerning whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the cost or time of performance, the Contractor will not be excused from any completion date provided in the Contract Documents, but will proceed with all Work to be performed. The Contractor will retain all rights under contract or law pertaining to resolution of disputes and protests between contracting parties.

**5-1.02 Excavation of Five Feet or More.** In accordance with California Labor Code Section 6705, contractors performing contracts exceeding \$25,000 in cost and involving excavation five or more feet deep must submit for the City's acceptance, prior to excavation, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during excavation. If the plan varies from the shoring system standards, it must be prepared by a registered civil or structural engineer.

### **5-1.03 Utility Relocation Costs.**

- a. In accordance with California Government Code Section 4215, the City assumes the responsibility for the timely removal, relocation or protection of existing main or trunk line utility facilities located on the Work site if such utilities are not identified by the City in the Technical Specifications and/or Project Plans. The City will compensate the Contractor for the costs of locating, repairing damage not due to the Contractor's failure to exercise reasonable care, and removing or relocating existing main or trunk line utility facilities located at the Work site and not identified with reasonable accuracy in the Technical Specifications and/or Project Plans. The City will also compensate the Contractor for the cost of equipment on the Project necessarily idled during such work. The Contractor will not be assessed liquidated damages for Work completion delays caused by the City's failure to provide for removal or relocation of such main or trunk line utility facilities.
- b. Nothing in this provision or the Contract Documents will be deemed to require the City to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Work site can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, cleanouts, on or adjacent to the Work site; provided, however, that nothing in this provision or the Contract Documents will relieve the City from identifying main or trunk lines in the Technical Specifications and/or Project Plans.

- c. Nothing in this provision or the Contract Documents will preclude the City from pursuing any appropriate remedy against the utility for delays, which are the responsibility of the utility.
- d. Nothing in this provision or the Contract Documents will be construed to relieve the utility from any obligation as required either by law or by contract to pay the cost of removal or relocation of existing utility facilities.
- e. If the Contractor while performing the Work discovers utility facilities not identified by the City in the Technical Specifications and/or Project Plans, the Contractor must immediately notify the City and utility in writing.
- f. Either the City or the utility, whichever owns existing main or trunk line utility facilities located on the Work site, will have sole discretion to effect repairs or relocation work or to permit the Contractor to perform such repairs or relocation work at a reasonable price.

#### **5-1.04 Protection of Existing Facilities and Property.**

The Contractor must notify Underground Service Alert (USA) for marking the locations of existing underground facilities.

Subject to Section 5 of the General Provisions, the Contractor must take all necessary measures to avoid injury to existing surface and underground utility facilities in and near the Work site. Subject to Section 5 of the General Provisions, no error or omission of utility markouts will be construed to relieve the Contractor from his responsibility to protect all underground pipes, conduits, cables or other structures affected by the work.

The existing underground facilities in the area of Work may include telephone, television and electrical cables, gas mains, water mains, sewer pipe and drainage pipe. The various utility companies must be notified before trenching begins and at such other times as required to protect their facilities. Subject to Section 5 of the General Provisions, all underground facilities must be located and exposed ahead of trenching to prevent damage to the facilities, and to determine the depth and character of all facilities that cross or infringe on the trench prism. The Contractor must immediately notify the Engineer of any facilities found. If damage should occur to the existing facilities, the utility company and the City must be notified immediately and, subject to Section 5 of the General Provisions, repairs acceptable to the utility company must be made at the Contractor's expense.

The Project Plans show the underground utilities on the site of the construction insofar as they are known to the City. 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.

If in the performance of the Work an existing utility is encountered that is not shown on the Project Plans and is not apparent or inferable from visual inspection of the Work site, the Inspector must be notified immediately. The Engineer will determine, subject to Section 5 of the General Provisions, whether the Project Plans or Technical Specifications should be modified, or whether the existing utility should be relocated or whether the Contractor must work around the existing utility. Subject to Section 5 of the General

Provisions, the Contractor must replace, at his or her own expense, in as good condition as they were prior to the start of construction, all existing improvements and surroundings damaged by his or her operation. Reconstruction of all existing improvements must conform to City of Healdsburg Public Works Standard Specifications and Details under the direction of and subject to the acceptance by the Engineer.

Subject to Section 5 of the General Provisions, should the Contractor fail to take adequate measures to avoid injury or damage to the facilities described above, the City may take any actions necessary to protect such facilities from the Contractor's operations. Subject to Section 5 of the General Provisions, the City may withhold the cost of injury to existing surface and underground utility facilities in and near the Work site from amounts due or that may become due the Contractor.

## **SECTION 6 Project Facilities**

**6-1.01 Work Site Offices.** Any Work site office facilities used by the Contractor and/or its privities must conform to all applicable codes, ordinances and regulations. The cost of such Work site office facilities will be paid from and included in the Contract Price.

**6-1.02 City Rights of Access and Ownership.** The City and its authorized representatives will at all reasonable times while such office facilities are located at the Work site (including, at a minimum, all times during which the Work is performed), have access to any such Work site office facilities used by the Contractor and/or its privities. With respect to the right of access of the City and its authorized representatives, neither the Contractor nor its privities will have a reasonable expectation of privacy pursuant to the Fourth Amendment to the Unites States Constitution or other applicable law concerning such Work site office facilities used by the Contractor and/or its privities. Without exception, any and all Project related materials located at such Work site facilities will be deemed at all times to be City property subject to inspection and copying by the City and its authorized representatives at all reasonable times while such facilities are located at the Work site (including, at a minimum, all times during which the Work is performed). Any interference by the Contractor or its privities with the City's rights of access and/or ownership pursuant to this Section 6 will constitute a material breach of the Contract subject to any and all remedies available pursuant to the Contract Documents and at law and equity.

## SECTION 7 Prosecution and Progress of the Work

**7-1.01 Liquidated Damages.** For the purposes of this Contract time is of the essence. The City and the Contractor agree that it will be difficult and/or impossible to determine the actual damage which the City will sustain in the event of the Contractor's failure to fully perform the Work or to fully perform all of the Contractor's obligations that have accrued pursuant to the Contract by the Time for Completion. Accordingly, the City and the Contractor agree in accordance with California Government Code Section 53069.85 that the Contractor will forfeit and pay to the City liquidated damages in the sum of **\$2,500** per day for each and every calendar day completion of the Work and/or performance of all of the Contractor's obligations that have accrued pursuant to the Contract is delayed beyond the Time for Completion. The City and the Contractor further agree in accordance with California Government Code Section 53069.85 that the liquidated damages sum specified in this provision is not manifestly unreasonable under the circumstances existing at the time the Contract was made, and that the City may deduct liquidated damages sums in accordance with this provision from any payments due or that may become due the Contractor under the Contract.

**7-1.02 No Damage for Avoidable Delays.** All delays in the Work that might have been avoided by the exercise of care, prudence, foresight and diligence of the Contractor or any privities of the Contractor will be deemed avoidable delays. Delays in the Work that may be unavoidable but that do not necessarily affect other portions of the Work or prevent completion of all Work within the Time for Completion, including, but not limited to, reasonable delays in Engineer approval of shop drawings, placement of construction survey stakes, measurements and inspection, and such interruption as may occur in prosecution of the Work due to reasonable interference of other contractors of the City, will be deemed avoidable delays. The Contractor will not be awarded a change in the Project schedule, the Time for Completion, and/or additional compensation in excess of the contract price for avoidable delays.

**7-1.03 Unavoidable Delays.** All delays in the Work that result from causes beyond the control of the Contractor and that the Contractor could not have avoided through exercise of care, prudence, foresight, and diligence will be deemed unavoidable delays. Orders issued by the City changing the amount of Work to be done, the quantity of materials to be furnished, or the manner in which the work is to be prosecuted, and unforeseen delays in the prosecution of the Work due to causes beyond the Contractor's control, such as strikes, lockouts, labor disturbances, fires, epidemics, earthquakes, acts of God, neglect by utility owners or other contractors that are not privities of the Contractor will be deemed unavoidable delays to the extent they actually delay the Contractor's completion of the Work. The Contractor will be awarded a change in the Project schedule, the Time for Completion, and/or additional compensation in excess of the contract price for unavoidable delays to the extent such delays actually delay the Contractor's completion of the Work and/or result in the Contractor incurring additional costs in excess of the Contract Price.

Delay due to normal, adverse weather conditions will not be deemed unavoidable. The Contractor should understand that normal adverse weather conditions are to be expected and plan the Work accordingly, such as by incorporating into the Project schedule normal, adverse weather delays as reflected in historical data of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce for the weather station most applicable to the Work site.

**7-1.04 No Damage for Contractor Caused Delay.** Contractor will not be entitled to additional compensation for extended field or home office overhead, field supervision, costs of capital, interest, escalation charges, acceleration costs or other impacts for any delays to the extent such delays are caused by the failure of the Contractor or any subcontractor or other entity engaged in performance of the Work to perform the Work in accordance with the Contract Documents.

**7-1.05 No Damage for Delay Not Caused By the City, Delay Contemplated by the Parties, or other Reasonable Delay.** Contractor will not be entitled to damages for delay to the Work caused by the following, which the City and Contractor agree will be deemed for purposes of California Public Contract Code Section 7102 either not caused by the City, and/or within the contemplation of the City and the Contractor, and/or reasonable under the circumstances:

- a. Exercise of the City's right to sequence the Work in a manner that would avoid disruption to the City and other contractors based on: the failure of the Contractor or any subcontractor or other entity engaged in the performance of the Work to perform the Work in accordance with the Contract Documents, enforcement by the City or any other governmental agency of competent jurisdiction of any government act or regulation, or enforcement by the City of any provisions of the Contract.
- b. Requests for clarification or information concerning the Contract Documents or proposed change orders or modifications to the Contract Documents, including extensive and/or numerous such requests for clarification or information or proposed change orders or modifications, provided such clarifications or information or proposed change orders or modifications are processed by the City or its representatives in a reasonable time in accordance with the Contract Documents.

**7-1.06 Delays Caused by the City and/or It's Privities.** Delay caused by the City and/or other contractors of the City will be deemed unavoidable delays. Either the City or the Contractor may propose a change in the Time for Completion and/or the Project schedule for delays that are purported to be caused by the City and/or its privities and that are not reasonable under the circumstances involved and/or that are not within the contemplation of the City and the Contractor. Such proposed changes in the Time for Completion will constitute change order proposals subject to Section 4. In accordance with Section 4, the City and the Contractor may agree upon pricing for the cost impacts, if any, resulting from such delays. If such pricing and/or changes in the Time for Completion and/or the Project schedule are in anticipation of impacts that may, but have not yet occurred, the City will be obligated to pay the Contractor for such anticipated impacts or to award a change in the Time for Completion and/or the Project schedule in accordance with the Contract and any applicable, approved change orders only to the extent the Contractor actually incurs the anticipated impacts. Notwithstanding anything to the contrary in Section 4, the City and the Contractor may agree to a daily rate or cap or lump sum that will apply to the cost impacts, if any, resulting from delay purportedly caused by the City and/or its privities subject to this provision. However, if such daily rate or cap or lump sum is in anticipation of cost impacts that have not yet occurred, the City will be obligated to pay such daily rate or cap or lump sum only to the extent the Contractor actually incurs such cost impacts.

**7-1.07 Delay Claims.** Whenever the Contractor claims a delay for which the Time for Completion may be extended, the Contractor must request an extension of time within five (5) days of the start of the delay. The request must be in writing and describe in detail the cause for the delay, and, if possible, the foreseeable extent of the delay.

#### **7-1.08 Contractor Coordination of the Work.**

- a. The City reserves the right to do other work in connection with or in the vicinity of the Project by contract or otherwise, and Contractor must at all times conduct the Work so as to impose no hardship on the City, others engaged in the Work or other contractors working at the Work site. The Contractor will adjust, correct and coordinate the Work with the work of others so that no delays result in the Work or other work at or near the Work site.
- b. If any part of the Work depends for proper execution or results upon the work of the City or any other contractor, the Contractor will, before proceeding with such Work, promptly report to the City any apparent discrepancies or defects in such other Work. Failure of the Contractor to promptly report any apparent discrepancy or defect will be deemed an acceptance of the City's or other contractor's Work as fit and proper.
- c. The Contractor will anticipate the relations of the various trades to the progress of the Work and will ensure that required anchorage or blocking is furnished and set at proper times. Anchorage and blocking necessary for each trade will be part of the Work except where stated otherwise.
- d. The Contractor will provide proper facilities at all times for access of the City, the Engineer, Architect, and other authorized City representatives to conveniently examine and inspect the Work.

## SECTION 8 Contractor Responsibilities

**8-1.01 Eligibility.** By executing the Contract, the Contractor certifies that the Contractor is not ineligible to perform work on public works projects pursuant to California Labor Code Sections 1777.1 or 1777.7. In accordance with California Public Contract Code Section 6109(a), contractors who are ineligible to perform work on public works projects pursuant to California Labor Code Sections 1777.1 or 1777.7 may neither bid on, be awarded or perform the Work. To the full extent permitted by law the Contractor will hold harmless, indemnify and defend the City from and against any and all damages, costs, and liability arising from or as a consequence of any violation of Public Contract Code Section 6109.

**8-1.02 Supervision of the Work.** The Contractor will be solely responsible for the performance of the Work, including portions of the Work to be performed by subcontractors. The Contractor is charged with ensuring that all orders or instructions from the City, Engineer or Architect are disseminated to and followed by all subcontractors engaged in performance of the Work. The Contractor will supervise the Work using the Contractor's best skill and attention. At any time during the progress of the Work, the City, the Engineer, or the Architect may require the Contractor and/or subcontractors engaged in performance of the Work to attend a Project meeting and the Contractor will attend, and ensure the attendance of any subcontractors whose attendance is required by the City and/or advisable in light of the matters to be addressed at the meeting.

**8-1.03 Contractor's Superintendent.** The Contractor will keep on the Work, throughout its progress, a competent superintendent and any necessary assistants, all satisfactory to the City. The superintendent may not be changed without the consent of the City. The superintendent will represent the Contractor and all directions given by the City to the superintendent will bind the Contractor in accordance with the Contract. Superintendent time included in Contractor's completed bid schedule and/or in approved change orders, if any, must be included in Contractor's approved overhead rate and may not be charged as a direct cost.

**8-1.04 Competent Employees.** The Contractor must at all times enforce strict discipline and good order among the Contractor's employees and may not employ on the Work any unfit person or anyone not skilled in the Work assigned, or anyone incompetent or unfit for the duties of that person. When the City determines that a Contractor employee does not satisfy the requirements of this provision, upon notice from the City, the Contractor must ensure that employee performs no further Work and is no longer present at the Work site. Any such Contractor employee may not again be employed on the Work without City approval.

**8-1.05 Items Necessary for Proper Completion of the Work.** Except as otherwise noted in the Contract Documents, the Contractor will provide and pay for all labor, materials, equipment, permits, fees, licenses, facilities and services necessary for the proper execution and timely completion of the Work in accordance with the Contract Documents.

### **8-1.06 Subcontracting.**

- a. The Contractor must perform with his or her own organization, a value of work amounting to not less than fifty percent (50%) of the contract amount, except that the bid amount for subcontracted "Specialty Items" if so designated in any Special Provisions may be eliminated from the contract amount and not considered as sub-contracted for the purposes of calculating the value of work to be performed by the Contractor. For the purposes of determining the value of work to be performed by the

Contractor pursuant to this provision, materials, equipment, incidentals, etc., shall be considered to have been purchased by the contractor or subcontractor that is to install them. Where a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated cost of such portion of the subcontracted item, as determined from information submitted by the Contractor, subject to approval by the Engineer.

- b. By executing the Contract, the Contractor certifies that no subcontractor included on the list of proposed subcontractors submitted with the Contractor's bid is ineligible to perform work on public works projects pursuant to California Labor Code Sections 1777.1 or 1777.7. In accordance with California Public Contract Code Section 6109(a), subcontractors who are ineligible to perform work on public works projects pursuant to California Labor Code Sections 1777.1 or 1777.7 may neither bid on, be awarded or perform as a subcontractor on the Work. In accordance with California Public Contract Code Section 6109(b), any contract on a public works project entered into between a contractor and a debarred subcontractor is void as a matter of law. The Contractor will ensure that no debarred subcontractor receives any public money for performing the Work, and any public money that may have been paid to a debarred subcontractor for the Work is returned to the City. The Contractor will be responsible for payment of wages to workers of a debarred subcontractor who has been allowed to perform the Work.
- c. The Contract and the performance of the Work are subject to the requirements of the Subletting and Subcontracting Fair Practices Act codified at California Public Contract Code Section 4100 and following. If the Contractor fails to specify a subcontractor or specifies more than one subcontractor for the same portion of the Work in excess of one-half of 1 percent of the Contractor's total bid, the Contractor agrees that the Contractor is fully qualified to perform that portion of the Work with the Contractor's own forces, and that the Contractor will perform that portion of the Work with the Contractor's own forces. If after award of the Contract the Contractor subcontracts, except as provided for in California Public Contract Code Sections 4107 or 4109, any such portion of the Work, the Contractor will be subject to the penalties set forth in California Public Contract Code Sections 4110 and 4111, including cancellation of the Contract, assessment of a penalty of up to 10 percent of the amount of the subcontract, and disciplinary action by the Contractors State License Board.
- d. No contractual relationship exists between the City and any subcontractor engaged in performance of the Work.
- e. Incorporation of Contract Documents. Contractor agrees to include with all subcontractors in their subcontract the same requirements and provisions of this Contract including the indemnity and insurance requirements to the extent they apply to the scope of the Subcontractor's work. Subcontractors hired by Contractor agree to be bound to Contractor and City in the same manner and to the same extent as Contractor is bound to City under the Contract Documents. Subcontractor further agrees to include these same provisions with any sub-subcontractor. A copy of the City's Contract Document indemnity and insurance provisions will be furnished to the subcontractor upon request. The Contractor shall require all sub-contractors to provide a valid certificate of insurance and the required endorsements included in the agreement prior to commencement of any work and contractor will provide proof of compliance to the City. The Contractor will be solely responsible for any delay or additional costs incurred as a result of its failure to provide adequate or accurate Project information to a subcontractor that results in improper submittals and/or Work,

or time or other impacts. The Contractor will have all of the obligations and the City will have all of the remedies that are specified in Section 11 concerning any delay or additional costs incurred due to failure of the Contractor to provide adequate and accurate Project information to subcontractors.

- f. Coordination of Subcontract Work: The Contractor is responsible for scheduling the Work of subcontractors so as to avoid delay or injury to either Work or materials.
- g. Subcontractor agrees to be bound to Contractor and City in the same manner and to the same extent as Contractor is bound to City under the Contract Documents. Subcontractor further agrees to include the same requirements and provisions of this agreement, including the indemnity and Insurance requirements, with any sub-subcontractor to the extent they apply to the scope of the sub-subcontractor's work. A copy of the City's Contract Document indemnity and insurance provisions will be furnished to the Subcontractor upon request.

#### **8-1.07 Insurance.**

- a. All required insurance must be provided in the form of "occurrence"-type policies underwritten by admitted insurers in the State of California with a rating of A or better from the current year Best Rating Guide. All policies must be issued at the expense of the Contractor and must be maintained at the Contractor's expense throughout the performance of the Work. Contractor shall maintain insurance as required by this contract to the fullest amount allowed by law and shall maintain insurance for a minimum of 2 years following the completion of this project. In the event contractor fails to obtain or maintain completed operations coverage as required by this Contract, the City at its sole discretion may purchase the coverage required and the cost will be paid by Contractor.
- b. Contractor agrees to include with all subcontractors in their subcontract the same requirements and provisions of this contract including the indemnity and Insurance requirements to the extent they apply to the scope of the Subcontractor's work. Contractor shall require all sub-contractors to provide a valid certificate of insurance and the required endorsements included in the Contract prior to commencement of any work and Contractor will provide proof of compliance, upon request, to the City.
- c. Subcontractor hired by the Contractor agree to be bound to the Contractor and the City in the same manner and to the same extent as Contractor is bound to the City under the Contract. Subcontractor further agrees to include the same requirements and provisions of this Contract, including the Indemnity and Insurance requirements, with any Subcontractor to the extent they apply to the scope of the Subcontractor's work. A copy of the Contract Indemnity and Insurance provisions will be furnished to the Subcontractor upon request
- d. The Contractor and any Subcontractors engaged in performance of the Work must secure payment of workers compensation in accordance with California Labor Code Section 3700 and other applicable law. The Contractor must verify that all Subcontractors comply with this requirement.
- e. Within ten working days following the Notice of Award, the Contractor must submit to the City acceptable certificates of insurance, declarations page(s) and endorsements evidencing that the Contractor has the required insurance in effect and will maintain it

throughout the performance of the Work, and beyond as applicable, the following kinds and amounts of insurance:

1. The minimum limits of the Commercial General Liability (including bodily injury, personal injury and property damage) insurance shall be:
  - \$10,000,000 aggregate
  - \$5,000,000 occurrence

If the work to be performed involves any excavation, the policy shall include an endorsement that affords coverage for explosion, collapse and underground hazards.

2. If the work to be performed involves vehicles or vehicular equipment, the Automobile insurance limit shall be:
  - \$5,000,000 per accident for bodily injury and property damage

3. Automobile coverage should be at least as broad as Insurance Services Automobile Liability form CA 0001 Code 1 ("any auto"). No endorsement may be attached limiting the coverage. Anything less than 'any auto' coverage must be approved by the Risk Manager prior to approval. If the Risk Manager accepts anything less than 'any auto', additional information such as a schedule of covered autos, proof of personal auto liability coverage, or verification statement may be required by the City.

4. Worker's Compensation Insurance. Proof of Workers Compensation and Employers Liability insurance as required by any applicable law, regulation or statute, including the provisions of Division IV of the Labor Code of the State of California, and any act or acts amending it. Worker's compensation insurance must be for Statutory Limits and must cover the full liability of the Contractor. The Contractor's Employer's Liability Insurance must be in an amount no less than \$1,000,000.00 per occurrence. The workers' compensation policy must be endorsed with a waiver of subrogation. The insurance company, in its endorsement, must agree to waive all rights of subrogation against the City, its officers, officials, employees, agents and volunteers for losses paid under the terms of such policy.

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

f. Additional Requirements

- i. Endorsements must add the City, its officials, officers, employees, agents and volunteers as an additional insured ("Additional Insured"). Examples of City approved insurance forms are included in this package. If the Contractor provides policy pages or broad forms of endorsement the insurance carrier will be asked to sign, initial and date all applicable sections of the document which conveys coverage to the City.

- ii. It shall be a requirement under this Contract that any available insurance proceeds broader than or in excess of the specified minimum Insurance coverage requirements and/or limits shall be available to the Additional Insured. Furthermore, the requirements for coverage and limits shall be (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any Insurance policy or proceeds available to the name insured; which ever greater.
- iii. The Additional Insured coverage under the Contractor's policy shall be "primary and non-contributory" and Contractor will not seek contribution from the City of Healdsburg's insurance or self-insurance and shall be at least as broad as CG 20 01 04 13.
- iv. The Contractor shall provide the City with a 30 day written notice of any reduction or cancellation of such insurance required to be furnished by the Contractor; and include a severability of interest clause acceptable to the City and if requested by the City.
- v. If an Umbrella or Excess Policy is used to satisfy the requirements, an endorsement form must be provided from the insurance carrier/broker and that Umbrella/Excess Policy 'follows form' or is 'continuous' to the General liability and/ Auto liability policy in addition to the required endorsement.
- vi. The City will provide examples of approved standard and preferred forms of endorsements. If the Contractor's insurance carrier chooses to use forms other than the City's approved forms, such forms shall be subject to the prior approval of the City. If the Contractor provides policy pages instead of an endorsement the insurance agent/broker will be asked to sign, initial and date all applicable sections of the policy that meet the City's insurance requirements.
- g. All self-insured retentions (SIR) must be disclosed to City for approval and shall not reduce the limits of liability. Policies containing any self-insured retention (SIR) provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named Insured or the City, The City reserves the right to obtain a full certified copy of any Insurance policy and endorsements. Failure to exercise this right shall not constitute a waiver of right exercise later.

**Contractor's failure to provide insurance certificates and endorsement forms that are acceptable to the City within ten (10) working days of notice of award of contract shall:**

- i. constitute a failure to complete the "Contract Documents Checklist" as described on page 36
  - (ii) entitle the City to rescind any contract award
  - (iii) result in a forfeiture of Contractor's bid bond or other form of bid security.
- h. Contractor must continue to provide approved forms of insurance certificates, declarations page(s) and endorsements that meet the requirements of Section 8-1.07 of the Contract

Documents for 2 years (To be completed by Risk Management) following recordation of a Notice of Completion or other form of notice of project completion provided by City.

CITY APPROVED STANDARD CERTIFICATE FORM

<b>CERTIFICATE OF INSURANCE</b>			ISSUE DATE (MM/DD/YYYY)		
<b>CITY OF HEALDSBURG (the "City")</b>					
<b>PRODUCER</b>			THIS CERTIFICATE OF INSURANCE IS NOT AN INSURANCE POLICY AND DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.		
			<b>COMPANIES</b> <b>BEST'S RATING</b>		
			COMPANY LETTER	<b>A</b> _____	
				<b>B</b> _____	
				<b>C</b> _____	
				<b>D</b> _____	
				<b>E</b> _____	
<b>INSURED</b>					
THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.					
CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	ALL LIMITS IN THOUSANDS
	<b>GENERAL LIABILITY</b>				GENERAL AGGREGATE \$ _____
	<input type="checkbox"/> COMMERCIAL GENERAL LIABILITY				PRODUCTS-COM P/OPS AGGREGATE \$ _____
	<input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> OCCUR.				PERSONAL & ADVERTISING INJURY \$ _____
	<input type="checkbox"/> OWNER'S & CONTRACTOR'S PROT.				EACH OCCURRENCE \$ _____
	<input type="checkbox"/> OTHER _____				FIRE DAMAGE (ANY ONE FIRE) \$ _____
					MEDICAL EXPENSE (Any One Person) \$ _____
	<b>AUTOMOBILE LIABILITY</b>				COMBINED SINGLE LIMIT \$ _____
	<input type="checkbox"/> ANY AUTO				BODILY INJURY (PER PERSON) \$ _____
	<input type="checkbox"/> ALL OWNED AUTOS				
	<input type="checkbox"/> SCHEDULED AUTOS				BODILY INJURY (PER ACCIDENT) \$ _____
	<input type="checkbox"/> HIRED AUTOS				
	<input type="checkbox"/> NON-OWNED AUTOS				PROPERTY DAMAGE \$ _____
	<input type="checkbox"/> GARAGE LIABILITY				
	<b>EXCESS LIABILITY</b>				
	<input type="checkbox"/> UMBRELLA				EACH OCCURRENCE \$ _____
	<input type="checkbox"/> OTHER THAN UMBRELLA FORM				AGGREGATE \$ _____
	<input type="checkbox"/> WORKER'S COMPENSATION & EMPLOYER'S LIABILITY				STATUTORY \$ _____
					EACH ACCIDENT \$ _____
					DISEASE-POLICY LIMIT \$ _____
					DISEASE-EACH EMPLOYEE \$ _____
	<b>PROPERTY INSURANCE</b>				
	<input type="checkbox"/> COURSE OF CONSTRUCTION				AMOUNT OF INSURANCE \$ _____
DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / RESTRICTIONS / SPECIAL ITEMS					
<b>THE FOLLOWING PROVISIONS APPLY:</b>					
1. None of the above-described policies will be canceled until after 30 days' written notice has been given to the City at the address indicated below.					
2. The City, its officials, officers, employees, volunteers and agents are added as insureds on all liability					
<b>CERTIFICATE HOLDER / ADDITIONAL INSURED</b>			<b>AUTHORIZED REPRESENTATIVE</b>		
CITY OF HEALDSBURG			SIGNATURE		
401 GROVE STREET			TITLE		
HEALDSBURG, CA 95448			PHONE NO.		



CITY APPROVED STANDARD ENDORSEMENT FORM

<b>INSURER</b> <b>POLICY NO.</b> <b>ENDORSEMENT NO:</b>	<b>ISO FORM CG 20 26 11 85 (MODIFIED)</b> <b>COMMERCIAL GENERAL LIABILITY</b>  EXHIBIT 1-C
<p><b>THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY</b></p> <p><b>ADDITIONAL INSURED - DESIGNATED PERSON OR ORGANIZATION</b></p>	
This endorsement modifies insurance provided under the following:	
<b>COMMERCIAL GENERAL LIABILITY COVERAGE PART.</b>	
<b>SCHEDULE</b>	
<b>Name of Person or Organization:</b>	
(If no entry appears above, the information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement).	
WHO IS INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule as an insured but only with respect to liability arising out of your operations or premises owned or rented to you.	
<b>Modifications to ISO for CG 20 26 11 85:</b>	
1) "Operation" includes the named insured's products.	
2) The insured scheduled above includes the Insured's officers, officials, employees, volunteers and agents.	
3) This insurance shall be primary as respects the insured shown in the schedule above, or if excess, shall stand in an unbroken chain of coverage excess of the Named Insured's scheduled underlying primary coverage. In either event, any other insurance maintained by the Insured scheduled above shall be in excess of this insurance and shall not be called upon to contribute with it.	
4) The insurance afforded by this policy shall not be canceled except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the Agency.	
Signature - Authorized Representative _____	
Address _____	
_____	
_____	

CITY APPROVED STANDARD ENDORSEMENT FORM

<b>AUTOMOBILE LIABILITY SPECIAL ENDORSEMENT</b>		
<b>For the City of Healdsburg</b>	ENDORSEMENT NO.	ISSUE DATE (DD/MM/YYYY)
<b>PRODUCER</b>	<b>POLICY INFORMATION</b>	
	Insurance Company:	
	Policy No:	
	Policy Period: (from) _____ (to) _____	
	LOSS ADJUSTMENT EXPENSE <input type="checkbox"/> Included in Limits	
	<input type="checkbox"/> In Addition to Limits	
Telephone _____	<input type="checkbox"/> Deductible <input type="checkbox"/> Self-Insured Retention (check which) of \$ _____	
<b>NAMED INSURED</b>	<p>APPLICABILITY. This insurance pertains to the operation and/or tenancy of the named insured under all written agreements and permits in force with the City unless checked here p in which case only the following specific agreements and permits with the City are covered:</p> <p>City AGREEMENTS / PERMITS</p>	
<b>TYPE OF INSURANCE</b>	<b>OTHER PROVISIONS</b>	
<input type="checkbox"/> COMMERCIAL AUTO POLICY		
<input type="checkbox"/> BUSINESS AUTO POLICY		
<input type="checkbox"/> OTHER _____		
<b>LIMIT OF LIABILITY</b>	<b>CLAIMS:</b> Underwriter's representative for claims pursuant to this insurance.	
\$ _____ per accident, for bodily injury and property damage.	Name: _____	
	Address: _____	
	Telephone: ( _____ ) _____	
<p>In consideration of the premium charged and notwithstanding any inconsistent statement in the policy to which this endorsement is attached or any endorsement now or hereafter attached thereto, it is agreed as follows:</p> <p>2. CONTRIBUTION NOT REQUIRED. As respects work performed by the Named Insured for or on behalf of the City the insurance afforded by this policy shall: (a) be primary insurance as respects the City, its officers, officials, employees, volunteers and agents; or (b) stand in an unbroken chain of coverage excess of the Named Insured's primary coverage. Any insurance or self-insurance maintained by the City its officers, officials, employees, volunteers and agents shall be excess of the Named Insured's insurance and not contribute with it.</p> <p>3. CANCELLATION NOTICE. With respect to the interests of the City this insurance shall not be cancelled, except after thirty (30) days prior written notice by receipted delivery has been given to the City</p> <p>4. SCOPE OF COVERAGE. This policy affords coverage at least as broad as:                  (1) If primary, Insurances Services Office form number CA0001 (Ed.1/87), Code 1 ("any auto"); or                  (2) If excess, affords coverage which is at least as broad as the primary insurance forms referenced in the preceding section (1).</p> <p>Except as stated above nothing herein shall be held to waive, alter or extend any of the limits, conditions, agreements or exclusions of the policy to which this endorsement is attached.</p>		
<b>ENDORSEMENT HOLDER</b>	<b>AUTHORIZED REPRESENTATIVE</b>	
	<input type="checkbox"/> Broker / Agent <input type="checkbox"/> Underwriter <input type="checkbox"/> _____	
<b>THE CITY OF HEALDSBURG 401 GROVE STREET HEALDSBURG, CA 95448</b>	I _____ (print / type name), warrant that I have authority to bind the above-mentioned insurance company and by my signature hereon do so bind this company to this endorsement.	
	Signature _____	
	Telephone ( _____ ) _____	Date Signed _____

CITY APPROVED STANDARD ENDORSEMENT FORM

**WORKER'S COMPENSATION AND EMPLOYER'S LIABILITY  
SPECIAL ENDORSEMENT**

For The City of Healdsburg (the City)

ENDORSEMENT NO.

ISSUE DATE (DD/MM/YYYY)

<p><b>PRODUCER</b></p> <p>Telephone _____</p>	<p><b>POLICY INFORMATION</b></p> <p>Insurance Company _____</p> <p>Policy No: _____</p> <p>Policy Period: (from) _____ (to) _____</p>
<p><b>NAMED INSURED</b></p>	<p><b>OTHER PROVISIONS</b></p>
<p><b>CLAIMS:</b> Underwriter's representative for claims pursuant to this insurance.</p> <p>Name: _____</p> <p>Address: _____</p> <p>_____</p> <p>Telephone: ( _____ ) _____</p>	<p><b>EMPLOYERS LIABILITY LIMITS</b></p> <p>\$ _____ (Each Accident)</p> <p>\$ _____ (Disease - Policy Limit)</p> <p>\$ _____ (Disease - Each Employee)</p>
<p>In consideration of the premium charged and notwithstanding any inconsistent statement in the policy to which this endorsement is attached or any endorsement now or hereafter attached thereto, it is agreed as follows:</p> <ol style="list-style-type: none"> <li>1. CANCELLATION NOTICE. This insurance shall not be cancelled, except after thirty (30) days prior written notice by receipted delivery has been given to the City.</li> <li>2. WAIVER OF SUBROGATION. This Insurance Company agrees to waive all rights of subrogation against the City, its officers, officials, employees, volunteers and agents for losses paid under the terms of this policy which arise from the work performed by the Named Insured for the City.</li> </ol> <p>Except as stated above nothing herein shall be held to waive, alter or extend any of the limits conditions, agreements or exclusions of the policy to which this endorsement is attached.</p>	
<p><b>ENDORSEMENT HOLDER</b></p> <p><b>CITY OF HEALDSBURG 401 GROVE STREET HEALDSBURG CA, 95448</b></p>	<p><b>AUTHORIZED REPRESENTATIVE:</b> ___ Broker / Agent ___ Underwriter _____</p> <p>I _____ (print / type name), warrant that I have authority to bind the above-mentioned insurance company and by my signature hereon do so bind this company to this endorsement.</p> <p>Signature _____ (original signature required)</p> <p>Telephone ( _____ ) Date Signed _____</p>

CITY APPROVED PREFERRED ENDORSEMENT FORM

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR  
CONTRACTORS – AUTOMATIC STATUS FOR OTHER  
PARTIES WHEN REQUIRED IN WRITTEN  
CONSTRUCTION AGREEMENT**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

**A. Section II – Who Is An Insured** is amended to include as an additional insured:

1. Any person or organization for whom you are performing operations when you and such person or organization have agreed in writing in a contract or agreement that such person or organization be added as an additional insured on your policy; and
2. Any other person or organization you are required to add as an additional insured under the contract or agreement described in Paragraph 1. above.

Such person(s) or organization(s) is an additional insured only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

- a. Your acts or omissions; or
- b. The acts or omissions of those acting on your behalf;

in the performance of your ongoing operations for the additional insured.

However, the insurance afforded to such additional insured described above:

- a. Only applies to the extent permitted by law; and
- b. Will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

A person's or organization's status as an additional insured under this endorsement ends when your operations for the person or organization described in Paragraph 1. above are completed.

**B.** With respect to the insurance afforded to these additional insureds, the following additional exclusions apply:

This insurance does not apply to:

1. "Bodily injury", "property damage" or "personal and advertising injury" arising out of the rendering of, or the failure to render, any professional architectural, engineering or surveying services, including:
  - a. The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; or
  - b. Supervisory, inspection, architectural or engineering activities.

This exclusion applies even if the claims against any insured allege negligence or other wrongdoing in the supervision, hiring, employment, training or monitoring of others by that insured, if the "occurrence" which caused the "bodily injury" or "property damage", or the offense which caused the "personal and advertising injury", involved the rendering of, or the failure to render, any professional architectural, engineering or surveying services.

2. "Bodily injury" or "property damage" occurring after:
  - a. All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the location of the covered operations has been completed; or

b. That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

C. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

The most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement described in Paragraph A.1.; or

2. Available under the applicable Limits of Insurance shown in the Declarations; whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

## 8-1.09 Indemnities

- a. The Contractor will take all responsibility for the Work, and will bear all losses and damages directly or indirectly resulting to the Contractor, any subcontractors engaged in performance of the Work, the City, its officials, officers, employees, agents, volunteers and consultants, and to third parties on account of the performance or character of the Work, unforeseen difficulties, accidents, or occurrences of other causes predicated on active or passive negligence of the Contractor or of any subcontractor engaged in performance of the Work. To the fullest extent permitted by law the Contractor will indemnify, defend and hold harmless the City, its officials, officers, employees, agents, volunteers and consultants from and against any or all loss, liability, expense, claims, costs (including costs of defense), suits, and damages of every kind, nature and description (including, but not limited to, penalties resulting from exposure to hazards in violation of the California Labor Code) directly or indirectly arising from the performance of the Work (“Claims”). The Contractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this agreement for the full period of time allowed by law.
- b. The Contractor will indemnify, defend and hold harmless the City, the City's officials, officers, employees, volunteers, agents and the Engineer and the Architect for all liability on account of any patent rights, copyrights, trade names or other intellectual property rights that may apply to the Contractor's performance of the Work. The Contractor will pay all royalties or other charges as a result of intellectual property rights that may apply to methods, types of construction, processes, materials, or equipment used in the performance of the Work, and will furnish written assurance satisfactory to the City that any such charges have been paid.
- c. The Contractor assumes all liability for any accident or accidents resulting to any person or property as a result of inadequate protective devices for the prevention of accidents in connection with the performance of the Work. The Contractor will indemnify, defend, and hold harmless the City and its officials, officers, employees, agents, volunteers and consultants from such liability.
- d. The defense and indemnification obligations in this Contract are undertaken in addition to, and shall not in any way be limited by the insurance obligations contained in this Agreement. Sections 8-1.08 or 8-1.09. The Contractor will defend, with legal counsel reasonably acceptable to the City, any action or actions filed in connection with any Claims and will pay all related costs and expenses, including attorney's fees incurred. The Contractor will promptly pay any judgment rendered against the City, its officials, officers, employees, agents, volunteers or consultants for any Claims. In the event the City, its officials, officers, employees, agents, volunteers or consultants is made a party to any action or proceeding filed or prosecuted against Contractor for any Claims, Contractor agrees to pay the City, its officials, officers, employees, agents, volunteers and consultants any and all costs and expenses incurred in such action or proceeding, including but not limited to, reasonable attorneys' fees.

- e. Subject to the requirements of Section 5 of the General Provisions, the Contractor will indemnify, hold harmless and defend with legal counsel reasonably acceptable to the City the City and its officials, officers, employees, agents and volunteers from and against any and all Claims related to damage to surface or underground facilities caused by the Contractor or any of the Contractor's privities or agents.
- f. The Contractor will indemnify, hold harmless and defend with legal counsel reasonably acceptable to the City the City and its officials, officers, employees, agents and volunteers from and against any and all Claims, including any fines or other penalties, related to failure of the Contractor and/or privities or agents of the Contractor to comply with the requirements of the General Permit, or to implement the SWPPP in accordance with provision 12-1.04 of the Contract. The City may withhold from amounts due or that may become due the Contractor under this Contract amounts that equal or are estimated to equal the amount of Claims, including fines, resulting from failure of the Contractor and/or privities or agents of the Contractor to comply with the requirements of the General Permit, or to implement the SWPPP in accordance with provision 12-1.04 of the Contract.
- g. In accordance with California Civil Code Section 2782(a), nothing in the Contract will be construed to indemnify the City for its sole negligence, willful misconduct, or for defects in design furnished by City. In accordance with California Civil Code Section 2782(b), nothing in the Contract will be construed to impose on the Contractor or to relieve the City from liability for the City's active negligence. By execution of the Contract Documents the Contractor acknowledges and agrees that the Contractor has read and understands the insurance and indemnity requirements of the Contract Documents, which are material elements of consideration.
- h. Contractor's and subcontractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Contract for the full period of time allowed by law.
- i. The defense and indemnification obligations of this Contract are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Contract.

**8-1.10 Licenses/Permits.** The Contractor must, without additional expense to the City, obtain all licenses, permits and other approvals required for the performance of the Work. This would include a valid City Business license.

**8-1.11 California Labor Code Requirements.**

- a. In accordance with California Labor Code Section 1810, eight (8) hours of labor in performance of the Work will constitute a legal day's work under the Contract.
- b. In accordance with California Labor Code Section 1811, the time of service of any worker employed in performance of the Work is limited to eight hours during any one calendar day, and forty hours during any one calendar week, except in accordance with California Labor Code Section 1815, which provides that work in excess of eight hours during any one calendar day and forty hours during any one calendar week is permitted upon compensation for all hours worked in excess of eight hours during any one calendar day

and forty hours during any one calendar week at not less than one-and-one-half times the basic rate of pay.

- c. The Contractor and its subcontractors will forfeit as a penalty to the City \$25 for each worker employed in the performance of the Work for each calendar day during which the worker is required or permitted to work more than eight (8) hours in any one calendar day, or more than forty (40) hours in any one calendar week, in violation of the provisions of California Labor Code Section 1810 et seq.
- d. In accordance with California Labor Code Section 1773.2, the City has determined the general prevailing wages in the locality in which the Work is to be performed for each craft or type of work needed to be as published by the State of California Department of Industrial Relations, Division of Labor Statistics and Research, a copy of which is on file in the Public Works Department and will be made available on request. The Contractor and subcontractors engaged in the performance of the Work must pay no less than these rates to all persons engaged in performance of the Work.
- e. In accordance with California Labor Code Section 1775, the Contractor and any subcontractors engaged in performance of the Work must comply Labor Code Section 1775 which establishes a penalty of up to \$50 per day for each worker engaged in the performance of the Work that the Contractor or any subcontractor pays less than the specified prevailing wage. The amount of such penalty will be determined by the Labor Commissioner. The Contractor or subcontractor must pay the difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate. If a subcontractor worker engaged in performance of the Work is not paid the general prevailing per diem wages by the subcontractor, the Contractor is not liable for any penalties therefore unless the Contractor had knowledge of that failure or unless the Contractor fails to comply with all of the following requirements:
  - 1. The contract executed between the Contractor and the subcontractor for the performance of part of the Work must include a copy of the provisions of California Labor Code Sections 1771, 1775, 1776, 1777.5, 1813, and 1815.
  - 2. The Contractor must monitor payment of the specified general prevailing rate of per diem wages by the subcontractor by periodic review of the subcontractor's certified payroll records.
  - 3. Upon becoming aware of a subcontractor's failure to pay the specified prevailing rate of wages, the Contractor must diligently take corrective action to halt or rectify the failure, including, but not limited to, retaining sufficient funds due the subcontractor for performance of the Work.
  - 4. Prior to making final payment to the subcontractor, the Contractor must obtain an affidavit signed under penalty of perjury from the subcontractor that the subcontractor has paid the specified general prevailing rate of per diem wages employees engaged in the performance of the Work and any amounts due pursuant to California Labor Code Section 1813.
  - 5. In accordance with California Labor Code Section 1776, the Contractor and each subcontractor engaged in performance of the Work, must keep accurate payroll records 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 in performance of the Work. Each payroll record must contain or be verified by a written declaration that it is made under penalty of perjury, stating that the information contained in the payroll record is true and correct and that the employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by the employer's employees on the public works project. The payroll records required pursuant to California Labor Code Section 1776 must be certified and must be available for inspection by the City and its authorized representatives, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations and must otherwise be available for inspection in accordance with California Labor Code Section 1776.

- f. In accordance with California Labor Code Section 1777.5, the Contractor, on behalf of the Contractor and any subcontractors engaged in performance of the Work, will be responsible for ensuring compliance with California Labor Code Section 1777.5 governing employment and payment of apprentices on public works contracts.
- g. In case it becomes necessary for the Contractor or any subcontractor engaged in performance of the Work to employ on the Work any person in a trade or occupation (except executive, supervisory, administrative, clerical, or other non-manual workers as such) for which no minimum wage rate has been determined by the Director of the Department of Industrial Relations, the Contractor must pay the minimum rate of wages specified therein for the classification which most nearly corresponds to Work to be performed by that person. The minimum rate thus furnished will be applicable as a minimum for such trade or occupation from the time of the initial employment of the person affected and during the continuance of such employment.

**8-1.12 Laws and Ordinances.** The Contractor and all subcontractors engaged in the performance of the Work must conform to the following specific rules and regulations as well as all other laws, ordinances, rules and regulations that apply to the Work. Nothing in the Technical Specifications or Project Plans is to be construed to permit Work not conforming to these codes:

- National Electrical Safety Code, U. S. Department of Commerce
- National Board of Fire Underwriters' Regulations
- California Building Standards Code as adopted by the City
- Manual of Accident Prevention in Construction, latest edition, published by A.G.C. of America
- Industrial Accident Commission's Safety Orders, State of California
- Regulations of the State Fire Marshall (Title 19, California Code of Regulations) and Applicable Local Fire Safety Codes
- Labor Code of the State of California - Division 2, Part 7, Public Works and Public Agencies.
- Federal, state, and local air pollution control laws and regulations applicable to the Contractor and/or the Work.

**8-1.13 Guaranty.** The Contractor guarantees all of the Work for one year from the date the City accepts the Work. Upon receiving written notice of a need for repairs which are directly attributable to defective materials or workmanship the Contractor must make good any defects arising or discovered in any part of the Work by diligently commencing the

necessary repairs within seven (7) days from the date of notice from the City. If the Contractor fails to make good any defects in the Work in accordance with this provision, in addition to any other available remedy under the Contract or at law or equity, the City may make good or have made good such defects in the Work and deduct the cost from amounts that may be due or become due the Contractor, and/or call on the Contractor's maintenance bond for the cost of making good such defects and for the City's reasonable legal costs, if any, of recovering against the bond. The Contractor will remain responsible for repairing any Work found to be defective regardless of when such defect is discovered by the City.

**8-1.14 Assignment of Unfair Business Practice Claims.** In accordance with California Public Contract Code Section 7103.5, the Contractor and any subcontractors offer and agree to assign to the City all rights, title, and interest in and to all causes of action the Contractor or any subcontractors may have under Section 4 of the Clayton Act (15 U.S.C. § 15) or under the Cartwright Act (Chapter 2 (commencing with § 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to this Contract. This assignment will be made and become effective at the time the City tenders final payment to the Contractor, without further acknowledgement by the parties.

## SECTION 9 Measurement and Payment

**9-1.01 F.O.B.** All shipments must be F.O.B. destination to the Work site and/or other sites indicated in the Contract Documents. The Contract Price is all-inclusive (including sales tax). There will be no additional compensation paid for containers, packing, unpacking, drayage or insurance.

### 9-1.02 Payment

- a. The Contractor must submit to the Engineer his or her partial payment estimate on the 15th day of the month. When the 15th falls on a weekend or holiday submittal must be on the first workday prior to the 15th. The partial payment estimate must be a verified application for payment and schedule of values supported by a statement showing all materials actually installed during the preceding month and the cost of labor actually expended in the performance of the Work. The Contractor must also provide information with the payment that includes bid item identification and % complete/remaining. Unless otherwise provided in the Contract Documents, no allowances or payments will be made for material or equipment not placed at the Work site.
- b. Within ten (10) days after the issuance of the Notice to Proceed, the Contractor shall furnish to the City a detailed Schedule of Values giving a complete breakdown of large lump sum prices and items which include numerous subdivisions of work. The Contractor and City shall jointly review the Schedule of Values and make any adjustments in value allocations if, in the opinion of the City, changes are necessary to establish fair and reasonable allocation of values for the Work components. Front end loading will not be permitted. If, in the City's judgment, more detail (i.e. more items of work) is necessary, the Contractor shall add the additional items identified by the City. The City may also require reallocation of Work components from items in the preliminary schedule if such are allocation is necessary. The Contractor shall submit any necessary revisions for the completed Schedule of Values within 15 days from the Notice to Proceed. The costs indicated in making up this breakdown will be used as a basis for partial payments and shall not be considered as fixing a basis of additions or deductions from the contract.
- c. To be eligible for payment the Contractor's applications for payment must be accompanied by certified payroll reports, including "Statement of Non-Performance" for periods where no Work was performed. Certified payroll shall be prepared in accordance with California Labor Code Section 1776 and the Contract for each employee of the Contractor and any subcontractors engaged in the performance of the Work during the preceding months. Applications for payment will not be processed without certified payroll reports.
- d. In accordance with California Public Contract Code Section 20104.50, the City will review applications for payment as soon as practicable after receipt. Any application or part of an application that is determined to be improper will be returned to the Contractor as soon as practicable, but no later than seven days after receipt by the City, along with a written description of the reasons why the application is improper. The Contractor's failure to submit a schedule by the time specified in Section 3-1.08, or its submission of a schedule to which the City has taken any uncorrected exception, will serve as a basis for returning an application for payment in its entirety.
- e. Unless the Contractor has elected to post securities in lieu of retention in accordance with California Public Contract Code Section 22300 and the Contract, and the Contractor and the City have executed an escrow agreement in accordance with the Public Contract Code

and the Contract, the City will make progress payments to the Contractor in accordance with applicable law in the amount of ninety-five (95) percent of the value of the labor actually performed and the material incorporated in the Work as specified in Contractor's verified application for payment upon approval by the City's authorized representative(s). Payment of progress payments will not be construed as acceptance of the Work performed. If the Contractor has elected to post securities in lieu of retention in accordance with Public Contract Code Section 22300 and the Contract and the Contractor and the City have executed an escrow agreement in accordance with the Public Contract Code and the Contract, the City will make payments to the Contractor or the Contractor's escrow agent in accordance with such escrow agreement.

- f. Wherever the estimated quantities of Work to be done and materials to be furnished on a unit price basis under this Contract are specified in any of the Contract Documents, including the proposal, such quantities are specified for purposes of comparing bids, and the right is expressly reserved, except as otherwise expressly provided, to increase or diminish such quantities as may be deemed reasonably necessary or desirable by the Engineer to complete the Work. No such increase or diminution will be a basis for claims for adjustments in the Contract Price other than adjustments necessary to reflect the impacts of such changes in quantities based on the applicable contract prices and/or pursuant to Section 4 of this Contract.
- g. In accordance with California Public Contract Code Section 20104.50, if the City fails to make a progress payment within thirty (30) days of receipt of an undisputed, properly submitted application for payment, the City will pay the Contractor interest equivalent to the legal rate set forth in subdivision (a) of California Code of Civil Procedure Section 685.010. The number of days available to the City to make a payment without incurring an interest obligation pursuant to this provision and California Public Contract Code Section 20104.50 will be reduced by the number of days, if any, by which the City has delayed return of an application for payment beyond the seven day return requirement set forth in Section 9-1.02(d).
- h. The City will pay the Contractor's final invoice in accordance with applicable law and this Section 9 following acceptance of the Work provided that:
  - i. The Contractor has furnished evidence satisfactory to the City that all claims for labor and material have been paid, or the time for filing valid stop notices has passed and no stop notices have been filed, or all stop notices filed have been released by valid release or release bond acceptable to the City.
  - ii. No claim has been presented to the City by any person based upon any acts or omissions of the Contractor or any subcontractor engaged in the performance of the Work.
  - iii. No other claim or dispute exists under the Contract or applicable law concerning payment of the Contractor's final invoice and/or release of the Contract retention.
  - iv. The Contractor has filed with the City the Maintenance Bond provided in the Contract Documents with duly notarized signatures of an authorized representative of the Contractor and an attorney-in-fact of an admitted surety insurer acceptable to the City and such Maintenance Bond binds the Contractor as Principal and the Surety in accordance with its terms in the amount of 10% of the final Contract Price.

**9-1.03 Non-Allowable Direct Charges.** The following costs are not allowable direct charges under the Contract. The following costs may only be paid under the Contract, if at all, as part of any allowance for contractor overhead and/or profit established under the Contract.

- a. Labor costs in excess of applicable prevailing wages pursuant to the Contract and applicable law, liability and workers compensation insurance, social security, retirement and unemployment insurance and other employee compensation and benefits pursuant to bona fide compensation plans in effect at the time specified for the opening of Project bids for contractor and subcontractor employees engaged in the performance of the Work, or in excess of the labor costs specified in provision 4-1.05 of this Contract in the case of cost impacts involving items for which the Contract Documents do not specify prices, and for which no lump sum amount has been approved by the City. However, in no event will allowable direct labor charges under the Contract include employee bonuses, employee vehicles or vehicle allowances, employee telephones or telephone allowances, or employee housing or housing allowances, whether or not such benefits are part of a bona fide compensation plan in effect at the time specified for the opening of Project bids.
- b. Superintendent labor and clerical labor.
- c. Bond premiums
- d. Insurance in excess of that required under Section 8.8
- e. Utility costs
- f. Work Site office expenses
- g. Home office expenses.
- h. Permit or license costs

**9-1.04 Retention.** The City or its agent may, in accordance with the Contract Documents and applicable law, withhold any payment of monies due or that may become due the Contractor because of:

- a. Defective work not remedied or uncompleted work.
- b. Claims filed or reasonable evidence indicating probable filing of claims.
- c. Failure to properly pay subcontractors or to pay for material or labor.
- d. Reasonable doubt that the Work can be completed for the balance then unpaid.
- e. Damage to another contractor.
- f. Damage to the City.
- g. Damage to a third party.

- h. Delay in the progress of the Work, which, in the City's judgment, is due to the failure of the Contractor to properly expedite the Work.
- i. Liquidated damages or other charges that apply to the Contractor under the Contract.
- j. Any other lawful basis for withholding payment under the Contract.

**9-1.05 Securities in Lieu of Retention.**

- a. In accordance with Public Contract Code Section 22300, except where federal regulations or polices do not permit substitution of securities, the Contractor may substitute securities for any moneys withheld by the City to ensure performance of the Work. At the Contractor's request and expense, securities equivalent to the amount withheld will be deposited with the City, or with a state or federally chartered bank in California as the escrow agent, who will then pay those moneys to the Contractor under the terms of an Escrow for Security Deposit agreement. The Escrow for Security Deposit agreement is provided in the Contract Documents. Upon satisfactory completion of the Work, the securities will be returned to the Contractor.
- b. Alternatively, at the Contractor's request and expense, the City will pay retentions earned directly to the escrow agent. At the Contractor's expense, the Contractor may direct investment of the payments into securities. Upon satisfactory completion of the Work, the Contractor will receive from the escrow agent all securities, interest, and payments received by the escrow agent from the City pursuant to this provision and the terms of the Escrow for Security Deposit agreement. The Contractor will, within 20 days of receipt of payment, pay to each subcontractor the respective amount of interest earned, less costs of retention withheld from each Subcontractor, on monies withheld to ensure the Contractor's performance of the Work.
- c. Securities eligible for investment in accordance with this provision include those listed in Government Code Section 16430, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the City.
- d. The Contractor will be the beneficial owner of any securities substituted for moneys withheld and will receive any interest thereon.

## **SECTION 10 Project Acceptance and Closeout**

**10-1.01 Occupancy.** The City reserves the right to occupy or use any part or parts or the entire of the Work before the Work is fully performed. Subject to applicable law, exercising this right will in no way constitute acceptance of any part of the Work so occupied or used or acceptance of the entire Work, nor will such occupancy or use in any way affect the times when payments will become due the Contractor, nor will such occupancy or use in any way prejudice the City's rights under the Contract, any Contract bonds, or at law or equity. Occupancy or use will not waive the City's rights to assess liquidated damages in accordance with Section 7 after the date of such occupancy or use.

**10-1.02 Work Completion and Final Inspection.** When the Contractor considers the Work is completed, the Contractor will submit written certification to the Engineer specifying that: the Contract Documents have been reviewed; the Work has been inspected for compliance with the Contract Documents; the Work has been completed in accordance with the Contract Documents; and that equipment and systems have been tested in the presence of the City's representative and are operational. The City and/or the City's authorized representatives will make an inspection to verify that the Work is complete and will notify the Contractor in writing of any incomplete or deficient Work. The Contractor will take immediate steps to remedy the stated deficiencies and give notice of correction to the Engineer. Upon receiving a notice of correction, the City or the City's authorized representatives will re-inspect the Work. The Contractor must correct all punch list items within 15 working days after the issuance of the punch list

### **10-1.03 Work Acceptance.**

- a. All finished Work will be subject to inspection and acceptance or rejection by the City, the Engineer, and the Architect or other government agencies having jurisdiction over the Work. Final acceptance of the Work will be at the discretion of the City.
- b. The City will accept the Work in writing only when the Work has been completed to the City's reasonable satisfaction. Progress payments will in no way be construed as acceptance of any part of the Work.
- c. In evaluating the Work, no allowance will be made for deviations from the Technical Specifications, Project Plans or other Contract Documents unless already approved in writing in accordance with the requirements of Section 4, above.
- d. The fact that the Work and materials have been inspected from time to time and that progress payments have been made does not relieve the Contractor of the responsibility of replacing and making good any defective or omitted work or materials in accordance with the requirements of the Contract Documents.

## SECTION 11 Remedies and Disputes

**11-1.01 Failure to Correct Work.** Within ten (10) working days of receiving written notice from the City describing Work that is defective or that is otherwise not in accordance with the requirements of the Contract and/or applicable law and directing that such Work be corrected, the Contractor and/or the Contractor's sureties must give the City written notice of the intent of the Contractor and/or the Contractor's sureties to correct such Work and commence correction of such Work in accordance with the City's notice and the Contract. If the Contractor and/or the Contractor's sureties do not give the City written notice of intent to correct such Work and commence correction of such Work within ten (10) working days of receipt of the City's notice, then the City may correct such work and/or have such work corrected for the account and at the expense of the Contractor and/or its sureties, and the Contractor and/or its sureties will be liable to the City for any resulting excess cost. The City may, in addition to all other remedies that the City may have under the Contract and at law or equity, deduct any such excess cost of completing the Work from amounts that are due or that may become due the contractor.

### 11-1.02 Termination.

- a. In accordance with California Public Contract Code Section 7105, in addition to all other available remedies that the City may have under the Contract, and at law or equity, the City may terminate the Contract:
  1. If the Contractor or any of its subcontractors engaged in the performance of the Work fails to timely perform the Work and/or any of the Contractor's material obligations under the Contract Documents, including but not limited to submission of an acceptable schedule, that have accrued except for due to reasons beyond the control of the Contractor pursuant to the Contract Documents.
  2. If the Contractor is adjudged bankrupt, or if it should make a general assignment for the benefit of creditors, or if a receiver should be appointed on account of its creditors.
  3. If the Contractor or any of the subcontractors engaged in the performance of the Work persistently or repeatedly refuses or fails to supply enough properly skilled workmen or proper materials for the timely completion of the Work.
  4. If the Contractor fails to make prompt payment to subcontractors engaged in the performance of the Work or for material or labor used in the performance of the Work in accordance with the Contract Documents and applicable law.
  5. If the Contractor or any subcontractors engaged in the performance of the Work persistently disregards laws or ordinances applicable to the performance of the Work, or the instructions of the City, the Engineer, the Architect, or other authorized representatives of the City.
  6. For any reason or for no reason, at the City's sole discretion.
- b. If the City intends to terminate the Contractor's control of the Work for any of the reasons specified in Section 11-1.102(a) 1 through 5, above, the City will immediately serve written

notice to the Contractor and its sureties in accordance with the Contract Documents. Notice of the City's intent to terminate the Contract will be given by registered or certified mail and specify the grounds for termination, the required cure and the time by which the cure must be effected. Upon receipt of notice of the City's intent to terminate the Contract for any of the reasons specified in Section 11-1.102(a) 1 through 5, the Contractor will have ten (10) days from receipt of the notice or a longer time specified in the notice to cure its default. If the Contractor does not affect the required cure by the time specified in the notice, the City will issue a written notice of termination to the Contractor and its sureties by registered or certified mail. The notice of termination will specify: that upon receipt of the notice the Contractor's right to perform or complete the Work, including on behalf of the Contractor's sureties, is terminated; that the Contractor's sureties will have the right to take over and complete the Work and perform all of the Contractor's remaining obligations that have accrued under the Contract; and that if the Contractor's sureties do not both give the City written notice of their intention to take over and perform the Contract and commence completion of the Work and performance of all of the Contractor's remaining obligations that have accrued under the Contract within ten (10) days after receipt of notice of termination that the City may declare the Contractor's sureties in default and take over the completion of the Work or have the Work completed for the account and at the expense of the Contractor and its sureties, and the Contractor and its sureties will be liable to the City for any resulting excess cost. The City may, in addition to all other available remedies that the City may have under the Contract Documents and at law or equity, deduct any such excess cost of completing the Work from amounts that are due or that may become due the Contractor.

- c. Upon termination of the Contractor's control of the Work for any of the reasons specified in Section 11-1.102(a) 1 through 5, the Contractor will, if so directed by the City, immediately remove from the Work site any and all materials and personal property belonging to the Contractor which have not been incorporated in the Work and the Contractor and its sureties will be liable upon their bond for all damages caused the City by reason of the Contractor's failure to complete the Work.
- d. Upon termination of the Contractor's control of the Work for any of the reasons specified in Section 11-1.102(a) 1 through 5, above, the City reserves the right to refuse tender of the Contractor by any surety to complete the Work.
- e. If the City completes or has completed any portion of, or the whole of the Work, following termination of the Contractor's control of the Work for any of the reasons specified in Section 11-1.102(a) 1 through 5, above, the City will neither be liable for nor account to the Contractor or the Contractor's sureties in any way for the time within which, or the manner in which such Work is performed, or for any changes made in such Work or for the money expended in satisfying claims and/or suits and/or other obligations in connection with completing the Work. If, following termination of the Contractor's control of the Work for any of the reasons specified in Sections Section 11-1.102(a) 1 through 5, above, the unpaid balance of the Contract Price exceeds the expense of completing the Work, including compensation for additional legal, managerial and administrative services and all other amounts due for the completion of the Work and/or satisfaction of claims of the City and/or others arising out of the Contract and any other charges that apply to the Contractor under the Contract, the difference will be paid to the Contractor. If such expenses of completing the Work exceed the unpaid balance of the Contract Price, the Contractor or its sureties will pay the difference to the City.

- f. If the Contract or Contractor's control of the Work is terminated for any reason, no allowances or compensation will be granted for the loss of any anticipated profit by the Contractor.
- g. In accordance with California Government Code Section 4410, in the event a national emergency occurs, and public work being performed by contract is stopped, directly or indirectly, because of the freezing or diversion of materials, equipment or labor, as the result of an order or a proclamation of the President of the United States, or of an order of any federal authority, and the circumstances or conditions are such that it is impracticable within a reasonable time to proceed with a substantial portion of the work, then the City and the Contractor may, by written agreement, terminate the Contract. In accordance with California Government Code Section 4411, such an agreement will include the terms and conditions of the termination of the contract and provision for the payment of compensation or money, if any, which either party will pay to the other or any other person, under the facts and circumstances in the case. Compensation to the Contractor will be determined on the basis of the reasonable value of the work done, including preparatory work. As an exception to the foregoing, in the case of any fully completed separate item or portion of the Work for which there is a separate contract price, the Contract price will control. The parties may in any other case adopt the Contract price as the reasonable value of the work or any portion of the work done.

### **11-1.03 Disputes.**

- a. In accordance with California Public Contract Code Section 20104.2, the following procedures apply to claims of \$375,000 or less between the Contractor and the City:
  - 1. The claim must 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.
  - 2. For claims of less than fifty thousand dollars (\$50,000), the City will respond in writing to any written claim within 45 days of 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 to the claim the City may have against the Contractor.
  - 3. If additional information is thereafter required, it will be requested and provided pursuant to this subdivision, upon mutual agreement of the City and the Contractor.
  - 4. The City's written response to the claim, as further documented, will be submitted to the Contractor within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.
  - 5. For claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000), the City will respond in writing to all written claims within 60 days of 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 to the claim the City may have against the Contractor.

6. If additional information is thereafter required, it will be requested and provided pursuant to this subdivision, upon mutual agreement of the City and the Contractor.
  7. The City's written response to the claim, as further documented, will be submitted to the Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.
  8. If the Contractor disputes the City's written response, or the City fails to respond within the time prescribed, the Contractor may so notify the City, in writing, either within 15 days of receipt 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 settlement of the issues in dispute. Upon a demand, the City will schedule a meet and confer conference within 30 days for settlement of the dispute.
  9. Following the meet and confer conference, if the claim or any portion remains in dispute, the Contractor may file a claim as provided in 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 will be tolled from the time the Contractor submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.
  10. This section does not apply to tort claims and nothing in this article is intended nor will be construed to change the time periods for filing tort claims or actions specified by 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.
- b. In accordance with California Public Contract Code Section 20104.4, the following procedures apply to civil actions to resolve claims of \$375,000 or less between the City and the Contractor:
1. Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court will submit the matter to non-binding mediation unless waived by mutual stipulation of both parties. The mediation process will provide for the selection within 15 days by both parties of a disinterested third person as mediator, will be commenced within 30 days of the submittal, and will be concluded within 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 15-day period, any party may petition the court to appoint the mediator.
  2. If the matter remains in dispute, the case will 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) will apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

3. Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article will be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators will be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses will 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 will these fees or expenses be paid by state or county funds.
  4. 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 who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment must, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.
  5. The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.
- c. In accordance with California Public Contract Code Section 20104.6:
1. The City will not fail to pay money as to any portion of a claim, which is undisputed except as otherwise provided in the Contract.
  2. In any suit filed under Public Contract Code Section 20104.4 concerning this Contract, the City will pay interest at the legal rate on any arbitration award or judgment. Such interest will accrue from date the suit was filed.

## **SECTION 12 Additional Provisions**

### **12-1.01 Description of Work.**

The Work in general consists of approximately 9,000 feet of 12-inch and 2,000 feet of 4-inch recycled water pipeline, trenchless crossing of Highway 101, construction of a bulk fill station, and other such items of work as are required to complete the Project in accordance with this Contract, the Project Plans and Technical Specifications.

The estimate of the quantities of Work to be done is approximate only, being as a basis for the comparison of bids, and the City does not expressly or by implication agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount or any portion of the work as directed by the Engineer.

Incidental items of construction necessary to complete the Work in a satisfactory and acceptable manner as shown on the Project Plans and as provided for in the Technical Specifications and not specifically referred to in this section, shall be considered part of the Work and will be understood to be furnished by the Contractor.

### **12-1.02 Construction Limitations.**

The Contractor will be expected to conduct his or her operations in a manner; which creates a minimum to the natural vegetation and landscape. Ingress and egress must be via the existing driveways. Care must be exercised to avoid hazards that may cause injury to persons, animals or property either during working hours or after work hours, which will include dust control, backfilling trenches immediately following pipe laying and temporary fencing as required. Excavation made under this Contract must be backfilled before leaving the work for the night.

The Contractor will be responsible for obtaining permission from the property owners for any construction outside of the Work site or easements as shown on the plans. Equipment will be restricted to the immediate area of construction; pipe trenches will be backfilled as soon as possible.

Receptacles for construction residue, including oil, cleaning fluids, and litter, must be covered. Such residues must be disposed of in a proper manner.

Construction activity within the existing right-of-way must be scheduled to minimize traffic inconvenience and safety hazards to motorists, pedestrians and cyclists.

### **12-1.03 Order of Work.**

Order of work must be in accordance with Section 5-1.05, "Order of Work", of the Caltrans Standard Specifications, which section is made a part of this Contract.

### **12-1.04 Storm Water Pollution Prevention.**

The Contractor must perform the Work in compliance with all applicable requirements of the California State Water Resources Control Board pursuant to National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities Order No. 2009-0009-DWQ, NPDES No. CAS000002 ("General Permit") adopted pursuant to regulations adopted by the U.S. Environmental Protection Agency (USEPA) on November 16, 1990 and codified in 40 Code of Federal Regulations Parts 122, 123, 124. The General Permit applies to storm water discharges from construction sites that disturb land equal to or greater than one acre, and to construction activity that results in soil disturbances of less than one acre if the construction activity is part of

a larger common plan of development that encompasses one or more acre of soil disturbance or if there is significant water quality impairment resulting from the activity. The General Permit requirements that may apply to the Contractor's performance of the Work include, but are not limited to:

- a. Development and implementation of a Storm Water Pollution Prevention Plan ("SWPPP") developed by a Qualified SWPPP Developer (QDD) that is designed to address the following objectives:
  - i. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
  - ii. Where not otherwise required to under a Regional Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;
  - iii. Site BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity;
  - iv. Calculations and design details as well as BMP controls for site run-on are complete and correct; and
  - v. Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.
- b. Assess the risk level based on both sediment transport and receiving water risk and implement risk specific requirements including monitoring and, for risk level 2 and 3, development of a Rain Event Action Plan 48 hours prior to any likely precipitation event.
- c. Inspection of all BMPs.

Portions of the Work that may be subject to the General Permit include, but are not limited to clearing, grading, stockpiling and excavation.

Prior to commencing performance of the Work, the Legally Responsible Person (LRP) must obtain coverage under the General Permit. To obtain coverage, the LRP must electronically file Permit Registration Documents to the State Water Board's Storm Water Multi-Application and Report Tracking System (SMARTS) website, prior to commencement of construction activity, including:

- a. Notice of Intent
- b. Risk Assessment
- c. Site Map
- d. SWPPP
- e. Annual Fee
- f. Signed Certification Statement

The SWPPP must include a Work site map. Geometric equations, notes, details, and all data not related to water pollution control work shall be removed to provide clarity. A copy of the Project Plans must be used as a base plan, with the pertinent stage of construction shown as an overlay to accurately reflect Project site conditions at various phases of construction.

The Contractor must revise and update the SWPPP whenever there is a change in construction operations that may affect the site drainage patterns or discharge of pollutants to surface waters, ground waters, or a separate municipal storm sewer system.

Any fines, damages, Work delays or other impacts that result from failure of the Contractor or privities or agents of the Contractor to fully comply with the requirements of the General Permit or to fully implement the SWPPP will be solely the responsibility of the Contractor.

The Contractor must keep a copy of the General Permit, together with updates and revisions, at the Project site and provide copies of the SWPPP at the request of the City.

**12-1.05 Maintaining Traffic and Pedestrian Operations.**

The Contractor must so conduct his or her operations so as to cause the least possible obstruction and inconvenience to public traffic. Unless otherwise approved by the Engineer, all traffic must be permitted to pass through the Work.

Due to the need to accommodate and minimize inconvenience to the public, unless expressly specified or approved in writing by the Engineer, no road closures will be permitted. Public vehicular and pedestrian traffic must be allowed to travel through the Work area with an absolute minimum of interruption or impedance unless otherwise provided for in the Contract or approved in writing by the Engineer. The Contractor must make provisions for the safe passage of pedestrians around the area of Work at all times.

Residents affected by construction must be provided passage and access through the Work area to the maximum extent possible. Where existing driveways occur on the street, the Contractor must make provisions for the trench crossings at these points, either by means of backfill or by temporary bridges acceptable to the Engineer, so that the length of shut-down of any driveway is kept to a minimum. In addition, all driveways must be accessible at the end of each workday, and no driveway or property access may be closed for more than four (4) hours during the workday. Access to driveways, houses, and buildings along the road or street must be as convenient as possible and well maintained, and all temporary crossings must be maintained in good condition. To minimize the need for and complexity of detours, not more than one crossing or street intersection or road may be closed at any one time without the written approval of the Engineer.

The Contractor must provide multiple, advance written notices of closures to all affected property owners in a form approved by the Engineer.

Except as otherwise approved by the Engineer, the stockpiling or storing of material in City streets or right of way shall be prohibited. Where this is unavoidable, all such materials must be piled or stored in a manner that will not obstruct sidewalks, driveways, or pedestrian crossings. Gutters and drainage channels must be kept clear and unobstructed at all times. All such materials shall be stored and handled in a manner that protects City streets, sidewalks, or other facilities from damage.

Where approved in advance by the Engineer, the Contractor must construct and maintain detours for the use of public traffic at his or her own expense. Failure or refusal of the Contractor to construct and maintain detours so approved at the proper time will be a material breach of the Contract subject to any and all remedies available pursuant to the Contract Documents and at law and equity. Such remedies include, but are not limited to, termination pursuant to Section 11.

Throughout performance of the Work the Contractor must construct and adequately maintain suitable and safe crossings over trenches and such detours as are necessary to care for the public and private traffic at all times including Saturdays, Sundays and holidays.

The Contractor will be responsible for keeping all emergency services, including the Healdsburg police and fire departments informed of obstructions to, or detours around any public or private roads caused by reasons of his or her operations.

The Contractor must comply with the State of California, Department of Transportation Manual of warning signs, lights, and devices for use and performance of work within the job site.

The fact that rain or other causes, either within or beyond the control of the Contractor, may force suspension or delay of the Work, shall in no way relieve the Contractor of his or her responsibility of maintaining traffic through the Project and providing local access as specified in this section. The Contractor must, at all times, keep on the job such materials, force and equipment as may be necessary to keep roads, streets and driveways within the Project open to traffic and in good repair and shall expedite the passage of such traffic, using such force and equipment as may be necessary.

Full compensation for conforming to the requirements of this section will be deemed included in the prices paid or the various Contract items of Work and no additional allowances will be made therefore.

#### **12-1.06 Public Safety.**

The Contractor must at all times conduct the Work in accordance with Construction Safety Orders of the Division of Industrial Safety, State of California, to ensure the least possible obstruction to traffic and inconvenience to the general public, and adequate protection of persons and property in the vicinity of the work.

No pedestrian or vehicle access way may be closed to the public without first obtaining permission of the Engineer.

Should the Contractor fail to provide public safety as specified or if, in the opinion of the Engineer, the warning devices furnished by the Contractor are not adequate, the City may place any warning lights or barricades or take any necessary action to protect or warn the public of any dangerous condition connected with the Contractor's operations and the Contractor will be liable to the City for, and the City may deduct from amounts due or that may become due the Contractor under the Contract, all costs incurred including, but not limited to, administrative costs.

Nothing in this section will be construed to impose tort liability on the City or Engineer.

#### **12-1.07 Preconstruction Conference.**

A pre-construction conference will be scheduled, at which time the Contractor must present his or her proposed work schedule in accordance with Section 3-1.08 of the General Provisions, information concerning offsite yards, subcontractors, location of disposal and stock pile areas, and traffic control plans. All such schedules will be subject to the approval of the Engineer and the applicable agencies

#### **12-1.08 Owner Notification.**

The Contractor must notify all property owners and businesses affected by the Work at least 48 hours before Work is to begin. The notice must be in writing in the form of a door hangar, and must indicate the Contractor's name and phone number, type of work, day(s) and time when Work will occur. Notices must be reviewed in advance and approved by the Engineer.

#### **12-1.09 Emergency Service Providers Notifications.**

The Contractor must furnish the name and phone number of the Safety Supervisor appointed in Section 13 to the City Police Department dispatcher for contact in the event of an emergency and shall keep such information updated as required to provide 24-hour phone access.

#### **12-1.10 Clean up.**

Section 4-1.02 of the Caltrans Standard Specifications is made a part of this Contract

Before final inspection of the work, the Contractor must clean the construction site and all ground occupied by him in connection with the work, of all rubbish, excess material, falsework, temporary structures and equipment. All parts of the work shall be left in a neat and presentable condition.

Nothing herein shall require the Contractor to remove warning, regulatory, and guide signs prior to formal acceptance by the Engineer.

**12-1.11 Obstructions.**

Section 15, "Existing Highway Facilities", of the Caltrans Standard Specifications, is made a part of this Contract; except that, references to the following sections of the Standard Specifications are hereby deleted; such sections are not a part of this Contract: 9-1.03, "Force Account Payment," 15-3.03, "Measurement," 15-3.04, "Payment," and 16-1.07, "Adjustment of Lump Sum Item."

Attention is directed to the possible existence of overhead and underground power, telephone, and television cable poles, underground sewer mains and laterals, underground gas mains, and underground water mains and laterals within the area in which construction is to be performed.

Prior to starting work, the Contractor must (a minimum of 2 working days in advance) call Underground Service Alert (USA), toll free, at (800) 642-2444 and provide USA with all necessary data relative to the proposed work. USA will accept calls and process information to participating agencies that have underground facilities in the area between the hours of 7:30 a.m. and 5:00 p.m. daily, except Saturdays, Sundays, and holidays. Between the hours of 5:00 p.m. and 7:30 a.m. calls will be recorded and then processed after 7:30 a.m. For emergency situations, after hours and on Saturdays, Sundays and holidays, the Contractor shall contact the organization owning the affected facility. Upon notification, agencies having facilities in the area of the proposed excavation will mark their locations in the field using USA standard colors and codes to identify the facility.

The Contractor will be required to work around public and private utility facilities and other improvements that are to remain in place within the construction area and he will be held liable to the owners of such facilities or interference with service resulting from his operations.

**12-1.12 Hours of Work.**

Unless otherwise specified herein, all construction activity, except for emergency situations, will be confined to Monday through Friday between the hours of 7:30 a.m. and 6:00 p.m., to minimize nuisances to local residents. Mufflers and/or baffles will be required on all construction equipment to control and minimize noise. The Contractor must comply with all applicable noise regulations in the City's Municipal Code.

Saturday, Sunday, holidays and overtime shall not be regarded as working days. Work shall not be allowed on non-working days without the expressed approval of the Engineer. The Contractor shall make a request for approval in writing with the stipulation (implied or expressed) that the Contractor shall pay for all overtime labor charges at the rate of \$300 per hour per inspector and/or resident engineer. All overtime labor charges shall be deducted from the final payment along with any liquidated damages.

Work necessary for the proper care and protection of work already performed or in case of emergency may be allowed without permission of the Engineer.

### **12-1.13 Dust Control.**

The Contractor must furnish all labor, equipment, and means required and carry out effective measures wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance. The Contractor will be responsible for any damage resulting from any dust originating from the performance of the Work. The use of water resulting in mud on streets, sidewalks, or driveways, will not be permitted as a substitute for sweeping or other methods of dust control. The Contractor may not discharge smoke, dust, or any other air contaminants into the atmosphere in such quantity as will violate the regulations of any legally constituted authority.

Dust control must conform to the provisions in Section 10, "Dust Control", of the Caltrans Standard Specifications, which section is made a part of this Contract, except that references to Section 7 of the Standard Specifications are hereby deleted. Except as otherwise expressly provided in this Contract, Section 7 of the Standard Specifications is not a part of this Contract.

In lieu of the provisions of the second paragraph in Section 10-1.04, "Payment", of the Caltrans Standard Specifications, no separate payment will be made to the Contractor for controlling dust, whether caused by construction traffic or by public traffic only. Full compensation for dust control will be considered as included in the Contract Price and no additional compensation will be allowed therefore.

### **12-1.14 Water For Construction And Dust Control.**

Construction water is available free-of-charge from the recycled water dispensing facilities located at 280 Kinley Road and at 340 Foreman Lane. The Contractor shall apply for a Recycled Water Trucking Permit through the City of Healdsburg and shall meet the requirements of the permitting process. The Contractor shall comply with all permit requirements for the use and handling of recycled water. Construction water shall not be drawn from any other source within the City of Healdsburg.

The Contractor is prohibited from operating gate valves, fire hydrants, pumps or any other components of the City water system. The Contractor must contact the City's utilities staff, a minimum of twenty-four (24) hours in advance, to operate these or any other components on the City water system.

### **12-1.15 Sanitary Provisions.**

The Contractor must maintain such camps, as he or she may establish for the housing and feeding of the laborers, employed by him or her for the Work, in accordance with the status and general health laws of the State of California pertaining to the sanitation of dwelling and camps and in conformity with such rules and regulations pertaining to labor camps, as have been or may hereafter be prescribed by the State Board of Health or by the Commission of Emigration and Housing of California acting in conjunction with said State Board of Health.

### **12-1.16 Protection And Restoration Of Vegetation.**

Trees, lawns, shrubbery and vegetation that are not to be removed must be protected from damage or injury. Existing trees, shrubs, and other plants, that are not to be removed and are injured or damaged by reason of the Contractor's operations, must be replaced by the Contractor in accordance with the requirements in Section 20-4.07, "Replacement", of the Caltrans Standard Specifications. Section 20-4.07 of the Caltrans Standard Specifications is made a part of this Agreement.

When it is necessary to excavate adjacent to existing trees, shrubs, or hedges, the Contractor must use all possible care to avoid injury to the trees, shrubs, or hedges and their roots. No roots

or limbs two inches (2") or larger in diameter may be cut without the express approval of the Engineer.

All roots two inches (2") in diameter and larger left in place must be wrapped with burlap to prevent scarring or excessive drying. When it is necessary to cut limbs and branches of trees to provide clearance for equipment used in construction, the Contractor must repair the damaged areas by properly painting with an emulsified asphalt type seal. All cuts through 1/2" or larger roots and limbs must be hand trimmed and cleanly cut before being repaired.

### **12-2.01 Cultural Resources.**

In accordance with the National Historic Preservation Act of 1966 (U.S.C. 470), the following procedures are implemented to insure historic preservation and fair compensation to the Contractor for delays attendant to the cultural resources investigation. Contractor hereby agrees to comply with these procedures.

### **12-2.02 Surplus Material.**

All material removed or excavated during the course of construction will be surplus. All surplus material will be the property of the Contractor and be disposed of outside the right-of-way, unless the City elects to salvage certain objects that are determined to be of historical interest. The City reserves the right of ownership of all objects that it elects to salvage, and the Contractor must protect such objects from subsequent damage until delivered unto the care of the owner.

### **12-2.03 Historical Finds.**

In the event potential historical, architectural, archeological, or cultural resources (hereinafter called cultural resources) are discovered during subsurface excavations at the site of construction, the following procedures will apply:

1. The Contractor must immediately notify the Engineer and stop any Work which may jeopardize the find pending an investigation of its significance;
2. The Engineer will select a qualified archeologist (such as through the Northwest Information Center at Sonoma State University or other official contact) and wait for an archaeologist to complete an evaluation of significance before continuing Work in that area.
3. The Engineer will supply the Contractor with a "Stop Work Order" directing the Contractor to cease all portions of the Work that the Engineer determines may impact the find. The "Stop Work Order" will be effective until a qualified archaeologist assesses the value of the potential cultural resources. The "Stop Work Order" will contain the following:
  - a. A clear description of the Work to be suspended;
  - b. Any instructions regarding issuance of further orders by the Contractor for materials services;
  - c. Guidance as to action to be taken regarding subcontractors;
  - d. Any direction to the Contractor to minimize costs; and
  - e. Estimated duration of the temporary suspension.
4. If the archaeologist determines the potential find is a bona fide cultural resource, the Engineer may extend the duration of the "Stop Work Order" in writing, and if so the "Stop Work Order" will remain in effect and Work subject to the "Stop Work Order" may not resume work until authorized by the Engineer.

#### **12-2.04 Cultural Resources Defined.**

Possible indicators that a cultural resource has been found include, but are not limited to the following:

1. Prehistoric-era archaeological site indicators: obsidian tools, tool manufacture waste flakes, grinding and other implements, dwelling sites, animal or human bones, fossils, and/or locally darkened soil containing dietary debris such as bone fragments and shellfish remains;
2. Historic-era site indicators: ceramic, glass, and/or metal.

#### **12-2.05 Engineer's Discretion.**

Once possible cultural resources are found at the Work site, the Engineer may use discretion to continue the work, regardless of the cultural resource find, if the Engineer determines that there are overriding considerations such as the instability of the excavation site, that there are weather or other conditions which would preclude leaving the site exposed, or if the site would be unsafe to workers who would retrieve cultural resource items from therein.

## SECTION 13 Safety Rules and Requirements

### 13-1.01 General

- a. Within ten (10) working days following notice of award the Contractor must submit to the City a safety program for the Work site ("Contractor's Safety Program") and provide evidence that the Contractor's safety policies and procedures relevant to the Work.
- b. The Contractor shall insure that its employees and subcontractors, as well as visitors and others brought onto the Work site under the authority of the Contractor, shall, at all times, observe all applicable Local, State and Federal safety requirements as well as the safety rules and requirements contained in this Contract including, but not limited to, the Contractor's Safety Program.
- c. In accordance with generally accepted construction practices and applicable law, the Contractor will be solely and completely responsible for conditions at the Work site, including safety of all persons and property during performance of the Work. This requirement will apply continuously and not be limited to normal working hours. For purposes of California Labor Code Section 6400 and related provisions of law, the Contractor and the Contractor's privities and any other entities engaged in the performance of the Work will be "employers" responsible for furnishing employment and a place of employment that is safe and healthful for all employees of any such entities engaged in the performance of the Work. Neither the City nor its officials, officers, employees, agents, volunteers or consultants will be "employers" pursuant to California Labor Code Section 6400 and related provisions of law with respect to the Contractor, the Contractor's privities or other entities engaged in the performance of the Work.
- d. The Contractor agrees with respect to the Work, and the Work site, the Contractor will be responsible for not creating hazards and for having hazards corrected and/or removed, for taking appropriate, feasible steps to protect the Contractor's employees from such hazards and that the Contractor has instructed and/or will instruct its employees to recognize such hazards and how to avoid the associated dangers.
- e. The Contractor will be solely responsible for the implementation and maintenance of safety programs to ensure that the Work site is maintained and the Work is performed in a safe manner in accordance with the Contract and applicable law. If the Contractor damages City equipment or property, the Contractor shall report the incident to the Engineer on or before the next calendar day and provide such information as necessary for the City to evaluate the damage.
- f. The Contractor shall submit a written request to the Engineer in order to obtain keys or other devices to gain access to City facilities. Keys and other devices shall not be copied or otherwise replicated and shall remain in the possession of the Contractor and its employees or subcontractors at all times and shall be returned to the City when no longer required to complete the Work.
- g. The Contractor must furnish and place proper guards and systems for the prevention of accidents, including, but not limited to, those systems required pursuant to Title 8, Section 1670 et seq. of

the California Code of Regulations concerning safety belts and nets. The Contractor must provide and maintain any other necessary systems or devices required to secure safety of life or property at the Work site in accordance with accepted standards of the industry and applicable law. The Contractor must maintain during all night hours sufficient lights to prevent accident or damage to life or property.

- h. Examination, inspection, investigation, and review by the City and or its employees and representatives, of the Contractor's Safety Plan or the Contractor's performance of the Work will not constitute review or approval of the adequacy of the Contractor's safety measures in, on, or near the Work site and shall not relieve the Contractor of any of the Contractor's obligations under the Contract and applicable law to ensure that the Work site is maintained and the Work is performed in a safe manner.

#### **13-1.02 Safety Supervisor; Hazardous Substances**

- a. The Contractor shall designate an individual who is qualified and authorized to supervise and enforce compliance with the Contractor's Safety Program ("Safety Supervisor"). The Contractor shall notify the Engineer in writing prior to the commencement of the Work of the name and contact information of the Safety Supervisor. The Safety Supervisor shall be either a full-time employee of the Contractor or a contracted safety consultant with experience and/or professional certifications indicating experience in construction safety. The Safety Supervisor shall provide the City, upon request, with weekly safety inspection reports identifying hazards found and corrective actions taken. The Safety Supervisor shall also be responsible for supervising compliance with applicable safety requirements on the Work site and to develop and implement safety training for all job personnel. The City shall have the authority, but not the duty, to require the Contractor replace the Safety Supervisor if the Supervisor's performance is judged by the City to be improper or inadequate.
- b. Prior to beginning the Work, the Contractor shall review the City's Hazard Communication Program. In addition, if the Contractor brings any substance onto City property, other than gasoline or diesel fuel, for which a manufacturer has prepared a Materials Safety Data Sheet (*MSDS*), in quantities greater than 25 pounds, 200 cubic feet, or five gallons; or any substance defined in Cal/OSHA regulations as "acutely hazardous;" or if the Contractor's work activities may expose City employees to any of the substances described above, the Contractor shall first complete and submit to the Engineer a "Report of Use/Storage of Hazardous Substances on City Property" form (*form(s) provided at Project's Pre-Construction meeting*).

#### **13-1.03 Non-Compliance with Safety Rules and Regulations**

- a. In the event the Contractor fails to comply with applicable Local, State and Federal safety requirements, or the safety rules and requirements contained in this Contract including the provisions of the Contractor's Safety Plan, the City reserves the right to (i) notify the Contractor of its failure to comply, and the reasons therefore, and require that the Contractor immediately undertake, at Contractor's own expense, all actions necessary to bring the Contractor and/or the Project into compliance and (ii) exercise the right to suspend all or part of the Work if the Contractor fails or refuses to undertake and complete such corrective action within the time specified in the notice.
- b. No extension of time or additional compensation will be granted as a result of any suspension of the Work and any issuance by the City of any notice or suspension order shall not operate to waive or otherwise diminish the (i) Contractor's obligations under this Contract to provide a safe

Work site or (ii) City's right to pursue or enforce any remedy, power or right under the Contract or otherwise available at law.

**13-1.04 Accidents and Safety Emergencies**

- a. In accidents or emergencies affecting the safety or protection of persons, the Work, the Work site, or property adjacent thereto, the Contractor shall immediately act to prevent threatened damage, injury or loss and notify the Engineer as soon as possible of the facts and circumstances surrounding the emergency including the involvement of any emergency responders (police, fire, medical, etc.).
- b. The City reserves the right to conduct an investigation of the accident or emergency either in conjunction with, or separate of, the Contractor, and the Contractor shall provide the City all access necessary to permit the City to perform a full and complete investigation, the scope of which shall be at the sole discretion of the City.
- c. Within 24 hours of accidents or emergencies involving in-patient hospitalization or a fatality, the Contractor shall provide the Engineer with a completed Contractor's Injury/Fatality Incident Report (*form(s) provided at Project's Pre-Construction meeting*). The Contractor shall also notify the Engineer in writing of any claims brought against the Contractor, or any subcontractor, judicial or otherwise, related to any such injuries and/or fatalities including a copy of such claim(s).

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# **SECTION 14 Special Provisions**

## **14-01 DEMOLITION, SALVAGE AND ABANDONMENT**

### **14.01.1 PART 1 - GENERAL**

#### **SECTION INCLUDES**

- A. Demolition, salvage and abandonment of existing facilities.

#### **REFERENCED SECTIONS**

- A. The following Section is referenced in this Section
  - 1. Section 01330 – Submittals
  - 2. Section 02320 – Trenching

#### **SUBMITTALS**

- A. Comply with Section 01330.
- B. Description of removal procedures for careful removal of materials to be salvaged and the protection of facilities which are to remain undisturbed.
- C. Time schedule for demolition work including start and end dates for each activity. Show demolition in relation to new construction, including any temporary facilities.
- D. Waste Management and Recycling Plan.
- E. Quantitative demolition waste material reports.
- F. Record drawings showing location of capped utilities.

#### **EXISTING CONDITIONS**

- A. Prior to the submittal of Bids, Contractor shall visit the site and inspect all facilities to become familiar with existing conditions, utilities and extent of demolition and recycling required. Existing felled trees on the site are shown schematically on the Drawings. Contractor shall make his own determination of the amount of tree removal by inspection of the site at the mandatory prebid meeting.

#### **REGULATORY REQUIREMENTS**

- A. Dispose of debris in accordance with the requirements of jurisdictional agencies.
- B. Divert demolished material from the landfill in accordance with CalGreen guidelines.
- C. Comply with applicable air quality control regulations.
- D. Obtain and pay for necessary permits for demolition, transportation of debris to disposal site(s) and dust control.
- E. Erect appropriate safety devices to protect the general public, Owner's operations personnel, and workers from the hazards of demolition activities. Install barriers, guard rails and fences, and provide appropriate warning signs.

## **BURNING**

- A. The use of burning at the project site for the disposal of refuse, debris, and wastematerials will not be permitted.

## **14-1.02 – PRODUCTS – Not Used**

## **14-1.03 - EXECUTION**

### **GENERAL**

- A. The Drawings identify the major equipment and facilities to be demolished, salvaged or abandoned. Auxiliary utilities such as water, air, drainage, lubricationoil, electrical wiring, controls, and instrumentation are not necessarily shown. Remove auxiliary utilities, as well as equipment and pipe supports and associated instrumentation devices pertaining to piping or equipment designated to be removed.
- B. Arrange a meeting no less than ten (10) days prior to demolition with the Engineerand other designated representatives to review any salvageable items and discuss Contractor's Waste Management and Recycling Plan.
- C. Pre-demolition Conference: Conduct conference at Project site
  - 1. Review the environmental goals of this Project with Contractors, subcontractors, and waste haulers and make a proactive effort to increaseawareness of these goals among all labor forces on site

### **PROTECTION OF EXISTING FACILITIES**

- A. Before beginning any cutting, trenching, or demolition work, carefully survey the existing work and examine the Contract Documents to determine the extent of theWork.
- B. Take precautions to prevent damage to facilities which are to remain in place or are to be salvaged and be responsible for any damages to these facilities resultingfrom this work. Repair or replace damages to such work to return the facilities to its pre-existing condition at no additional cost to the Owner.

### **DEMOLITION**

- A. Demolish structures and equipment in an orderly and safe manner.
- B. Dispose of material not identified for salvage or re-installation at a new location.
- C. Minimize dust by sprinkling with water.
- D. Backfill excavations caused by demolition in accordance with Section 02320.

### **SALVAGE**

- A. Carefully remove and salvage, for reuse by the Owner, the following items:
  - 1. NONE.

### **BURIED PIPELINES**

- A. Remove as indicated on the Drawings.

## RECYCLING

- A. The Work of this Contract has a goal a minimum of 65% by weight of the solid waste generated in the Work to be diverted from landfill disposal through a combination of re-use and recycling activities.
- B. Contactor Waste Management and Recycling Plan
  - 1. Must be approved prior to the start of work.
  - 2. Submit in the format provided in Form 02221A and include:
    - a. Contractor's name and project identification information
    - b. Procedures to be used
    - c. Materials to be re-used and recycled
    - d. Estimated total quantities of materials generated in Project
    - e. Names and locations of landfills, re-use and recycling facilities/sites
    - f. Tonnage calculations that demonstrate that Contractor will re-use and recycle a minimum of 65% by weight of C&D materials generated in the Work.
- C. Contractor Reuse, Recycling, and Disposal Report
  - 1. Must be submitted as a condition of approval for progress payments. Failure to submit the form and its supporting documentation will render the application for progress payment incomplete.
  - 2. Submit in the format provided in Form 02221B and include:
    - a. Quantity of materials generated in the Work, disposed in Class III Landfills, or diverted from disposal through recycling.
    - b. Disposal or recycling amounts in either in tons or in cubic yards: if scales are available at disposal or recycling facility, report in tons; otherwise, report in cubic yards. Report in other units for salvage items when no tonnage or cubic yard measurement is feasible.
    - c. Locations to which materials are delivered for reuse, salvage, recycling, accepted as daily cover, inert backfill, or disposal in landfills or transfer stations.
    - d. Legible copies of weigh tickets, receipts, or invoices that specifically identify the project generating the material.
- D. Salvage, Re-Use, and Recycling Procedures
  - 1. Identify re-use, salvage, and recycling facilities
  - 2. Develop and implement procedures to re-use, salvage, and recycle demolition materials, based on the Contract Documents, the Contractor's Waste Management and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source-separated recycling, salvage, and/or mixed debris recycling efforts.

3. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility
4. Source-separate new construction debris, excavation and demolition materials including, but not limited to the following types:
  - a. Asphalt
  - b. Concrete, Concrete Block, Concrete Masonry Units (CMU), SlumpStone (Decorative Concrete Block), and Rocks
  - c. Paper: Bond, Newsprint, Cardboard, Paper, Packing Materials, and Packaging
  - d. Paint
  - e. Glass
  - f. Plastics
  - g. Beverage Containers
  - h. Green Materials (i.e. tree trimmings and land clearing debris)
  - i. Metal (ferrous and non-ferrous)
  - j. Soil
  - k. Wood, Clean Dimensional Wood, Pallet Wood
  - l. Other materials as appropriate
5. Develop and implement a program to transport loads of mixed (commingled) demolition materials that cannot be feasibly source-separated to a mixed materials recycling facility whenever available.

#### **DISPOSAL OF DEMOLISHED MATERIALS**

- A. Concrete, site debris, rubbish, and other materials resulting from demolition operations, as well as mechanical and electrical equipment designated to be demolished, shall be the property of the Contractor and shall be legally disposed of at the Contractor's expense.
- B. Legally transport and dispose of materials that cannot be delivered to a source-separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- C. Use a permitted waste hauler or Contractor's trucking services and personnel.
- D. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.
- E. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
- F. Do not burn, bury or otherwise dispose of rubbish and waste materials on project site.

#### **CLEANING**

- A. During and upon completion of the demolition operations, promptly remove unused tools and equipment, surplus materials,

rubbish, debris, and dust and shall leave work areas in a clean condition.

- B. Do not sweep, grade, or flush surplus materials, rubbish, or debris into storm drains, channels, lakes, or streams.

**END OF SECTION**

**SECTION 02221A**  
**CONTRACTOR'S BUILDING DEMOLITION WASTE AND**  
**RECYCLING PLAN**  
*(Submit After Award of Contract and Prior to Start of Work)*

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ( )	Fax: ( )	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Project Period:	From:	TO:

**Reuse, Recycling or Disposal Processes To Be Used**

*Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:*

01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)  
02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)  
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)  
04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green mats)  
05 - Recycling commingled loads of demolition mats at an off site mixed debris recycling center or transfer station  
06 - Recycling material as Alternative Daily Cover at landfills  
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).  
08 - Disposal at a landfill or transfer station.  
09 - Other (please describe) \_\_\_\_\_

**Types of Material To Be Generated**

*Use these codes to indicate the types of material that will be generated on the project*

A = Asphalt      C = Concrete      M = Metals      I = Mixed Inert      G = Green  
Mats      D = Drywall      P/C = Paper/Cardboard      W/C = Wire/Cable      S = Soils (Non Hazardous)  
M/C = Miscellaneous Construction Debris      R = Reuse/Salvage      W = Wood      O = Other  
(describe)

Facilities Used: Provide Name of Facility and Location (City)  
Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period  
Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

**SECTION I - RE-USED/RECYCLED MATERIALS**

*Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.*

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion			0	0	0	0



**SECTION 02221B BUILDING DEMOLITION CONTRACTOR'S  
REUSE, RECYCLING, AND DISPOSAL REPORT**  
(Submit With Each Progress Payment)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ( )	Fax: ( )	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Period Covered:	From:	To:

**Reuse, Recycling or Disposal Processes Used**

*Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that were recycled or disposed in the sections below:*

- 01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
- 02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
- 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
- 04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green mats)
- 05 - Recycling commingled loads of C&D mats at an off site mixed debris recycling center or transfer station
- 06 - Recycling material as Alternative Daily Cover at landfills
- 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
- 08 - Disposal at a landfill or transfer station.
- 09 - Other (please describe) \_\_\_\_\_

**Types of Material Generated**

*Use these codes to indicate the types of material that were generated on the project*

- |   |                     |                  |                          |                |
|---|---------------------|------------------|--------------------------|----------------|
| A = Asphalt                             | C = Concrete        | M = Metals       | I = Mixed Inert          | G = Green Mats |
| D = Drywall                             | P/C=Paper/Cardboard | W/C = Wire/Cable | S= Soils (Non Hazardous) |                |
| M/C = Miscellaneous Construction Debris | R = Reuse/Salvage   | W = Wood         | O = Other (describe)     |                |

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

**SECTION I - RE-USED/RECYCLED MATERIALS**

*Include all recycling activities for source separated or mixed material recycling centers where recycling occurred.*

Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion			0	0	0	0

SECTION 02221B BUILDING DEMOLITION CONTRACTOR'S  
REUSE, RECYCLING, AND DISPOSAL REPORT

Continued

SECTION II - DISPOSED MATERIALS							
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling occurred.</i>							
Type of Material	Type of Activity	Facilities			Total Truck Loads	Total Quantities	
		Used/Location				Tons	Cubic YD
(ex.) D	08	DEF Landfill, Los Angeles			2	35	
b. Total Disposal					0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
				Tons	Cubic Yards	Other Wt.
a. Materials Re-Used and Recycled				0		
b. Materials Disposed				0		
c. Total Materials Generated (a. + b. = c.)				0	0	0
d. Landfill Diversion Rate (Tons Only)*				#DIV/0!		

\* Use tons only to calculate recycling percentages:  $Tons\ Reused/Recycled/Tons\ Generated = \% \text{ Recycled}$

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Section 01151A is a Division 01 General Requirement under CSI MasterFormat 1998 Edition.  
 For CSI MasterFormat 2004 Edition, this Section may be renumbered as follows:  
 Under Division 00, Procurement and Contracting Requirements, Project Forms 00 60 00  
 Use: Section 00 62 22 Construction Waste Diversion Plan

2. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)  
 Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)  
 Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)  
 Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)  
 Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)

Drywall Scrap: .20  
 Wood Scrap: .16

## **Appendices**

- A Caltrans - Encroachment Permit and Rider
- B OSHA Division of Mines, Underground Classification
- C SMART Application for Entry Permit
- D Sonoma County Encroachment Redline Comments, April 2023
- E Geotechnical Data Report, June 2023
- F Geotechnical Design Memorandum, August 2023
- G Public Works Standard Specifications and Details
- H Public Works Details - Water-Misc
- I Public Works Details - Street, Storm Drain, Sewer

# Technical Specifications

# CITY OF HEALDSBURG



December 2023

## DESIGN CERTIFICATION

The Technical Specifications contained herein have been prepared by, or under the responsible charge of, the following registered person(s):

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12/20/2023



12/20/2023

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**SECTION 01110**  
**SUMMARY OF WORK**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. General description of the Project and the Work to be performed by the Contractor.

1.02 WORK COVERED BY CONTRACT

- A. The Work covered under this Contract will be performed along public right of ways and within easements on private property located within the County of Sonoma and the City of Healdsburg. The project location is indicated on the Drawings.
- B. The Work to be performed by the Contractor generally includes:
  - 1. Furnishing all labor, superintendence, materials, power, water, tools, equipment and services required by the Contract Documents or required to complete the Work.
  - 2. Coordinate work of all trades.
  - 3. Furnishing and installing meters.
  - 4. Furnishing and installing miscellaneous items incidental to or necessary for completion of the Work, whether these items are specifically indicated in the Contract Documents or not.
- C. The Work consists of construction of the following items:
  - 1. Installing 12-inch and 4-inch Recycled Water Main
  - 2. Installing Recycled Water Meter Boxes and Services
  - 3. Installing a trenchless crossing beneath US Highway 101
  - 4. Connecting to existing recycled water mains as shown on plans
  - 5. Installing cross connection control stations
  - 6. Installing bulk fill station
- D. Owner-Furnished Equipment:
  - 1. None.

1.03 OTHER CONTRACTS

- A. Construction of portions of the recycled water pipeline may coincide with construction activities by other contractors and agencies. Coordination with the contractors undertaking related work or un-related work within the project work areas is the responsibility of the Contractor.

#### 1.04 SPECIFICATION LANGUAGE

- A. Specifications may be written in the imperative mood in streamlined form in accordance with practices and principals of the Construction Specifications Institute.
- B. Imperative language is directed to the Contractor unless specifically noted otherwise.
- C. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

#### 1.05 REGULATORY REQUIREMENTS

- A. Comply with all Federal, State, and local laws, regulations, codes, and ordinance applicable to the work.
- B. References in the Contract Documents to local codes shall mean those of City of Healdsburg and the County of Sonoma.
- C. Other standards and codes that apply to the work are designated in the Specifications.

#### 1.06 ACCESS BY GOVERNMENT OFFICIALS

- A. Authorized representatives of governmental agencies shall have access to the work area at all times. Provide proper facilities for access and inspection.

#### 1.07 PROTECTION OF PUBLIC AND PRIVATE PROPERTY

- A. Pipeline construction will encounter numerous existing features of various types, such as fences, drain culverts, irrigation facilities, roadside drainage facilities, mailboxes, signs, private and public driveways, curbs, asphalt pavement, buildings, utility poles, guy wires and other surface structures. Contractor shall protect existing features of this nature and all features affected by construction operations shall be restored to their original condition.
- B. To the greatest extent possible, remove existing features without damaging the materials and re-use the material to place back in the original condition. When existing features are damaged during removal, install new materials of similar type, appearance and function, at no additional cost to the Owner.
- C. Contractor shall be responsible for all damage to streets, roads, driveways, highways, shoulders, ditches, embankments, culverts, bridges, and other public or private property, regardless of location or character, that may be caused by transporting equipment, materials, or workers to or from the work or any part or site thereof, whether by Contractor or Contractor’s subcontractors or suppliers.
- D. Make satisfactory and acceptable arrangements with the Owner of, or the agency or authority having jurisdiction over, any damaged property concerning its repair, replacement, or payment of costs incurred in connection with the damage.
- E. Keep fire hydrants and water control valves free from obstruction and available for use at all times.

**END OF SECTION**

**SECTION 01112**  
**SITE CONDITIONS**

**PART 1 - GENERAL**

1.01 RELATIONSHIP WITH EXISTING FACILITIES

- A. The City of Healdsburg owns and operates water, sanitary sewer, storm drain, electrical facilities and recycled water facilities located within the City boundaries. Gas, telephone, cable communications and other utilities are owned and operated by private entities. The Work under this project shall not interface with these existing facilities.
- B. Owner's personnel will be responsible for operating and maintaining their existing facilities throughout the execution of this Contract.
- C. Take particular care to avoid clutter and debris within the work areas. This includes staging areas along the pipeline alignment.
- D. Limit operations, storage of equipment and materials, and parking of employees for the bore and jack installation to the areas designated on the Drawings.
- E. Except for allowable out-of-service periods as specified, the Contractor shall be responsible for maintaining in operation during construction all sanitary and storm sewers, service laterals, catch basins, manholes, and related facilities. Provide all temporary pumps and piping required to keep facilities in operation throughout the construction period. No existing sanitary or storm sewer shall be taken out of service without the written permission of the Engineer.

1.02 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE

- A. Notify owners of existing utilities prior to the performance of work in the vicinity of their facilities. Provide notification at least two business days in advance of excavation, the date and location of the excavation to be undertaken.
- B. Particular attention shall be given to PG&E's high pressure gas pipelines and City of Santa Rosa's 48-inch diameter Geysers Recharge Pipeline when working in vicinity of their facilities. In addition, the concrete encased AT&T conduit near the bore pit for the Highway 101 crossing shall require particular attention.
- C. Do not begin excavation until receiving a written notification from operators of underground facilities and utility operators that they have:
  - 1. Marked the locatable underground utilities; or
  - 2. Provided a description of underground utilities in the area of the proposed excavation that cannot be located; or
  - 3. Provided notification that no utilities exist within the area of the proposed excavation.
- D. Once underground utilities have been marked, maintain marks during the course of the work.

- E. Where the Contractor's operations could cause damage or inconvenience to existing telephone, power, gas, water, sewer, or irrigation systems, make arrangements necessary for the protection and sustained operation of these utilities and services. If temporary disruption is necessary to complete the work, make arrangements with the owner of the utility prior to service cutoff and also notify the Engineer.
- F. The Contractor is solely and directly responsible to the Owners of utilities, property, fences, and other existing appurtenances for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage that may result from the construction operations under this Contract.
- G. Neither the Owner nor its officers or agents shall be responsible to the Contractor or the Contractor's subcontractors for damages as a result of the Contractor's failure to protect utilities encountered in the work.
- H. Replace, at Contractors expense, any and all existing utilities or structures damaged during construction, unless otherwise provided for in these Contract Documents.

#### 1.03 EXISTING UTILITIES

- A. Existing utilities are shown on the drawings. The type, location, size and depth of existing underground utilities shown on the Drawings were obtained from sources of varying reliability. Efforts have been made to locate and delineate all known underground facilities; however, the Engineer cannot assume responsibility for the completeness and/or accuracy of the delineation of underground facilities whether shown on the Drawings or not, nor for the existence of other buried objects and/or facilities which may be encountered but are not shown on the Drawings.
- B. Connecting to Existing Facilities: Expose all underground facilities that are to be connected to or that might be affected by the construction of the proposed improvements for verification of location and elevation prior to ordering pipe.

#### 1.04 FIELD RELOCATION

- A. During the progress of construction, minor relocations of the work may be necessary. If field conditions are encountered that will prevent construction as shown, notify the Engineer before continuing with the work. The Engineer may make minor field revisions as necessary to resolve the field condition without change in the Contract Price. If the Contractor fails to notify the Engineer when such field conditions are encountered, and proceeds with the work despite the interference, it shall be at the Contractor's own risk.

**END OF SECTION**

**SECTION 01140**  
**WORK SEQUENCE AND CONSTRAINTS**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Schedule requirements, construction constraints, and a suggested Work sequence for specific elements of the Project.

1.02 REFERENCED SECTIONS

- A. The following Section is reference in this Section
  - 1. Section 01999 – Reference Forms

1.03 GENERAL SEQUENCING REQUIREMENTS

- A. The sequencing requirements and construction constraints described are critical elements of the Work and are presented to underscore the importance of proper management, planning, scheduling, coordination, and execution of the Work.
- B. Sequencing requirements and construction constraints have been defined in this Section for only certain structures, facilities, and elements of the Work. All work, whether or not addressed in this Section, shall be governed by applicable specified requirements. If additional shutdown constraints are necessary to allow implementation of Contractor's construction procedures and schedule, the Engineer will establish such constraints.
- C. Contractor's Construction Schedule:
  - 1. Clearly illustrate the proposed sequence of construction.
  - 2. Conform to the sequencing requirements and limitations specified in this Section.
  - 3. Modify or adapt the suggested sequencing as necessary to complete the project provided all environmental and service continuity requirements are met.

1.04 OPERATIONAL CONTINUITY

- A. Coordinate the Work to minimize interference and interruption of the normal operation of the Owner's existing facilities through proper planning and by making temporary connections.
- B. Except for allowable out-of-service periods as specified, maintain operation of all existing facilities.
  - 1. Notify the Engineer in writing 14 days in advance of the time it is necessary to take utilities out of service.
  - 2. Notify public agencies and private utility companies when service to customers will be temporarily interrupted to perform the Work and coordinate shutdowns with these agencies.

## 1.05 PERMIT VIOLATIONS

- A. Construction of the Work under this Contract must be undertaken in compliance with the terms and conditions of various permits that shall be obtained for this project. These include, but are not limited to:
  - 1. California Department of Transportation (Caltrans)
  - 2. City of Healdsburg Encroachment Permit
  - 3. Sonoma County Encroachment Permit
- B. In the event NPDES permit violations or spills are caused or, in the Owner's opinion, will be caused by the Contractor's operations, the Owner shall be entitled to immediately employ others to stop the violations or potential spills without giving written notice to the Contractor. All costs incurred by the Owner to stop or prevent permit violations shall be paid by the Contractor.
- C. Under no circumstances shall recycled water be discharged, bypassed or spilled to creeks, drainage ditches, or other waterways; storm drain systems; or the ground surface. In the event accidental discharge or bypassing is caused by the Contractor's operations, the Owner shall immediately be entitled to employ others to stop the bypassing without giving written notice to the Contractor. All costs incurred by the Owner to stop or prevent the bypass shall be paid by the Contractor.
- D. Penalties imposed on and costs incurred by the Owner as a result of violations caused by the actions of the Contractor, his employees, or subcontractors, shall be borne in full by the Contractor, including legal fees and other expenses to the Owner resulting directly or indirectly from Contractor's actions.

## 1.06 ACCESS

- A. For the work located within the public right-of-way, the Contractor shall maintain public access in conformance with the encroachment permits and Contractor prepared traffic control plans.
- B. For the work located within private properties, the Contractor shall coordinate access with the Engineer and individual property owner's representative.

## 1.07 WORK AFFECTING PRIVATE PROPERTY

- A. It is essential that the Contractor carefully coordinate the work with private landowners who will be affected by the construction.
- B. Prior to beginning work within the Oak Mound Cemetery easement, the Contractor shall meet with the landowner to discuss the work that will be undertaken on their private land. Contractor shall be prepared to discuss the following topics:
  - 1. Sequence and schedule of the work.
  - 2. Areas which will be affected by the work.
  - 3. Points of access onto the property.
  - 4. Vehicle travel routes.
  - 5. Storage of materials.

6. Other construction related issues that affect the private landowner.
- C. Contractor shall coordinate the meeting date, time and place with the Engineer and the Oak Mound Cemetery representative.
- D. The Oak Mound Cemetery may conduct an interment ceremony within minimal notice. If such event were to occur while the Contractor is actively working within the cemetery, the Engineer will notify the Contractor to vacate the site during the ceremony. The Contractor will be entitled to compensation for the number of work hours that they are on stand-by based on the unit price in the bid sheet.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.01 WORK COORDINATION**

- A. Schedule and coordinate the overall Work and construction operations, including the work of subcontractors and the timely provision of products and supplies.
- B. Perform Work in an orderly and logical sequence. Individual specification Sections may identify specific requirements that are related to Work sequence. These types of constraints are not repeated in this Section but shall be followed by the Contractor.

### **3.02 WORK CONSTRAINTS**

- A. Work Hours
  1. Except as otherwise required for the safety or protection of persons and except as otherwise stated in the Contract Documents, Work may only be performed Monday through Friday during the hours of 7:30 am and 6:00 pm. Contractor will not perform Work on a Saturday, Sunday or any legal holiday defined by the City of Healdsburg without written consent from the Engineer. If work is performed outside of defined work days and hours the overtime cost of the inspector will be the sole responsibility of the contractor.
  2. Legal holidays are defined as:
    - a. New Year's Day on January 1.
    - b. Martin Luther King Jr. Day on the third Monday in January.
    - c. President's Day on the third Monday in February.
    - d. Memorial Day on the last Monday in May.
    - e. Juneteenth on June 19.
    - f. Independence Day on July 4.
    - g. Labor Day on the first Monday in September.
    - h. Veteran's Day on November 11.
    - i. Thanksgiving Day on the fourth Thursday in November and the Day after Thanksgiving Day.
    - j. Christmas Eve Day on December 24.
    - k. Christmas Day on December 25.

- I. When a holiday falls on Sunday, the following Monday is recognized as the legal holiday. When a holiday falls on a Saturday, the preceding Friday is recognized as the legal holiday.

### 3.03 SUGGESTED WORK SEQUENCE

- A. The following work sequence is one suggested means of constructing the project, and shall be followed in general unless another suitable method of completing the work is developed by the Contractor and approved by the Owner. This suggested work sequence is general in nature and does not include all work activities required by this Contract for completion of the work. The suggested work sequence shall be coordinated with the requirements of other specification Sections and the Drawings in order to complete the Work in a timely and satisfactory manner.
- B. Suggested Work Sequence
  1. Construct recycled water pipeline by open trench from near the point of connection in Kinley Drive to the 12-inch gate valve at Station 46+24.
  2. Excavate and install shoring for the US Highway 101 trenchless crossing.
  3. Perform trenchless crossing beneath US Highway 101.
  4. Install Bulk Fill Station along Headsburg Avenue.
  5. Flush and Pressure test recycled water main using city recycled water.
  6. Connect to existing recycled water pipeline in Kinley Drive.
  7. Cap pave Kinley Drive, Kennedy Lane and S University Street.
  8. Fill annular space between casing pipe and carrier pipe within SMART right-of-way, remove caps and pressure test pipe segment.
  9. Construct recycled water pipeline by open trench from the 12-inch gate valve at Station 46+24 to Station 46+33 and connect.
  10. Construct recycled water pipeline by open trench from near Station 48+35 to 12-inch tee at Station 80+09.
  11. Pressure test recycled water main using City recycled water.
  12. Cap pave First Street.
  13. Construct recycled water pipeline by open trench from 12-inch tee at Station 80+09 in Piper Street to the end of line service at Station 89+58.
  14. Construct recycled water pipeline by open trench from 12-inch tee at Station 20+00 in Piper Street to the service at Station 41+02.
  15. Construct recycled water meters and service connections.
  16. Flush and Pressure test recycled water mains using City recycled water.
  17. Connect to 12-inch tee in Piper Street and First Street intersection.
  18. Cap pave Piper Street, Cemetery Lane and University Street.

**END OF SECTION**

**SECTION 01200**  
**MEASUREMENT AND PAYMENT**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Methods of measurement and payment for specific items of Work under this Contract. Refer also to General Conditions for administrative aspects of payments by the Owner to the Contractor.

1.02 BID COMPONENTS AND PAYMENT

- A. The Bid Form is comprised of the following components:
  - 1. Lump Sum Work
  - 2. Allowances
  - 3. Unit Price Work
- B. Contractor's cost for "Lump Sum Work" shall cover all Work indicated by the Contract Documents with the exception of cash allowances and specific items of work that are to be paid on a Unit Price basis as indicated on the Bid Form. Lump Sum Work will be paid for on a progress payment basis in accordance with the provisions of the General Conditions.
- C. "Unit Price Work" is Work indicated on the Drawings or specified. The price of each unit of Work is to be defined by the Bidder in the Unit Price Bid Schedule in the Bid Form and shall include all materials, labor, equipment, and incidentals required to complete each Work Item. When actual Work differs from the basis of the Work Item, costs shall be adjusted on a pro-rata basis or other method suited for the particular condition. Work Items established for this Work have been identified on the Bid Form and are described in Paragraph 1.03.

1.03 BID ITEM DESCRIPTIONS

- A. Base and Alternate bid items are presented to indicate major categories of the work for purposes of comparative bid analyses and payment breakdown for monthly progress payments. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in their pricing all materials, labor, and equipment necessary to complete each Bid Item (work phase) as shown and specified in the Contract Documents and as described below, and no additional compensation will be allowed.
- B. MOBILIZATION AND DEMOBILIZATION (BASE BID ITEM NO. 1)
  - 1. Measurement and payment for MOBILIZATION AND DEMOBILIZATION shall be on a Lump Sum basis and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
    - a. Obtaining all bonds and required insurance.
    - b. Obtaining required permits, licenses, agreements and certifications.

- c. Apply for, obtain, and comply with encroachment permits from City of Healdsburg, Sonoma County and Caltrans.
- d. Moving onto the site of all equipment, materials and staff including set up of Contractor's construction office, staging and storage area/yard.
- e. Furnishing and erecting all needed construction facilities, fencing, project signage, and project security.
- f. Perform and submit pre-construction and post-construction photographs and video recording of surface features.
- g. All work as required for the proper performance and completion of the project, including progress schedules and reports, contract meetings, and record drawings.
- h. Base Bid Item 1 shall not exceed 8 percent (8%) of the total bid price. If the amount for Base Bid Item 1 is less than or equal to 6 percent (6%) of the total bid price, seventy-five percent (75%) of the bid item will be paid after mobilization to the construction site, and the remaining twenty-five percent (25%) will be paid after demobilization with the final Progress Payment.
- i. In the event that the Contractor writes in a Mobilization/Demobilization price greater than eight percent (8%) of the total bid price on their Bid Sheet found in the Proposal, the Owner will pay up to 6 percent (6%) of the total bid price after mobilization, with the balance paid after demobilization with the final Progress Payment.
- j. Contractor may apply for payment of mobilization on a percent complete basis as the items included in the Mobilization are being completed.

C. TRAFFIC CONTROL (BASE BID ITEM NO. 2)

- 1. Measurement and payment for TRAFFIC CONTROL shall be on a Lump Sum basis, with partial payments made at the same percentage as total project completion, and shall include furnishing all labor, materials, tools, equipment and incidentals including, but not limited to, the following:
  - a. All submittals.
  - b. Furnishing detailed, engineered traffic control plans for approval by the City of Healdsburg and Sonoma County as required for the open trench and trenchless construction.
  - c. Placing, moving, removing, storing, and maintaining No-Parking signs, barricades, lighted arrow boards, temporary signs, two (2) changeable message signs per closure, temporary traffic signals, and flaggers.
  - d. Establishing and maintaining detours.
  - e. Loading, hauling, removing, covering, and uncovering construction signs.
  - f. Lighting, pedestrian and traffic ramps.
  - g. Temporary striping, k-rails, and pavement markers.
  - h. Traffic plates as necessary.
  - i. All incidentals necessary for worker, pedestrian, bicycle, and traffic protection.

- j. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes and permits, and no additional compensation will be allowed.

D. STORM WATER POLLUTION PREVENTION (BASE BID ITEM NO. 3)

- 1. Measurement and payment for STORM WATER POLLUTION PREVENTION shall be on a Lump Sum basis with partial payments made at the same percentage as total project completion, and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
  - a. Preparing and submitting a Storm Water Pollution Prevention Plan (SWPPP) including all Permit Registration Documents (PRDs) necessary for the City to file Notice of Intent (NOI).
  - b. Updating the SWPPP as necessary during construction.
  - c. Providing information necessary for the City to file Annual Report and Notice of Termination.
  - d. Participation in storm water construction inspections.
  - e. Use of best management practices during construction to prevent construction related pollutants from entering the storm drain system.
  - f. Maintenance of storm water pollution prevention measures.
  - g. Removal and disposal of storm water pollution measures after completion of work.
  - h. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

E. SHEETING, SHORING AND BRACING OTHER THAN FOR TRENCHLESS JACKING AND RECEIVING PITS (BASE BID ITEM NO. 4)

- 1. Measurement and payment for SHEETING SHORING AND BRACING shall be on a Lump Sum basis with partial payments made at the same percentage as total project completion, and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
  - a. All submittals.
  - b. Design, installation and removal of sheeting, shoring, and bracing speed shores, plywood, steel plates, and trench boxes.
  - c. Removal of sheeting and shoring where required.
  - d. Other excavation supports in place necessary to complete all work under the Contract in conformance with Federal and California Safety and Health Standards, Sections 6700-6708 of the Labor Code and these Specifications.
  - e. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

F. DEWATERING (BASE BID ITEM NO. 5)

1. Measurement and payment for DEWATERING shall be on a Lump Sum basis with partial payments made at the same percentage as total project completion, and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
  - a. All submittals.
  - b. Obtaining and complying with permits for the installation and abandonment of extraction wells, including paying all fees.
  - c. Designing, installing, moving, and removing dewatering system including wells, pumps, piping, settling basins and other equipment necessary for a complete dewatering system as needed to manage water and complete the contract work according to these specifications, and all related codes and requirements.
  - d. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.
  
- G. INSTALL 4-INCH AND 12-INCH C900 PVC BY OPEN CUT (BASE BID ITEM NOS. 6, 7, 8, 9, 10 AND 11)
  1. Measurement and payment for INSTALL 4-INCH AND 12-INCH C900 PVC BY OPEN CUT shall be on a linear foot basis and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
    - a. All submittals.
    - b. Surveying.
    - c. Potholing, probing, locating, and protecting other utilities.
    - d. Saw cutting, grinding, surface demolition and removal of asphalt.
    - e. Trenching, spoil handling, and protection of all existing utilities and service laterals within trench.
    - f. Furnishing and installing polyvinyl chloride pipe, restrained as noted on the plans, of stated diameter and footage, with all required fittings, and appurtenances.
    - g. Removal of existing pipe cap and blow-offs, drain existing pipe, and connections to existing pipe.
    - h. Furnishing and installing warning tape.
    - i. Mechanical restraint systems and thrust blocks.
    - j. Connecting rods.
    - k. Preparing and compacting pipe sub-base; furnishing, placing and compacting pipe bedding; furnishing, placing and compacting trench backfill.
    - l. Restoring landscape and ground cover, resetting valve boxes and monuments, and other surface features disturbed by the work and cleaning.
    - m. Daily cleanup and dust control.
    - n. Geotechnical testing.



- d. Saw cutting, grinding, surface demolition and removal of concrete and asphalt.
- e. Trenching, spoil handling, and protection of all existing utilities and service laterals within trench.
- f. Furnishing and installing gate valves including block, riser, and box.
- g. Furnishing and installing warning tape.
- h. Mechanical restraint systems and thrust blocks.
- i. Preparing and compacting sub-base; furnishing, placing and compacting bedding; furnishing, placing and compacting trench backfill.
- j. Furnishing, placing, and compacting surface restoration, including driveways, sidewalks, curbs, gutters, median, accessibility ramps, and adjusting structures to finish grade.
- k. Geotechnical testing.
- l. Daily cleanup and dust control.
- m. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

J. INSTALL BULK FILL STATION (BASE BID ITEM NO. 20)

- 1. Measurement and payment for BULK FILL STATION shall be on a Lump Sum basis with partial payments made baes on the schedule of values, and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
  - a. All submittals.
  - b. Surveying.
  - c. Potholing, probing, locating, and protecting other utilities.
  - d. Saw cutting, grinding, surface demolition and removal of concrete and asphalt.
  - e. Trenching, spoil handling, and protection of all existing utilities.
  - f. Furnishing and installing concrete pads, piping and appurtenances, labels and tags, blocking and bracing.
  - g. Furnishing and installing power supply facilities including two 4-inch conduits with pull ropes, ground rod, hand hole, disconnect switch and coordination with City Electric Department.
  - h. Furnishing and installing bulk fill station.
  - i. Furnishing and installing valves, valve risers and boxes.
  - j. Furnishing and installing tracer wire and warning tape.
  - k. Furnishing and installing reinforced concrete pads.
  - l. Mechanical restraint systems and thrust blocks.
  - m. Testing electrical and radio communications.
  - n. Preparing and compacting pipe subbase; furnishing, placing and compacting pipe bedding; furnishing, placing and compacting backfill.

- o. Furnishing, placing, and compacting surface restoration, including sidewalks, pavement, driveways, curbs, gutters, median, and adjusting structures to finish grade.
- p. Restoring landscape and ground cover, resetting valve boxes and monuments, and other surface features disturbed by the work and cleaning.
- q. Geotechnical testing.
- r. Daily cleanup, dust control, testing, and all incidentals required by these Specifications and Drawings.
- s. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

K. JACKING PIT AND RECEIVING PIT (BASE BID ITEM NOS. 21 AND 22)

- 1. Measurement and payment for JACKING PIT (BASE BID ITEM NO. 21) AND RECEIVING PIT (BASE BID ITEM NO. 22) shall be on a Lump Sum basis with seventy-five percent paid after the bore and jack of the casing pipe commences and remainder after the site has been restored to Caltrans and the Engineer's satisfaction, and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
  - a. All work required by Specification Section 02260.
  - b. All submittals.
  - c. Preparation of the work area, including site clearing.
  - d. Tree removal and trimming.
  - e. Potholing, probing, locating, and protecting existing utilities.
  - f. Surveying.
  - g. Saw cutting, grinding, surface demolition and removal of concrete and asphalt.
  - h. Excavating and spoil handling.
  - i. Design, procurement, installation, and removal of sheeting, shoring, and bracing for pit construction.
  - j. Pit invert preparation.
  - k. Installation of safety and monitoring equipment.
  - l. Daily site cleaning, lighting, ventilation, temporary fencing and barriers, power, dust control, and noise and vibration control and monitoring.
  - m. Grouting and stabilizing earth adjacent to the pit as required to meet pit performance requirements.
  - n. Furnishing, placing and compacting pit backfill.
  - o. Surface restoration of all public and private improvements including repair or replacing curb and gutter, drainage installations, pre-construction surface drainage flow paths, concrete paving, temporary and permanent paving, and pavement markers and striping.
  - p. Testing quality control, and field inspections.

- q. Geotechnical testing.
  - r. Furnishing and installing thrust blocks for carrier pipe.
  - s. Restoring landscape and ground cover, resetting monuments, fences and guard rails, and other surface features disturbed within the work area, and cleaning.
  - t. All incidentals required by the Specifications and Drawings.
  - u. All other work and procedures necessary to comply with Federal and California Safety and Health Standards, Sections 6700-6708 of the Labor Code, the Cal/OSHA Tunnel Classification, Caltrans Encroachment Permit, and these Specifications.
2. Dewatering will be paid for under separate bid item.
- L. INSTALL BORE AND JACK CASING WITH CARRIER PIPE (BASE BID ITEM NO. 23)
- 1. Measurement and payment for BORE AND JACK CASING WITH CARRIER PIPE shall be on a Linear Foot basis, measured by length of installed casing pipe by Horizontal Auger Boring, and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
    - a. All work required by Specification Sections 02401, 02436, and 02446.
    - b. All work required by Specification Sections 02449, 03600, 15145, and 15996 as it pertains to installation of the carrier pipe within trenchless casing pipe.
    - c. All submittals.
    - d. Surveying.
    - e. Excavation and spoil handling.
    - f. Installation of safety and monitoring equipment in pits.
    - g. Furnishing and installing steel casing.
    - h. Furnishing and installing contact grouting.
    - i. Furnishing and installing carrier pipe supports.
    - j. Preparation of the casing pipe for installation of carrier pipe.
    - k. Furnish and install carrier pipe within casing on carrier pipe supports.
    - l. Filling, testing, inspecting and flushing the pipe system.
    - m. Furnishing and installing backfill grout in annular space between the carrier pipe and casing pipe.
    - n. Daily cleanup, dust control, quality control, testing, and all incidentals required by these Specifications and Drawings.
    - o. All other work and procedures necessary to comply with Federal and California Safety and Health Standards, Sections 6700-6708 of the Labor Code, Cal/OSHA Tunnel Classification, Caltrans Encroachment Permit, all other applicable codes and regulations, and these Specifications. No additional compensation will be allowed.
- M. 1-INCH COMBINATION AIR VALVE ASSEMBLY (BASE BID ITEM NO. 24)
- 1. Measurement and payment for 1-INCH COMBINATION AIR VALVE ASSEMBLY shall be per each valve assembly installed and includes furnishing all labor,

materials, tools, equipment, and incidentals including, but not limited to, the following:

- a. All submittals.
- b. Surveying.
- c. Potholing, probing, locating, and protecting existing utilities.
- d. Saw cutting, grinding, surface demolition and removal of concrete and asphalt.
- e. Trenching, spoil handling, and protection of all existing utilities.
- f. Furnishing and installing combination air valve assembly including air release valve, box enclosure, pedestal cabinet, suction screen, drain rock, piping and appurtenances, labels and tags, blocking and bracing.
- g. Furnishing and installing tee and valve or tapping saddle and corporation stop, pipe, and valve.
- h. Tapping pipe.
- i. Furnishing and installing tracer wire and warning tape.
- j. Mechanical restraint systems and thrust blocks.
- k. Testing and inspection.
- l. Geotechnical testing.
- m. Preparing and compacting pipe sub-base; furnishing, placing and compacting pipe bedding; furnishing, placing and compacting backfill.
- n. Furnishing, placing, and compacting surface restoration, including sidewalks, pavement, driveways, curbs, gutters, median, and adjusting structures to finish grade.
- o. Restoring landscape and ground cover, resetting valve boxes and monuments, fences, and other surface features disturbed by the work and cleaning.
- p. Daily cleanup, dust control, testing, and all incidentals required by these Specifications and City Standard Detail WL 15.
- q. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

**N. BLOW OFF ASSEMBLY (BASE BID ITEM NO. 25)**

1. Measurement and payment for BLOW OFF ASSEMBLY shall be per each blow off installed and shall include furnishing all labor, materials, tools, equipment, incidentals, demolition, restoration, and for doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.
  - a. All Submittals.
  - b. Surveying.
  - c. Potholing, probing, locating, and protecting existing utilities.
  - d. Saw cutting, grinding, surface demolition and removal of concrete and asphalt.

- e. Excavation, spoil handling, and protection of all existing utilities.
- f. Furnishing and installing tee, gate valve including block, riser, box, and valve nut extension.
- g. Furnishing and installing pipe, riser, concrete collar, and box.
- h. Furnishing, placing and compacting backfill.
- i. Furnishing, placing, and compacting surface restoration, including sidewalks, pavement, driveways, curbs, gutters, median, and adjusting structures to finish grade.
- j. Restoring landscape and ground cover, resetting valve boxes and monuments, replacing fences, and other surface features disturbed by the work and cleaning.
- k. Testing and inspection.
- l. Geotechnical testing.
- m. Daily cleanup, dust control, testing, and all incidentals required by these Specifications and City Standard Detail WL 14.
- n. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

O. INSTALL BACKFLOW PREVENTER (BASE BID ITEM NO. 26)

- 1. Measurement and payment for BACKFLOW PREVENTOR shall be per each backflow preventor installed and shall include furnishing all labor, materials, tools, equipment, incidentals, demolition, off-haul, restoration, and for doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.
  - a. All Submittals.
  - b. Surveying.
  - c. Potholing, probing, locating, and protecting existing utilities.
  - d. Saw cutting, grinding, surface demolition and removal of concrete.
  - e. Excavation, spoil handling, and protection of all existing utilities.
  - f. Furnishing and installing backflow preventer, ball valves, pipe unions, threaded bushings, bends and other fittings.
  - g. Furnishing, placing and compacting backfill.
  - h. Furnishing, placing, and compacting surface restoration, including sidewalks, pavement, driveways, curbs, gutters, median, and adjusting structures to finish grade.
  - i. Restoring landscape and ground cover, resetting valve boxes and monuments, and other surface features disturbed by the work and cleaning.
  - j. Performing tie-ins.
  - k. Testing and inspection.
  - l. Daily cleanup, dust control, testing, and all incidentals required by these Specifications and Drawings.

- m. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

P. SETTLEMENT MONITORING (BASE BID ITEM NO. 27)

- 1. Measurement and payment for SETTLEMENT MONITORING shall be per each survey period and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
  - a. All equipment, materials, and personnel required to perform the work in accordance with Section 02306 of the Contract Documents.
  - b. Furnishing and installing geotechnical instrumentation.
  - c. Surveying.
  - d. Establishing baseline readings.
  - e. Properly maintaining instrumentation.
  - f. Survey monitoring of instruments per the required intervals and duration.
  - g. Reporting of readings and interpretations.
  - h. Replacement of damaged instruments.
  - i. Removal of instrumentation and site restoration in accordance with the Specifications.
  - j. All other work and procedures necessary to comply with the Caltrans Encroachment Permit and these Specifications.

Q. PRESSURE TESTING (BASE BID ITEM NO. 28)

- 1. Measurement and payment for PRESSURE TESTING shall be on a Lump Sum basis with partial payments made at the same percentage as the length of pipe pressure tested to total pipe length, and shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
  - a. All Submittals.
  - b. Filling and testing the pipe system.
  - c. Legal disposal of water into City sewer at a maximum flow rate of 250 gpm, if required.
  - d. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

R. ASPHALT RESTORATION (BASE BID ITEM NO. 29)

- 1. Measurement and payment for ASPHALT RESTORATION shall be on a unit price PER TON basis and shall include furnishing all labor, materials, tools, equipment, and incidentals required to satisfy the City of Healdsburg and Sonoma County Trench Cut Policy, the contract plans and these specifications including, but not limited to, the following:
  - a. All submittals.

- b. Protecting existing striping.
  - c. Applying tack coat to all surfaces to be covered by hot mix asphalt.
  - d. Placement and compaction of hot mix asphalt pavement.
  - e. Replacing all pavement striping, markers and markings removed or damaged by the Contractor's activities.
  - f. Testing.
  - g. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.
- S. DEMOLITION AND CONSTRUCTION DEBRIS DISPOSAL / RECYCLING (BASE BID ITEM NO. 30)
- 1. Measurement and payment for DEMOLITION AND CONSTRUCTION DEBRIS DISPOSAL / RECYCLING shall be on a Lump Sum basis with partial payments made at the same percentage as total project completion, and shall include furnishing all labor, materials, and incidentals including, but not limited to, the following:
    - a. Proper disposal and recycling of construction debris in compliance with City ordinances, the contract documents and all applicable codes.
    - b. Preparing, submitting and obtaining acceptance from the Engineer for monthly Recycling of Disposal Materials Reports in compliance with City ordinances, the contract documents, and all applicable codes, and no additional compensation will be allowed.
- T. STAND-BY TIME AS DIRECTED BY THE ENGINEER (BASE BID ITEM NO. 31)
- 1. Measurement and payment for STAND-BY TIME AS DIRECTED BY THE ENGINEER shall be on a unit price PER HOUR basis, and shall include furnishing all labor, materials, and incidentals including, but not limited to, the following:
    - a. As described in the contract documents, the Oak Mound Cemetery may conduct interment ceremonies with minimal notice provided. If the Contractor is actively working within the cemetery when a ceremony is to occur, the Contractor shall temporarily vacate the cemetery property. The Engineer will provide a number of work hours that can be paid to the Contractor to compensate the Contractor for this unscheduled stand-by time and no additional compensation will be allowed.
- U. WATER CROSSING OVER OR UNDER A STRUCTURE NOT SHOWN ON THE PLANS (BASE BID ITEM NO. 32)
- 1. Measurement and payment for WATER CROSSING OVER OR UNDER A STRUCTURE NOT SHOWN ON THE PLANS shall per each crossing installed. Based on available information from records search and limited field investigations, the contract drawings show the existing utilities that cross the proposed recycled water alignment. Where the Contractor's potholing determines that the proposed vertical alignment is in direct conflict with the potholed utility, the Contractor shall install a water main crossing over the structure per City Standard Detail WL 11, or a water main crossing under the structure per City Standard

Detail WL 12. The Contractor's proposed alignment must be accepted by the Engineer before commencing work and requesting payment for this bid item.

2. This bid item shall include furnishing all labor, materials, tools, equipment, and incidentals including, but not limited to, the following:
  - a. All submittals.
  - b. Surveying.
  - c. Ductile iron fittings, 45-degrees or less.
  - d. Thrust blocks.
  - e. Retainer glands restraint system.
  - f. Tie rods.
  - g. Stainless steel hardware.
  - h. The trenching, excavation, backfill, compaction, pipe installation required in addition to those included in Bid Items 6 and 7.

V. OVER EXCAVATION AND FILL WITH FILTER FABRIC WRAPPED DRAIN ROCK AS DIRECTED BY THE ENGINEER (BASE BID ITEM NO. 33)

1. Measurement and payment for OVER EXCAVATION AND FILL WITH FILTER FABRIC WRAPPED DRAIN ROCK AS DIRECTED BY THE ENGINEER shall be on a unit price PER CUBIC YARD basis. The Contractor shall request payment for the bid item when the Engineer and the Contractor's geotechnical engineer state that the trench bottom is unsuitable. The bid item shall include furnishing all labor, materials, tools, equipment, and incidentals required to stabilize the trench bottom while satisfying the contract plans and these specifications including, but not limited to, the following:
  - a. All submittals.
  - b. 3/4-inch drain rock.
  - c. Geotextile fabric.
  - d. Geotechnical Testing.
  - e. Excavation and shoring below 6-inches below the pipe bottom, as other excavation and shoring are included in other bid items.
  - f. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

W. SAWCUT AND REMOVE PORTLAND CEMENT CONCRETE PAVEMENT AS DIRECTED BY THE ENGINEER (BASE BID ITEM NO. 34)

1. Measurement and payment for SAWCUT AND REMOVE PORTLAND CEMENT CONCRETE PAVEMENT AS DIRECTED BY THE ENGINEER shall be on a unit price PER CUBIC YARD basis. The Contractor shall request payment for the bid item when the Engineer states that Portland Cement Concrete (PCC) is under the asphalt pavement within the pipe trench width. The bid item shall include furnishing all labor, materials, tools, equipment, and incidentals required to stabilize the trench bottom while satisfying the contract plans and these specifications including, but not limited to, the following:

- a. All submittals.
- b. Sawcutting the PCC.
- c. Removal of the PCC.
- d. Doing all work necessary to complete the work as shown on the contract documents, to comply with all applicable codes, and no additional compensation will be allowed.

#### 1.04 SCHEDULE OF VALUES

- A. A Schedule of Values shall be prepared for the Bulk Fill Station.
- B. At the pre-construction meeting, submit a preliminary Schedule of Values to the Owner's Representative for review. Incorporate any review comments from the Owner's Representative, and submit a final Schedule of Values at least 21 days prior to submitting the first Application for Payment for this bid item.
- C. The Schedule of Values shall assign a fair, reasonable and equitable dollar value for each activity on the Contractor's construction schedule. The Schedule of Values shall include anticipated progress payments for each item in the bid schedule through the final payment. In addition, a detailed breakdown of lump sum prices shall be included in the Schedule of Values.
- D. The Schedule of Values shall specifically indicate installed cost for materials and equipment for the bid item.
- E. Each activity's assigned value shall consist of labor, equipment and materials cost and a prorata contribution to overhead and profit. Breakdown shall be so organized as to facilitate assessment of work and payment of subcontractors.
- F. The sum of the assigned values shall equal the lump sum price of the activity.
- G. If, in the opinion of the Owner's Representative or Owner, the Schedule of Values is not balanced, provide documentation substantiating the cost allocations of those activities believed to be unbalanced. Cost allocation will be considered unbalanced if an activity on the construction schedule has been assigned a disproportionate allocation of labor, direct, or overhead and profit costs which result in progress payment request(s) which would create a condition where insufficient funds are available to complete the unfinished work. Upon request by Owner, support values shall be given with data that will substantiate their accuracy. Upon Owner's request, submit additional detailed cost information.
- H. Upon acceptance of the Schedule of Values, it shall be used as a basis for processing all progress payment requests for the Bulk Fill Station bid item.

#### 1.05 PROGRESS PAYMENT REQUESTS

- A. Submit Progress Payment Requests during the course of the project in conformance with the General Condition.
- B. Submit record drawings at completion of the project. The demobilization costs will not be paid until record drawings have been submitted and deemed complete by the Engineer.

**END OF SECTION**



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**SECTION 01320**  
**CONSTRUCTION SCHEDULE**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Procedures for preparing and revising the construction schedule used for planning and managing construction activities.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
  - 1. Special Provisions Section 3 – Control of Work and Material

1.03 COORDINATION WITH GENERAL CONDITIONS

- A. Prepare and submit a Preliminary Schedule in accordance with the requirements of SP-03.
- B. The Contractor's execution of the Work shall begin based on the Preliminary Schedule accepted by the Engineer. As Work progresses, the Schedule shall be updated and resubmitted in accordance with the requirements of this Section.

1.04 USE OF SCHEDULE

- A. The schedule and subsequent updates provide a basis for determining the progress status of the project relative to the completion time, specific dates, and for determining the acceptability of the Contractor's progress payment estimates.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

3.01 DESCRIPTION

- A. The Contractor shall prepare a time scale network schedule using a critical path method. A general guide for preparing such a schedule is contained in "The Use of CPM in Construction, a Manual for Contractors," published by the Associated General Contractors of America.
- B. The schedule shall depict all significant construction activities and all items of work listed in the breakdown of contract prices submitted by the Contractor in accordance with Sp-03.
  - 1. Indicate assigned values for each part of the work.
  - 2. Indicate dependencies between activities to establish the effect the progress of any one activity has on the schedule.
- C. Completion time shall be shown on the schedule. Activities making up the critical path shall be identified.

- D. No activity on the schedule shall have a duration longer than 21 days or assigned value greater than \$50,000, except activities comprising only fabrication and delivery, which may extend for more than 21 days.
  - 1. Activities that exceed these limits shall be divided into more detailed components.
  - 2. The scheduled duration of each activity shall be based on the work being performed during the normal 40-hour workweek with allowances made for legal holidays and normal weather conditions.

### 3.02 SUBMITTAL PROCEDURES

- A. Submit Preliminary Schedule in accordance with SP-03.
- B. Submit the following items:
  - 1. Two copies of the project schedule formatted to fit 11x17 inch sheets.
  - 2. Electronic file of the schedule.
- C. The Engineer will review the Preliminary Schedule to ascertain compliance with specified project constraints, compliance with milestone dates, reasonableness of durations and sequence, accurate inter-relationships and completeness.
- D. Review comments will be transmitted to Contractor following completion of preliminary review.
- E. Revise and resubmit schedule in accordance with written comments, or request joint meeting to resolve objections.
- F. When schedule reflects the Engineer and Contractor's agreement of project approach and sequence, schedule will be accepted as the Base Schedule. Use the accepted Base Schedule for planning, organizing and directing the work and for reporting progress.

### 3.03 UPDATING THE SCHEDULE

- A. Submit an updated schedule with each Application for Payment.
- B. Progress payment requests may not be processed by Engineer if updated schedule has not been submitted or if update is found unacceptable.
- C. Prepare update using most recent accepted version of schedule including:
  - 1. Actual start date of activities that have been started.
  - 2. Actual finish date of activities that have been completed.
  - 3. Percentage of completion of activities that have been started but not finished.
  - 4. Actual dates on which milestones were achieved.
- D. Submit narrative report in conjunction with updated schedule describing:
  - 1. Activities added to or deleted from schedule. Identify added activities in manner distinctly different from original activity designations.
  - 2. Changes in sequence or estimated duration of activities.

3. Current or anticipated problems and delays affecting progress, impact of these problems and delays and measures taken to mitigate impact.
4. Assumptions made and activities affected by incorporating change order work into the schedule.

#### 3.04 REVISIONS TO SCHEDULE

- A. Submit revised schedule within five (5) days when:
  1. Delay in completion of any activity or group of activities indicates an overrun of the contract time or milestone dates by twenty (20) working days or five (5%) percent of the remaining duration, whichever is less.
  2. Delays in submittals, deliveries, or work stoppages are encountered making necessary the replanning or rescheduling of activities.
  3. The schedule does not represent the actual progress of activities.
  4. Any change to the sequence of activities, the completion date for major portions of the work, or when changes occur that affect the critical path.
  5. Contract modification necessitates schedule revision; submit schedule analysis of change order work with cost proposal.
- B. Submit printed copies of the revised schedule and electronic file.
- C. Make revisions on most recently accepted version of schedule.

#### 3.05 THREE WEEK "LOOK AHEAD" SCHEDULE

- A. In addition to the overall Construction Schedule, provide a "Look Ahead" schedule in bar chart format. Show work activities undertaken in the preceding week and the work activities that will be undertaken during the upcoming three weeks.
- B. Prepare the Look Ahead schedule weekly and submit to the Engineer at the weekly construction progress meeting.

**END OF SECTION**

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## SECTION 01330

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. Requirements for the submittal of 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.
- B. Furnish drawings, specifications, descriptive data, certificates, samples, test results, methods, schedules, manufacturer's installation instructions and other information as indicated.

##### 1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
  - 1. Section 01999 – Reference Forms

##### 1.03 CONTRACTOR'S RESPONSIBILITIES

- A. 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. 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. Extraneous materials shall be crossed out or otherwise obliterated.
- C. Coordinate submittals among subcontractors and suppliers. Ensure that there is no conflict with other submittals and notify the Engineer in each case where his submittal may affect the work of another contractor or the Owner, including those submittals complying with unit responsibility requirements specified in applicable technical sections.
- D. Coordinate submittals with the Work so that work will not be delayed. 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.
- E. Do not proceed with work related to a submittal until the submittal process is complete and the submittal has received a response "No Exceptions Taken" or "Make Corrections Noted."
- F. Certify on each submittal document that the Contractor has reviewed the submittal, verified field conditions, and complied with the contract documents.
  - 1. Include a copy of the specification section with addendum updates, all referenced and applicable sections, and each paragraph check-marked to indicate

specification compliance or marked to indicate requested deviations from specification requirements.

- a. Use check marks (✓) to denote full compliance with a paragraph as a whole.
  - b. If deviations from the specifications are indicated and, therefore requested by the Contractor, underline each deviation and denote by a number in the margin to the right of the identified paragraph.
  - c. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications.
  - d. Include a detailed, written justification for each deviation.
2. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

#### 1.04 REVIEW COSTS

- A. The Engineer's cost for review of submittals for the same proposed materials, equipment or work will 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.

#### 1.05 SUBMITTAL INDEX

- A. Within 30 days of the Notice to proceed, submit a list, by specification section, of all submittals to be submitted.
- B. Update and resubmit the submittal index on a monthly basis where additional submittals are identified, or as necessary

#### 1.06 CATEGORIES OF SUBMITTALS

- A. General
  1. Submittals fall into two general categories;
    - a. Submittals for review and comment require action by the Engineer.
    - b. Submittals that are primarily for information only do not require Engineer's approval.
- B. Submittals for Review and Comment
  1. Transmit submittals for review and comment to the Engineer. The Engineer will review the submittal for compliance with the Contract requirements and will provide written comments regarding acceptability.

C. Submittals for Information Only

1. Where specified, furnish submittals to the Engineer for information only. The Engineer may, at the Engineer's option, review and comment on any product data.
2. Incomplete or inadequate product data will be returned to the Contractor for resubmittal.

1.07 TRANSMITTAL PROCEDURES

A. General

1. Transmit submittals regarding material and equipment under cover of a Shop Drawing/Transmittal Form, See Section 01999. Contractor may provide transmittal form or request a copy of the form from the Owner.
2. Use a separate form for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required.
3. Identify submittal documents common to more than one piece of equipment with all the appropriate equipment numbers.
4. Make submittals for various items 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.
5. Assign a unique sequential number on the transmittal form accompanying each item submitted.
  - a. Use the following format for original submittal numbers: "XXX"; where "XXX" is the sequential number assigned by the Contractor.
  - b. Use the following format for resubmittals: "XXX-Y"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals, i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. Submittal 25B, for example, is the second resubmittal of submittal 25.

B. Electronic Submittals

1. Electronic submittals are preferred except as otherwise indicated.
2. Prepare electronic submittals and Shop Drawings in electronic (\*.pdf) format including half-sized and full-sized drawings, catalog information and other required submittal information.
3. Break down submittals that are larger than 10 megabytes into smaller sections, using logical division points to create sections.
4. Electronically bookmark electronic submittals greater than 30 pages in length by major submittal section to facilitate ease of navigation.

- C. Paper copy submittals are an acceptable alternative to electronic submittals if the Contractor demonstrates, to the satisfaction of the Engineer, that electronic submittals presents a hardship.

- D. Deviation from Contract
  - 1. If the Contractor proposes to provide material, equipment, or method of work that deviates from the project manual, so indicate under "Proposed Deviations" on the transmittal form accompanying the submittal copies.
- E. Submittal Completeness
  - 1. Submittals that do not have all the information required to be submitted, including deviations, are not acceptable and will be returned without review.

#### 1.08 SUBMITTAL CONTENT

- A. Prepare submittals in compliance with individual Specification Sections and as indicated herein.
- B. Shop Drawings:
  - 1. Develop project-specific, scaled drawings to fully identify materials and products that will be provided and their relationship to other products that will be furnished and installed.
  - 2. Do not utilize reproductions of the Contract Documents as the basis for the submittal.
  - 3. Identify products, assemblies, equipment and systems.
  - 4. Provide equipment identification numbers or tag numbers, wiring diagrams, and setting diagrams.
  - 5. Identify critical dimensions.
- C. Product Data:
  - 1. Provide information necessary to demonstrate conformance with the specified requirements. Include performance curves, specifications, and wiring diagrams.
  - 2. Product data may consist of manufacturer's standard catalog information and data sheets, marked to indicate the specific products that will be provided.
  - 3. Provide supplemental information as necessary to fully demonstrate how products will be modified from the manufacturer's standard products to meet the specification requirements.
- D. Manufacturer's Instructions: Written or published information that establishes the manufacturer's recommendations, guidelines and procedures for handling and installation of products, equipment and assemblies.
- E. Samples: Mount, display or package samples in a manner that will facilitate review and establish workmanship and quality of materials.

#### 1.09 SUBMITTAL REQUIREMENTS

- A. When the Contract Documents require a submittal, submit the specified information as follows:
  - 1. Submittals for Review and Comment:

- a. Electronic Submittal: Submit one electronic (\*.pdf) submittal.
2. Submittals for Information Only:
  - a. Electronic Submittal: Submit one electronic (\*.pdf) submittal.

#### 1.10 REVIEW PROCEDURE

##### A. General

1. The Engineer will review submittals within the processing time identified in paragraph "Processing Time" and return:
  - a. Electronic Submittal – a signed submittal response document, in (\*.pdf) format.
  - b. Paper Copy Submittal – Two marked up copies of the submitted copies. The reproducible original will be retained by the Engineer.

##### B. Submittals for Review and Comment

1. The returned submittal will indicate one of the following actions:
  - a. "NO EXCEPTIONS TAKEN" – The material, equipment or work method complies with the project manual.
  - b. "MAKE CORRECTIONS NOTED" – Limited corrections are required.
    - 1) Provide a corrected copy where:
      - a) The information is to be included in the O&M data.
      - b) If requested by the Engineer.
  - c. "AMEND AND RESUBMIT" – The submittal is insufficient or contains incorrect data.
  - d. "REJECTED – SEE REMARKS" – The material, equipment, or work method does not comply with the project manual. Submittals with deviations that have not been identified clearly may be rejected.
2. For submittals marked "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."
  - a. The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with any noted corrections.
3. For submittals marked "AMEND AND RESUBMIT" or "REJECTED – SEE REMARKS"
  - a. Provide a typed letter responding to each of the Engineer's review comments with each resubmittal.
  - b. Except at its own risk, the Contractor shall not undertake the work covered by such submittals until a new submittal is submitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

##### C. Submittals for Information Only

1. The returned submittal will indicate "ACCEPTED FOR RECORD" if the submittal is complete and adequate.

2. Engineer may return comments on information submittals to identify concerns with what was submitted, in such case, address concerns in writing and return a revised submittal.

#### 1.11 PROCESSING TIME

- A. Prepare submittals and transmit to Engineer for review in sufficient time to allow Engineer's review; manufacture, fabrication or assembly of materials and systems; and shipping of material to the site in time for installation in accordance with the Contractor's schedule.
- B. Engineer's time for review will begin upon receipt of a complete and comprehensive submittal containing all required information.
- C. Engineer will review submitted information and transmit a response to Contractor within 14 days after receipt, subject to the following:
  1. In some instances, review times for specific submittals may be modified by the individual specification Section.
  2. Resubmittals will be subject to the same review time.
- D. No adjustment of Contract Time or Contract Price will be allowed due to delays in the progress of the Work that are caused by rejected submittals and subsequent resubmittals.

#### 1.12 EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS

- A. The purpose of submittals is to demonstrate how Contractor intends to conform to the Contract Documents and design concepts. Engineer is entitled to rely upon the accuracy and completeness of designs, calculations, or certifications made by licensed professionals whether or not a stamp or seal is required by the Contract Documents.
- B. The review procedure is based on the Contractor's guarantee that all features and characteristics not requiring submittals conform to the contract documents.
- C. Review of contract drawings, methods of work, or information regarding materials or equipment the Contractor proposes to provide, does not relieve the Contractor of its responsibility for
  1. Fulfilling the requirements of the Contract,
  2. Proper operation of the equipment,
  3. Correction of defective work
- D. Reviews shall not be regarded as an assumption of risk or liability by the Engineer or the Owner.
- E. A mark of "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED" means that the Owner has no objection to the Contractor, upon its own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.
- F. 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.
- G. Review of a separate item does not indicate approval of the assembly in which the item functions.

### 1.13 SUBSTITUTIONS OR "OR EQUAL" ITEMS

#### A. Named or Sole Source Times

1. 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.
2. 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. Initiating Substitution Request

1. To propose to furnish or use a substitute item of material or equipment, use the Proposed "Or Equal" Substitution Submittal Transmittal Form found in Section 01999.
2. Submit the Substitution Submittal form to Engineer for acceptance, 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.
3. State that the evaluation and acceptance of the proposed substitute will not prejudice Contractor's achievement of Substantial Completion on time, whether acceptance of the substitute for use in the Work will require:
  - a. 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.
  - b. Incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty.
4. Identify all variations of the proposed substitution from that specified
5. Identify available maintenance, repair, and replacement service
6. Provide 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

7. The Owner, Construction Manager, or Engineer may require Contractor to furnish at Contractor's expense additional data about the proposed substitute.
  8. If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, Contractor may propose to furnish or utilize a substitute means, method, sequence, technique or procedure of construction. Submit sufficient information to allow Engineer to determine that the proposed substitution is equivalent to that indicated or required by the Contract Documents.
- C. Review Procedure
1. The procedure for review of substitutions by Engineer will be similar to that provided in this Section.
  2. Requests for substitutions may only be submitted by the Contractor.
  3. All requests for substitution shall be submitted within thirty (30) calendar days after the date of Notice to Proceed unless the Engineer has agreed in writing to a later submittal date and the Contractor agrees to comply with all conditions of the Owner for the late submittal.
  4. The Engineer's agreement to a later submittal date shall not be construed as favorable review or acceptance of the proposed "or equal" substitution.
  5. The Engineer will respond to all requests for substitutions within thirty (30) days following receipt of an acceptable substitution submittal, unless the Engineer notifies the Contractor within fourteen (14) days after receipt of the proposed "or equal" substitution submittal that more time is needed to complete a thorough review.
  6. The Engineer and Owner will be the sole judge of acceptability, and no proposed "or equal" substitution item or service 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.
  7. As a condition of acceptance, the Engineer may require Contractor to furnish, at Contractor's expense, a special performance guarantee or other surety with respect to a proposed "or equal" substitution item or service.
- D. Modification due to Substitutions
1. All costs for redesign required by the implementation of the proposed substitute shall be borne by the Contractor.
  2. All costs associated with incorporating a substitution into the project shall be borne by the Contractor.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01340

### REQUESTS FOR INFORMATION AND CLARIFICATIONS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Procedures for submitting requests for information and clarifications when Contractor discovers apparent conflicts, omissions, or errors in the Contract Documents, or upon having any questions concerning interpretation of the Contract Documents.

##### 1.02 REFERENCED SECTIONS

- A. The following Section is referenced in this Section
  - 1. Section 01999 – Reference Forms

##### 1.03 PROCEDURES

- A. Notification:
  - 1. Notify the Engineer in writing and request interpretation, clarification, or additional detailed instructions concerning the Work.
  - 2. Ask for clarification or request information immediately upon discovery, but no less than seven working days prior to the start date of the activities related to the clarification, based on the latest updated version of the official contract schedule.
- B. Form:
  - 1. Submit requests for clarification and/or additional information in writing to the Engineer using the Request for Information (RFI) form provided in Section 01999.
  - 2. Provide a detailed statement indicating the nature of the information requested. Reference specific Drawings and Specifications as appropriate.
  - 3. Limit each written request to one topic.
  - 4. Electronic (\*.pdf) format RFIs are preferred. Prepare RFIs and any attachments in electronic format. Transmit electronic RFIs via email to the Engineer. Break down RFIs that are larger than 4 megabytes into smaller sections, using logical division points to create sections.
  - 5. Hard copy RFIs are an acceptable alternative to electronic RFIs if the Contractor demonstrates, to the satisfaction of the Engineer, that electronic format presents a hardship. If hard copies are used, furnish six (6) copies of each RFI.
- C. Numbering:
  - 1. Use consecutive numbers for each new form submitted. When RFI's are re-submitted to request additional information on the same topic, add a letter A, B, C, etc. to the numbering system for each subsequent RFI until the subject is resolved.

##### 1.04 REASONS FOR SUBMITTAL

- A. Submit an RFI if one of the following conditions occur:

1. An unforeseen condition or other circumstance that is not described in the Contract Documents.
2. An apparent conflict or discrepancy between portions of the Contract Documents.
3. An apparent omission from the Contract Documents.
4. Information presented in the Contract Documents is unclear or additional details are needed to undertake the Work.

#### 1.05 RESPONSE TIME

- A. The Engineer will resolve the RFI and issue instruction to the Contractor within 14 calendar days.
- B. Response time may need to be lengthened; or shortened for emergency situations as mutually agreed upon by all parties.
- C. Do not proceed with the affected work before receipt of a response from the Engineer. Should the Contractor elect to proceed with the Work affected by the RFI, any portion of the Work that is not done in accordance with the Engineer's interpretation, clarifications, instructions or decisions will be subject to removal or replacement at the Contractor's expense.

#### 1.06 REJECTIONS

- A. RFI's submitted by the Contractor may be rejected by the Engineer for the following reasons:
  1. The RFI is submitted as a substitute for a submittal.
  2. Under the pretense of a Contract Documents discrepancy or omission without thoroughly reviewing the documents.
  3. 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. In an untimely manner without proper coordination and scheduling of work or related trades.

#### 1.07 ADDITIONAL DETAILED INSTRUCTIONS (CLARIFICATIONS)

- A. The Owner may furnish additional detailed written instructions to further explain the Work and these instructions shall become part of the Contract Documents. Clarifications will be issued using the above RFI system.
- B. When, in the opinion of the Contractor, the Engineer's response in the RFI constitutes additional work beyond the scope of the Contract, the Contractor shall notify the Engineer in writing following receipt of the RFI and prior to initiating the Work affected by the RFI. The process for submitting claims of additional Work shall be followed as defined in the General Conditions. Lack of compliance with this notification requirement will cause Contractor to forfeit any claim for additional compensation or extension of the schedule.

**END OF SECTION**

**SECTION 01400**  
**CONSTRUCTION STAKING**

**PART 1 - GENERAL**

1.01 DATUM

- A. Vertical and horizontal datum are based on the coordinates and benchmarks shown on the Drawings or as provided by Engineer prior to the start of construction. Locate and protect Engineer furnished control points prior to starting the Work and preserve control points during construction. Re-establish control points disturbed by operations at no cost to Owner.
- B. Establish other vertical and horizontal control from these reference points as required to properly layout and construct the Work. Install connections based on actual elevations of existing structures to which connections are made.

1.02 ACCURACY OF INFORMATION

- A. Dimensions for existing structures, piping, paving, and other nonstructural items are taken from the available information provided by the Engineer. Field verify 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 Engineer's attention by written notification.

1.03 CONSTRUCTION STAKING

- A. Construction staking shall be provided by the Contractor to establish the vertical and horizontal controls necessary to lay out the Work. The Engineer will provide the control data.
- B. Contractor shall bear the cost of replacement staking if the initial staking is damaged and must be replaced.

1.04 LAYOUT AND MEASUREMENT TO BE PERFORMED BY CONTRACTOR

- A. Contractor is responsible for conducting field surveys required to lay out components of the Work at the proper alignment, elevation, grades, dimensions, and distances indicated on the Drawings.
- B. Lay out the Work from the lines and grades provided by the Engineer and from the dimensions and elevations provided on the Drawings. Contractor is responsible for measurements required for the execution of the Work.
- C. Furnish stakes, equipment, tools, materials, and labor as required for layout work.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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## SECTION 01410

### PERMITS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Permits required for project construction.

##### 1.02 PERMITS OBTAINED BY CITY

- A. The City has obtained or applied for and not yet received the following permits required to construct the project. Proper notification to the agencies affected is the responsibility of the Contractor. The Contractor shall conform to the requirements of the permits and all costs therefor shall be included in the contract prices bid for the items involved. Copies or sample copies of these permits are included in the Appendices of the Contract Documents.
- B. Permits that have been obtained.
  - 1. CAL OSHA Mining and Tunneling Unit Underground Classification: The State of California Department of Industrial Relations, Division of Occupational Safety and Health (CAL OSHA) Mining and Tunneling Unit has assigned the underground classification of "Potentially Gassy with Special Conditions" for this Project. The Contractor shall comply with conditions and regulations of CAL-OSHA. Copies of the Underground Classifications are included in Appendix B of the Contract Documents.
  - 2. Caltrans Encroachment Permit 04-23-NUS-1659 (Parent Permit): The City has obtained a Caltrans Encroachment Permit for this Project. A copy of the permit is included in Appendix A.
- C. City will pay for electrical, telephone, gas and other utility-company design, engineering, connection, and relocations fees imposed by various companies for the work. Payment of fees by the City shall not relieve the Contractor of the responsibility to obtain and coordinate permits and comply with all utility company requirements. All permits, licenses, and other authorizations shall be secured in sufficient time to prevent delays to the work.

##### 1.03 PERMITS TO BE OBTAINED BY CONTRACTOR

- A. City of Healdsburg Encroachment Permit:
  - 1. Contractor shall prepare traffic control plans, post necessary bonds, obtain final permit prior to construction, and follow all provisions in the permit during construction.
- B. County of Sonoma:
  - 1. The City has initiated the encroachment permit application process. The application record number is: ENC23-0061. Prior to the encroachment permit being issued, Permit Sonoma will require receipt of the following:

- a. Name of Contractor company performing the work, their license number, address and contact information, including name, phone number and email of the on-site contact for the Contractor.
  - b. A copy of the Contractor’s certificate of liability insurance and endorsement naming “Sonoma County its Officers and Employees” as additionally insured (ENC-002).
  - c. Traffic control plan (TCP) meeting the requirements of Caltrans MUTCD. An initial TCP and plan check comments are attached in Appendix D.
  - d. Bonding will be required for this work. A \$10,000 credit card payment, cashier’s check or embossed surety bond on County of Sonoma document, is required prior to permit issuance. Permit Sonoma no longer allows surety bonds covering multiple projects; each individual project requires an individual bond.
- 2. Contractor shall follow all provisions in the permit during construction.
  - 3. Contractor shall provide two changeable message boards a minimum of 10 days prior to road closures within the County of Sonoma. Notification of road closure shall be emailed to SPI-LandDev-Referrals@sonoma-county.org a minimum of (5) days prior to start of Work. REDCOM must be notified a minimum of 48 hours prior to closure.
  - 4. The City will pay permit and initial inspection fees directly to the County. The Contractor will be responsible for paying all fees for reinspection due to substandard or incomplete work.
- C. Sonoma-Marin Area Regional Transit:
    - 1. Contractor shall fill out and submit the application for entry permit form, prepare traffic control plans (if applicable), and pay all fees.
    - 2. Contractor shall provide certificate of Insurance with all endorsements.
    - 3. Application for entry permit and insurance requirements are provided in Appendix C.
  - D. Caltrans Encroachment Permit:
    - 1. Apply for and obtain a Caltrans Encroachment Permit (Double Permit)
      - a. Reference permit number from parent permit obtained by City. A copy of the parent permit is included in Appendix A.

1.04 PERMIT-REQUIRED INSPECTION COSTS

- A. Contractor shall pay the cost of inspection by Permit Issuer for work that is required by permit conditions to be performed on weekends or outside normal working hours. See individual permits for inspection requirements.

**END OF SECTION**

**SECTION 01500**  
**CONSTRUCTION FACILITIES AND UTILITIES**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Requirements for Contractor's temporary facilities at the job site and for the prosecution of the Work.

1.02 EASEMENTS

- A. Temporary construction easements and permanent easements have been established by the Engineer.
- B. Contractor shall confine equipment, materials storage and all construction activities within the temporary easements shown.

1.03 CONTRACTOR'S CONSTRUCTION OFFICE

- A. Maintain a suitable office at the site.
- B. Temporary office will be considered as the headquarters of the Contractor's representative who is authorized to receive drawings, instructions, or other communication or articles. Any communication given to the representative or delivered at Contractor's temporary office at the site in his absence is deemed to have been delivered to the Contractor.
- C. Maintain copies of the Drawings, Specifications, and other Contract documents at Contractor's temporary office at the site and make these available for use at all times.

1.04 STAGING AREA

- A. Before starting the work, submit a proposed plan and layout for all temporary offices, sanitary facilities, storage areas, temporary water service and distribution, and temporary power service and distribution.
- B. Erect temporary security fence as appropriate. Contractor is responsible for the security of the staging area. Engineer does not take any responsibility for missing or damaged equipment, tools or personal belongings.
- C. Store only those materials and equipment that are related to the construction within the staging area.

1.05 ACCESS TO TAYMAN GOLF COURSE FROM MASH DRIVE

- A. Contractor shall gain access onto the golf course property in coordination with the Golf Course. To obtain access, the Contractor shall coordinate with Frank Johnson at (707) 291-1174 a minimum of 48-hours before ingress/egress is scheduled.
- B. Access to the Tayman Golf Course irrigation tank shall be through the golf course parking lot and existing access roads routed westerly. No crossings of golf course fairways, greens or tee boxes shall be allowed.

- C. Contractor is responsible for securing the property until fencing is returned to original conditions and all temporary fences, culverts and backfill material has been removed and the area returned to its original condition.

1.06 PROJECT SIGN

A. Sign Requirements

- 1. This project is funded in part by the “Urban and Multibenfit Drought Relief Program” (Budget Act of 2021) and shall include two posted signs acknowledging the source of the funds following guidelines developed by the California Natural Resources Agency.
- 2. Provide, install and maintain, for the duration of the project, two project-funding signs as designated below. The signs shall be initially installed where directed by the Engineer within three (3) days of Notice to Proceed. The Contractor shall move each sign as directed by the Engineer up to seven times during the construction duration so that the placements are near the moving work areas.
  - a. 8’ x 4’ marine grade sanded plywood, minimum 3/4-inch thick.
  - b. Two (2) coats exterior quality paint for background; one (1) coat exterior quality paint for lettering.
  - c. Erect on two (2) 4” x 4” smooth wood posts, painted white on secure foundation, rigidly braced and framed to resist loadings. Install sign surface plumb and level; anchor securely.
  - d. Keep signs a proper distance above prevailing grade to permit public viewing.
  - e. Paint letters blue (Blue No.15102 in federal color standard No.595).
  - f. DWR Logos are available through the Engineer who will obtain them from the Grant manager.
  - g. Remove signs at end of project.

B. Contents of Signs

- 1. The signs shall be prepared by an experienced professional sign-maker. Submit sign layout to the Engineer for approval prior to making.
- 2. See conceptual design sketch below (DWR logo must be a minimum of 1’ x 1’) that is not to scale.



## Municipal Recycled Water Pipeline

IMPLEMENTED BY  
City of Healdsburg



FUNDED UNDER  
THE BUDGET ACT OF 2021

ADMINISTERED BY  
Urban and Multibenefit Drought Relief Program  
California Department of Water Resources

ENGINEER: West Yost Associates

CONTRACTOR: < Contractor Name >

4'

8'

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION

#### 3.01 TEMPORARY ELECTRIC POWER

- A. Contractor shall make provisions to obtain temporary electric power for use during construction. The Contractor shall be responsible for obtaining a source of electric power for construction.
- B. Cost of electric power shall be borne by the Contractor.
- C. The temporary electric power installation shall meet the construction safety requirements of OSHA, state, and other governing agencies.

#### 3.02 TEMPORARY TELEPHONE SERVICE

- A. Provide telephone service at the construction site office. Cellular telephone service is acceptable.
- B. The Contractor is not permitted to use the Engineer's telephone service.

#### 3.03 TEMPORARY SANITARY FACILITIES

- A. Provide toilet and wash-up facilities for the construction work force at the site of work.
- B. Facilities shall comply with applicable laws, ordinances, and regulations pertaining to the public health and sanitation of construction field offices, dwellings, and camps.

### 3.04 TEMPORARY WATER SUPPLY

- A. Use recycled water for soil moisture conditioning, pipeline pressure testing and other construction uses. Recycled water runoff shall not enter the storm drains.
- B. Obtain approvals and authorizations from the Engineer of the recycled water distribution system for use of water.
  - 1. The City has two recycled water bulk filling stations. The bulk fill station locations are at Oppermans, 280 Kinley Dr, Healdsburg, CA and the City Water Reclamation Facility, 340 Foreman Lane, Healdsburg, CA.
  - 2. To obtain construction water from these sites, the Contractor shall complete a use agreement and get trained on the use of the stations.
  - 3. The Contractor shall fill their water trucks and transport the water from these stations to the work area.
  - 4. The Contractor will not be charged from the recycled water received at the bulk fill stations.

**END OF SECTION**

## **SECTION 01505**

### **MOBILIZATION AND DEMOBILIZATION**

#### **PART 1 - GENERAL**

##### **1.01 MOBILIZATION**

- A. Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the site; for the establishment of all facilities necessary for work on the project; and for all other work and operations which must be performed, or costs incurred prior to beginning work, on the various items on the project site.
- B. Mobilization shall also include the construction of temporary access ways; temporary fencing; and the necessary preparatory work required to allow for the safe and stable movement of all vehicles that are required to construct the improvements as shown.

##### **1.02 DEMOBILIZATION**

- A. Demobilization shall consist of work and operations necessary to disband all mobilized items and clean up the site. The removal of all temporary access ways, signs, temporary fencing, and temporary facilities or works and the restoration of surfaces to an equal or better than existing condition shall also be included as part of demobilization.

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01550**  
**TRAFFIC CONTROL**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Contractor furnished labor, materials, equipment, tools, and services necessary to provide access to the motoring and pedestrian public; and adequately safeguard the workers and public from construction hazards with a minimum of inconvenience.
- B. Work includes but is not limited to the following:
  - 1. Preparation of Traffic Control Plans (detailed drawings) and obtaining approval of Traffic Control Plans from the City of Healdsburg and County of Sonoma.
  - 2. Masking and restoring permanent signs and striping.
  - 3. Erection and removal of temporary construction signs.
  - 4. Installation and removal of temporary traffic control devices, including barriers and barricades and detour implementation.
  - 5. Coordinating work with all agencies having jurisdiction.
- C. Nothing in these special provisions shall be construed as relieving the Contractor from its responsibility as provided in Section 7-1.03, "Public Convenience," and Section 7-1.04, "Public Safety," of Caltrans Standard Specifications.

1.02 REFERENCED SECTIONS

- A. None

1.03 PROJECT SPECIFIC REQUIREMENTS

- A. Parking controls and two lanes of travel shall be open as much as possible with parking controls on both sides of the street. When only one lane of travel is open, two dedicated flaggers shall be required.
- B. Pipeline construction along Kinley Drive will require full road closure with traffic detour around the work area. The trenchless crossing under Highway 101 will require full road closures of Kinley Drive and Kennedy Lane for the bore and receiving pits. For all other work, at least one lane shall be open to traffic at all times.
- C. Traffic control shall be appropriate for school zone.

1.04 REFERENCE STANDARDS

- A. Comply with guidelines excluding payment sections of the latest editions of the following reference standards:
  - 1. California Manual on Uniform Traffic Control Devices (CA MUTCD).
  - 2. Caltrans Standard Specifications, most recent edition.
    - a. Section 7-1.03 Public Convenience
    - b. Section 7-1.04 Public Safety
    - c. Section 12, Temporary Traffic Control

3. Caltrans Standard Plans, most recent edition.
  4. Standard Specifications for Public Works Construction. "Green Book".
    - a. Section 7-10, Public Convenience and Safety.
  5. CAL/OSHA, State of California Construction Safety Orders.
    - a. Section 1599, Traffic Control for Public Streets and Highways.
    - b. Section 1599, Flaggers.
  6. OSHA, Code of Federal Regulations.
    - a. Title 19, Part 1926, Construction Safety and Health Regulations.
    - b. Title 29, Part 1910, Occupational Safety and Health Standards.
- B. In case of conflict between the above reference standards and the specifications contained herein, these specifications shall take precedence and be used in lieu of such conflicting portions.

#### 1.05 SUBMITTALS

- A. Traffic Control Plans: Submit, at least three (3) weeks prior to work, Traffic Control Plan drawings which conform to all requirements of these specifications, approved by the City of Healdsburg and County of Sonoma. Traffic Control Plans shall be provided for roadways and intersections affected by construction.
- B. A traffic control plan shall include systems of closing traffic lanes in accordance with the details shown on State Standard Plan T-13, the provisions of Section 12, "Temporary Traffic Control," of the State Standard Specifications, and the CA MUTCD.
- C. Traffic control plans shall be site specific. Standard plans may be referenced, but details shall be depicted on maps, images, or figures of actual road configurations at specific locations along the project. Photo copies of typical traffic control lane closure samples from the CA MUTCD, State Standard Plans or any other manuals shall not be accepted.
- D. All signs, signals, pedestrian and vehicle ramps, and barricades shall conform to the requirements of CAL/OSHA Construction Safety and Health Regulations. A Traffic Control Plan, following the requirements of the City of Healdsburg and County of Sonoma, shall be submitted to the Engineer and agencies having jurisdiction for review and approval. Traffic Control Plan shall contain, but not be limited to the following:
  1. Circulation and detour plans to minimize impacts on local street circulation during lane and road closures.
  2. Show the existing intersection lane configuration and the appropriate traffic control application for each approach. Location, placement, monitoring schedule and movement of all traffic control devices to be used to guide vehicles through and/or around the construction zone including, but not limited to, proper lane tapers, signs, flashing arrow boards, portable changeable message signs, "work ahead" and other advance warning signs, signals, pedestrian and vehicle ramps, barricades and flaggers.
  3. For work in-between intersections, submit a typical traffic control plan for mobile operations to the agency having jurisdiction for review and approval. Mobile operations shall include at least two (2) shadow vehicles equipped with truck-

mounted attenuators and arrow boards and shall follow the work vehicle. For streets with a posted speed limit of more than 40 mph, at least three (3) shadow vehicles equipped with truck-mounted attenuators and arrow boards shall follow the work vehicle. Advanced warning signs shall be placed along the roadway and shall be moved periodically as work progresses. The typical traffic control plan for mobile operations shall be applicable to all work in between intersections. Multiple typical traffic control plan mobile operations shall be submitted as required by the agency having jurisdiction.

4. For work within all other intersections, use a flagger to control the intersection in addition to the mobile operation. There shall be at least one (1) flagger assigned to each intersection approach.
  5. Identification of truck routes that minimize truck traffic on local roadways and residential streets will be utilized to the extent possible.
  6. Identification of detours for bicycles, where applicable, in all areas affected by project construction.
  7. Provisions for pedestrian access through the work zone during construction. If the work impacts any pedestrian pathway such as sidewalks, curb ramps, and crosswalks, the traffic control plan shall include a pedestrian handling plan to direct pedestrians safely through the construction work zone. The pedestrian handling plan shall conform to the most current CA MUTCD and State Standard plans and may include pedestrian detours, signs, temporary pedestrian path and ramps.
  8. Sufficient staging areas for trucks accessing construction zones to minimize disruption of access to adjacent land uses, particularly at entries to onsite pipeline construction within residential neighborhoods.
  9. Control and monitoring of construction vehicle movement through the enforcement of standard construction specifications by onsite inspectors.
  10. Scheduling of truck trips outside the peak morning and evening commute hours to the extent possible.
- E. The traffic control plans shall be submitted for all streets in the agency having jurisdiction as one package for review by the agency having jurisdiction; partial submittals may be rejected.
- F. The contractor shall be responsible for coordinating development of the Traffic Control Plan with the City of Healdsburg and County of Sonoma.
- G. No work will be allowed on City Streets or County Roads until the Contractor obtains written approval of the proposed Traffic Control Plan from agencies having jurisdiction.
- H. The temporary closure of a signalized intersection, when necessary, shall be done in accordance with a traffic control plan approved by the agency having jurisdiction prior to the start of work. Inform the Transportation Engineering Division of the agency having jurisdiction of the anticipated signal shutdown at least five (5) working days in advance of the work.

## 1.06 QUALITY ASSURANCE

- A. Traffic Control Plans shall be prepared by a qualified traffic management/traffic control firm or California Licensed Civil or Traffic Engineer. Plans shall be stamped by a California Licensed Civil or Traffic Engineer.
- B. The Traffic Engineer who prepared the Traffic Control Detail shall be available at any time during the life of the contract to modify the Traffic Control Detail if and as required by the agency having jurisdiction.
- C. No changes or deviations from the approved Traffic Control Detail shall be made, except temporary changes in emergency situations, with prior approval of the Traffic Engineer, the Engineer, and all agencies having jurisdiction.
- D. Any revisions to the traffic control plans shall be submitted by agency having jurisdiction 14 days in advance of the work.

## 1.07 REQUIRED NOTIFICATION

- A. Notify the following agencies and entities at least 48 hours prior to lane or roadway closures, reopenings, or partial obstruction of roadways.
  - 1. City of Healdsburg Fire Department
  - 2. City of Healdsburg Police Departments
  - 3. City of Healdsburg Public Works
  - 4. Sonoma County Transit
  - 5. Postal Service
  - 6. Schools
  - 7. Recology (Trash Collection Service Provider)
  - 8. Bell Ambulance
- B. Coordinate construction with facility owners or administrators of sheriff and fire stations (including all fire protection agencies), transit stations, hospitals, and schools. Facility owners or operators shall be notified in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures.

## PART 2 - MATERIALS

### 2.01 TRAFFIC CONTROL DEVICES

- A. All traffic control devices shall conform to the provisions in Caltrans Standard Specifications, Section 12, "Temporary Traffic Control," and to the CA MUTCD and the agency having jurisdiction.
- B. Included, but not limited to, are flag units, construction signs, channelizing devices, barricades, delineators, and lighting devices.
- C. All signs which are to convey their messages during darkness shall be reflectorized or illuminated.
- D. No signs or supports shall bear any commercial advertising.

- E. Portable flashing beacons shall conform to Caltrans Standard Specifications 12-3.31.

### **PART 3 - EXECUTION**

#### **3.01 PLACEMENT OF TRAFFIC CONTROL DEVICES**

- A. Each vehicle used to place, maintain and remove components of a traffic control system on multilane roads shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining, or removing the components. Vehicles equipped with a Type II flashing arrow sign not involved in placing, maintaining, or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion.
- B. Store all equipment and materials in designated contractor staging areas or adjacent to the worksite, such that traffic obstruction is minimized.
- C. Implement all roadside safety protocols. Advance “Road Work Ahead” warning and speed control signs (including those informing drivers of state legislated double fines for speed infractions in a construction zone) shall be posted to reduce speeds and provide safe traffic flow through the work zone. All excess and unsuitable material resulting from the Contractor’s operation shall be removed as it develops and before the end of each workday.
- D. Whenever vehicles or equipment are parked on the shoulder within 6 feet of a traffic lane, the shoulder area shall be closed with fluorescent traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. A minimum of 9 cones or portable delineators shall be used for the taper. A W20-1 (Road Work Ahead) or W21-5 (Shoulder Work) sign shall be mounted on a portable sign stand with flags.
- E. Use portable changeable message signs to provide advance notice of lane closures. All lane closures will require the placement of Changeable Message Signs (CMS). Messages shall be approved by the agency having jurisdiction. CMS shall be in place and operational at least two weeks in advance of construction.

#### **3.02 MAINTENANCE OFF TRAFFIC CONTROL DEVICES**

- A. If any component of the traffic control system is displaced, or ceases to operate or function as specified from any cause, during the progress of the work, immediately repair the component to its original condition or replace the component, and shall restore the component to its original location.

#### **3.03 REMOVAL OF TRAFFIC CONTROL DEVICES**

- A. When lane closures are made for work periods only, at the end of each work period, all components of the traffic control system, except portable delineators placed along open trenches or excavations adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations, approved by the agency having jurisdiction.

### 3.04 ACCESS TO ADJACENT PROPERTIES

- A. Provide and maintain access to adjacent properties at all times. Notify homeowners/occupants along the proposed construction route.
- B. Fire hydrants on or adjacent to the work shall be kept accessible to firefighting equipment at all times.
- C. Temporary provisions shall be made by the Contractor to assure the use of sidewalks and the proper functioning of all gutters, sewer inlets and other drainage facilities.

### 3.05 STREET CLOSURE

- A. No streets may be closed without first obtaining approval, in writing, from the City of Healdsburg and County of Sonoma. If permission is granted, it shall be the Permittee's responsibility to notify the agencies/departments in Paragraph 1.07 prior to closing the street.
- B. Request for street closure shall include detour and signage plans.

### 3.06 TRAFFIC COORDINATION WITH OTHER CONTRACTORS

- A. Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, alleyway, or parking area during the performance of the work hereunder, and the Contractor shall so conduct its operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleyways, or parking areas.
- B. Coordinate the traffic routing work with that of other forces working in the same or adjacent areas.

### 3.07 CONSTRUCTION PARKING CONTROL

- A. Curb parking shall be removed in accordance with the Traffic Control Plan. Removal of curb parking shall be minimized.
- B. Make arrangements directly with local authorities to keep the working area clear of parked vehicles.
- C. The Contractor may prohibit stopping in parking lanes where and when necessary in order to gain access to the work to provide the required traffic lanes in city streets and parking areas.
- D. Coordinate with City of Healdsburg and County of Sonoma for the location of "No Stopping" and "No Parking" signs.
- E. At least one (1) week in advance of construction, furnish and place, where approved by City of Healdsburg, County of Sonoma and the Engineer, portable "TOW AWAY – NO STOPPING" signs. The dates and times of parking removal shall be posted on the signs.
- F. Contractor is responsible for ensuring signs stay posted. "No Parking" signs shall be posted at a minimum spacing of 100 feet on portable barricades, delineators or similar devices furnished by the Contractor. In addition, a minimum of one (1) "No Parking" sign shall be posted between all driveways where on-street parking is normally allowed. Posting of "No Parking" signs will not be allowed on trees, sign posts, fences, etc.

- G. All “No Parking” signs shall list the anticipated dates of work. Dates posted on all “No Parking” signs shall be limited to provide a maximum two-day construction window unless otherwise authorized by the Engineer. If the work is not performed during the timeframe indicated on the “No Parking” signs, the work shall be rescheduled with at least five (5) working days advance notice. Leave the streets open to traffic until just prior to starting the work, and provide all barricades, signs and traffic control measures necessary to protect the work. The Contractor, at his expense, will perform all re-posting of “No Parking” signs and re-notification of business and residents as a result of his failure to meet the posted schedule.
- H. Any delays caused by failure of the Contractor to adhere to the approved schedule will be at the Contractor’s sole expense. No additional compensation will be allowed for costs resulting from said delays.
- I. Notify City of Healdsburg and County of Sonoma of all parking violators who require tow away from construction areas.
- J. Construction equipment not actively engaged in the work and employee vehicles shall not be parked in the vicinity of the work in such a manner as to further restrict or obstruct traffic flow.
- K. Vehicles and equipment in continuous or frequent use may be operated or parked in the same traffic lane as the work obstruction.

### 3.08 CONSTRUCTION SIGNING

- A. All construction area signs shall conform to Caltrans Standard Specifications 12-3.11.
- B. Sign spacing shall conform to the CA MUTCD.
- C. Signs normally shall be installed immediately before work is to commence and must be removed immediately after work is complete. If at any time a sign is not required, it shall be covered or removed.
- D. The Contractor shall be responsible for the placement of advisory signs to inform the public of any street closure, detour, or construction affecting traffic at least 7 days before the closure or other significant disruption of normal traffic flow.
- E. Existing roadside signs conflicting with the construction area signs shall be either removed and reset upon completion of work or securely covered.
- F. After the application of crack seal material, “Fresh Oil” (W21-2) signs shall be placed at the limits of work.

### 3.09 ILLUMINATION

- A. Provide sufficient visibility on a 24-hour basis to approaching traffic whenever a street is closed partially or completely. Ensure that sufficient illumination is provided by means of portable flashing beacons, floodlights, or other similar devices. Mount all lighting fixtures in a manner which precludes glare to approaching traffic.
- B. All barricades and obstructions shall be illuminated at night, and all lights shall be turned on from sunset until sunrise.

- C. Arrow boards or other traffic control devices and lighting which will operate outside of the normal working hours shall be battery-operated. The use of gas-fired generators during nonworking hours will not be allowed.

### 3.10 FLAGGING

- A. Flaggers shall be required:
  - 1. Where workers or equipment intermittently block a traffic lane.
  - 2. When trucks or equipment enter or leave the work site from an adjacent traffic lane
  - 3. Where plans or permit allow the use of one lane for two directions of traffic.
  - 4. Wherever the safety of the public and/or workers determine there is a need.
- B. Flagging shall be carried out in accordance with Caltrans Standard Specifications. All flagging costs shall be considered as included in pay items for traffic control.

### 3.11 PEDESTRIAN SAFETY AND BICYCLE ACCESS

- A. Maintain safe and adequate pedestrian zones and public transportation stops as well as provide pedestrian crossings at intervals not to exceed 300 feet within the work zone.
- B. When the construction area crosses a crosswalk, the crosswalk shall be barricaded and sign “No Ped Crossing Use Crosswalk” posted.
- C. Maintain pedestrian and bicycle access and circulation during project construction where safe to do so. If construction activities encroach on a bicycle lane, advance warning signs (e.g., “Bicyclists Allowed Use of Full Lane” and/or “Share the Road”) will be posted that indicate bicycles and vehicles are sharing the lane. If construction activities encroach on a sidewalk, safe crossings and appropriate signage will be provided for pedestrians.

### 3.12 NIGHT WORK

- A. No night work shall be permitted unless requested in writing by the Contractor and approved in writing by the agency having jurisdiction. In addition to schedule information traffic control and detour plans for specific locations shall be part of the Contractor’s request for night work.
- B. For all night work locations approved in writing, provide advanced special message signs placed at least seven (7) days prior to closing the intersection, but not more than fourteen (14) days in advance of the intersection closure. The advanced special message sign shall state the anticipated closure dates and times as shown on the plans. Notify the agency having jurisdiction not less than fourteen (14) calendar days prior to installing the advance intersection closure warning signs.
- C. The Contractor shall be responsible for maintaining accurate and timely information on the advanced special message signs. The signs, when no longer required or when the information becomes outdated, shall be immediately covered or removed, or the sign message shall be updated.

**END OF SECTION**

**SECTION 01560**  
**ENVIRONMENTAL CONTROLS**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Environmental controls to be maintained during construction.

1.02 APPLICABLE LAWS AND REGULATIONS

- A. Comply with applicable Federal, State and local environmental, health and safety laws and regulations.

1.03 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
  - 1. Section 01570 – Storm Water Quality Control
  - 2. Section 02241 – Control of Water

1.04 SUBMITTALS

- A. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
- B. Plan for disposal of waste materials and intended haul routes.
- C. Dust control plan.

1.05 SITE CLEANLINESS

- A. Maintain work sites, staging areas, public roadways and private property clean and free of rubbish and debris. Remove materials and equipment from the site when they are no longer necessary for the Work.
- B. Keep buildings that are occupied by the Contractor clear of refuse and debris and in a reasonably neat condition.
- C. Upon completion of the work and before final acceptance, clear work areas of equipment, unused materials, and rubbish to present a clean and neat appearance.

1.06 HAZARDOUS MATERIALS

- A. Handle paints, solvents, and other construction materials with care to prevent contaminants from entering into sewers, storm drains, surface waters, or soils.
- B. Develop an emergency response plan for spills of sewage, paint, oil, and other hazardous materials.
- C. In the event of a spill, immediately notify the ENGINEER, OWNER and jurisdictional agencies. Take proper measures to clean up spills of hazardous materials in accordance with the emergency response plan, State, Federal, and local regulations and manufacturer's recommendations.

#### 1.07 AIR POLLUTION CONTROL

- A. Contractor shall not discharge smoke, dust, and other contaminants into the atmosphere that violate the air pollution regulations for the area.
- B. Do not idle internal combustion engines for prolonged periods of time.
- C. Minimize dust nuisance by cleaning, sweeping and sprinkling work areas, exposed soil, and haul roads with water or by powered brushing.

#### 1.08 NOISE CONTROL

- A. Comply with local controls and noise level rules, 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. Minimize noise from construction equipment.
  - 1. Whenever possible, utilize construction equipment powered by electric motors rather than diesel or gas driven engines.
  - 2. Locate construction equipment such as compressors and generators as far from sensitive receptors as feasibly possible. Erect temporary sound blankets around noisy equipment to mitigate noise propagation.
  - 3. Equip internal combustion engines with a muffler and provide a noise enclosure around stationary equipment such as engine-driven generators, welders, compressors, and pumps. Use “quiet package” and “hush” equipment.
  - 4. Do not start-up machines or equipment prior to or after the specified construction work hours.
- C. Noise Complaints: Should a specific noise impact complaint occur, Engineer has the prerogative to direct Contractor to implement one of the following noise mitigation measures at Contractor’s expense:
  - 1. Relocate stationary construction equipment away from the affected property.
  - 2. Shut off idling equipment.
  - 3. Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
  - 4. Install temporary or portable acoustic barriers around stationary construction noise sources.
  - 5. Operate electric powered equipment using utility power.
- D. Amplified sounds such as telephone, loudspeakers, and other forms of loud communication that constitute a nuisance and potential disturbance shall not be used.

#### 1.09 DIRT AND MUD CONTROL

- A. Contractor is responsible for preventing dirt, mud, and debris from accumulating on streets, sidewalks, parking areas, or other paved surfaces and for maintaining the cleanliness of these areas.
  - 1. Track Out: Clean vehicle tires of mud and dirt before exiting the site.

2. Cover all dump truck loads and other loads that may result in debris falling from the vehicle.
3. Sweeping Paved Areas:
  - a. Maintain cleanliness of paved areas used by the Contractor for the duration of the project.
  - b. Sweep paved areas that have been used since the previous cleaning on at least a weekly basis, or more frequently when directed by the Engineer. Utilize regenerative air or vacuum pickup sweepers together with proper dust control methods to remove sediment, dust, dirt, and other matter from paved areas. Do not use excessive water resulting in mud on public streets.

#### 1.10 TREE AND PLANT PROTECTION

##### A. Temporary tree protection

1. A single 10-inch diameter tree may be removed and only up to 15% of the live tree canopy may be trimmed for the Highway 101 receiving pit within Caltrans right-of-way as shown in the Caltrans encroachment permit.
2. For all other trees within the Project, carefully protect existing trees from damage by construction activities. Additional requirements for specific trees may be shown on the Plans or designated in the Contract Documents.
3. Every reasonable effort shall be made to avoid creating conditions adverse to the tree's health.
  - a. The natural ground within the dripline of protected trees shall remain undisturbed.
  - b. The dripline area of protected trees shall be identified on the ground by a circle with a radius measurement from the trunk of the tree to the tip of its longest limb.
  - c. No limb shall be cut back in order to change the dripline measurement.
  - d. The area within the dripline is a critical area of the tree's root zone and defines the minimum protected area of each tree.
  - e. No vehicles, construction equipment, temporary buildings, supplies, materials or facilities shall be driven, parked, stockpiled or located within the dripline of protected trees.
  - f. No trees outside the construction limits shall be removed or damaged, unless authorized by the Engineer.
4. 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 Engineer. Where it is necessary to replace a tree damaged by construction, the Contractor shall bear all expenses required to establish the replacement tree and pay any tree removal fees.

##### B. Cultivated areas and other surface improvements:

1. Landscaped areas and other surface improvements which are damaged by actions of the Contractor shall be restored.

2. Minimize vegetation removal.
  3. Areas shall not be cleared until construction activities require the work.
  4. Erosion controls shall be in place prior to clearing and grading activities.
- C. Other areas to be protected:
1. Environmentally sensitive areas are indicated on the Drawings.
  2. Erect a protective fence around the area to be protected.
    - a. The protective fence shall be 4 feet tall, international orange high density polyethylene resin (Visi-Barrier or equal).
    - b. Posts shall be heavy duty steel T-posts with corrosion resistant coating spaced at 5 feet on centers.

#### 1.11 OIL SPILL PROTECTION AND CONTROL

- A. Store fuel and oil in accordance with requirements of the Uniform Fire Code and applicable National Fire Protection Association standards.
- B. Assume responsibility for the prevention, containment, and cleanup of spilled oil, fuel, and other petroleum products used in the Contractor's operations. Prevention, containment and cleanup costs shall be borne by the Contractor.
- C. Periodically inspect fuel hoses, lubricating equipment, hydraulically operated equipment, oil drums, and other devices for drips, leaks or signs of damage. Maintain and properly store to prevent spills and vandalism.
- D. Construct dikes around storage tanks, or locate tanks to prevent spills from escaping to surface waters or drainage ditches.
- E. Remove oils on land using sand, clay, sawdust or other absorbent material and dispose in an acceptable manner. Store waste materials in drums or other leak proof containers after cleanup and during transport to disposal.

#### 1.12 WATER POLLUTION CONTROL

- A. Divert sanitary sewage and non-storm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.
- B. Prior to commencing excavation and construction, obtain Engineer's agreement with detailed plans showing procedures intended to handle and dispose of sewage, groundwater, and stormwater flow, including dewatering pump discharges.
- C. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.

#### 1.13 EROSION, SEDIMENT, AND FLOOD CONTROL

- A. Provide, maintain, and operate temporary facilities to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

- B. Comply with state and local requirements.
- C. Comply with Section 02241 and Section 01570.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01570**  
**STORM WATER QUALITY CONTROLS**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Requirements for the compliance with the General Permit for Discharges of Storm Water Associated with Construction Activity in the State of California.

1.02 REQUIREMENTS

- A. The Discharger shall obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2022-0057-DWQ adopted on September 8, 2022. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, excavation and demolition.
- B. The appropriate Regional Water Quality Control Board (RWQCB) enforces the General Permit. Coverage under a General Permit requires the electronic filing of all Permit Registration Documents (PRDs), Notice of Intent (NOI), Notice of Termination (NOT), changes of information, annual reporting and other compliance documents through the State Water Board's Storm water Multi-Application and Report Tracking System (SMARTS) website.
- C. Construction activity includes, but is not limited to: clearing, grading, demolition, 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 receiving waters.
- D. Dewatering Requirements
  - 1. Dischargers with dewatering activities not subject to a separate NPDES permit must comply with the requirements in Attachment J to the General Permit.
- E. While the City is the Discharger and will be responsible to the RWQCB for compliance with the permit, the City will require the Contractor to provide the detailed planning and compliance activities required insofar as they would potentially affect the Contractor's methods and means of performing the Work.
- F. 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.
- G. Information on the Construction General Permit is available on the SWRCB website at: [https://www.waterboards.ca.gov/water\\_issues/programs/stormwater/construction.html](https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html).

1.03 RESPONSIBILITIES

- A. City's Responsibilities
  - 1. City is the Discharger as defined in the General Permit.

2. A City staff person will be designated the Legally Responsible Person (LRP) who will electronically certify Permit Registration Documents (PRDs) prior to commencement of construction activity.
  3. PRDs will be certified by the City after preparation from the Contractor. PRDs consist of:
    - a. Notice of Intent (NOI)
    - b. Risk Assessment
    - c. Site Map
    - d. Storm Water Pollution Prevention Plan (SWPPP)
    - e. Applicable plans, calculations, and other supporting documentation for compliance with existing permitted Phase I or Phase II Municipal Separate Storm Sewer System (MS4) post-construction requirements including attachment or web-source containing the applicable Phase I or Phase II MS4 permittee's post-construction requirements, or the post-construction standards of the General Permit. [not required for LUP projects]
    - f. Annual Fee
    - g. Signed Certification Statement
  4. A City staff person will be the Legally Responsible Person (LRP) who will electronically certify the following documents which may be prepared by others:
    - a. Notices of Termination (NOT)
    - b. Changes of Information
    - c. Annual Reporting
    - d. Other Compliance Documents
  5. City will pay fees associated with filing NOI and annual reports.
  6. City will furnish the Contractor with base maps of a suitable scale in order to prepare required documents.
- B. Contractor's Responsibilities**
1. Do not start ground disturbing activities until project is in receipt of the W DID number generated by SMARTS.
  2. Comply with the SWRCB, RWQCB, County, City and other local agency requirements regarding stormwater management, inspection and monitoring.
  3. Be responsible for meeting the requirements of the General Permit except as specifically noted otherwise herein.
  4. Submit all documents and reports in electronic format suitable to upload to the SMARTS website.
  5. Prepare a SWPPP and submit the SWPPP for City review at least 30 days prior to any soil disturbing construction. The SWPPP shall meet the following requirements:
    - a. SWPPP shall be prepared by a Qualified SWPPP Developer (QSD) as defined in Section V.F. of the General Permit.

- b. The SWPPP and each amendment to the SWPPP must be signed by the QSD.
- c. The City has preliminarily determined the project is Risk Level 1. Final determination will be by the QSD. SWPPP shall meet all the requirements for final determined Risk Level
- d. SWPPP shall meet the requirements of Section IV.O. of the General Permit and include:
  - 1) Identification of all pollutants, their sources, and control mechanisms, including sources of sediment associated with all construction activities
  - 2) Pollutant source assessments, including a list of potential pollutant sources and identification of site areas where additional BMPs are necessary to reduce or prevent pollutants in stormwater and authorized non-stormwater discharges
  - 3) Description of site-specific BMPs implemented to reduce or eliminate stormwater pollution
  - 4) Site-specific BMPs initialized immediately to temporarily stabilize an area disturbed by construction where construction activities will not be resumed within 14 days
  - 5) Identification, elimination, control, or treatment information for all non-stormwater discharges from the site not regulated by this or another NPDES permit
  - 6) Description of efforts and BMPs used to minimize and control pollutants discharged from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be captured and properly disposed of and/or treated to mitigate impacts to water quality
  - 7) Description of efforts and BMPs used to minimize exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater
  - 8) Description of spill and leak prevention and response plan
  - 9) Construction Site Monitoring Program that describes methods and procedures for monitoring discharges that includes the following:
    - a) Visual inspection locations, inspection procedures, and follow-up tracking procedures.
    - b) Applicable sampling locations, collection, and handling procedures.
    - c) Copy of the Chain of Custody form
    - d) Identification of the analytical methods and related method detection limits.
    - e) Watershed monitoring option if applicable.

- 10) Title Sheet Drawings with:
  - a) Project name
  - b) Project location (vicinity map)
  - c) Preliminary schedule of activities; Site operating hours (hours when construction activities are occurring)
  - d) Index of attachments (Drawings)
  - e) Contact information for QSD(s), QSP(s), and trained delegates (name, phone numbers, license, or certification number)
  - f) Signature of the QSD(s) who prepared the SWPPP.
- 11) Pre-Earthwork Drawings with:
  - a) Site and project boundaries
  - b) Areas disturbed during geotechnical or other preconstruction investigation work
  - c) Existing roads and trails
  - d) Drainage areas
  - e) Discharge locations
  - f) Existing storm drain system if applicable
  - g) Proposed locations of storage areas for waste, construction materials, project staging areas, stockpiles, vehicles, equipment and vehicle maintenance, loading/unloading of materials, site access (entrance/exits), fueling, water storage, water transfer for dust control, demolition, and areas of other construction support activities.
- 12) Construction and Earthwork Drawing(s) with:
  - a) Site layout (grading plans) including roads
  - b) Site and project boundaries
  - c) Drainage areas
  - d) Discharge locations
  - e) Sampling locations
  - f) Areas of soil disturbance (temporary or permanent)
  - g) Proposed active areas of soil disturbance (cut or fill)
  - h) Proposed locations of erosion control BMPs
  - i) Proposed locations of sediment control BMPs
  - j) Proposed locations of run-off BMPs
  - k) Temporary and/or permanent run-on conveyance (if applicable)
  - l) Proposed locations of active treatment systems(s) (if applicable)
  - m) Locations of storage areas for waste, construction materials, project staging areas, stockpiles, vehicles,

equipment and vehicle maintenance, loading/unloading of materials, site access (entrance/exits), fueling, water storage, water transfer for dust control, demolition, and areas of other construction support activities; and

- n) Site-specific procedures to implement final stabilization BMPs as soon as reasonably practicable.
6. Provide City with updates to construction start and end dates for City to update in SMARTS system.
  7. Make the SWPPP available at the site and make available upon request by a federal, State, or municipal inspector. A current copy of the site-specific SWPPP and any site inspection reports required by this General Permit may be kept in electronic format at the site so long as the information requested by a federal, State, or municipal inspector can be made available during an inspection. All maps must be legible and available in hard copy at the site.
  8. Designate a Qualified SWPPP Developer (QSD)
    - a. Retain QSD from the beginning of the project through the Notice of Termination approval.
    - b. QSD to complete the NOI in SMARTS for review and certification by the City
    - c. QSD is required to revise the SWPPP to address potential problems identified by visual inspections, sampling data, comments from a QSP, or their own site observations.
    - d. QSD to update the SWPPP with the name, email, and phone number of all the QSP-trained delegate(s)
    - e. QSD to perform the following mandatory on-site visual inspections
      - 1) Within 30 days of construction activities commencing on a site.
      - 2) Within 30 days of replacing a previous QSD.
      - 3) Twice annually, once August through October and once January through March.
      - 4) Within 14 calendar days after a numeric action level exceedance.
      - 5) Within the time period requested in writing from Water Board staff.
  9. Designate a Qualified SWPPP Practitioner (QSP)
    - a. QSP is required to review work performed by trained delegates including visual inspections, sampling, BMP implementation activities, and other required tasks listed in the SWPPP.
    - b. QSP to perform the following mandatory on-site visual inspections
      - 1) Once every calendar month
      - 2) Within 72 hours prior to a forecasted Qualifying Precipitation Event to inspect areas of concern to verify the status of any deficiencies, BMPs, or other identified issues at the site. If extended forecast precipitation data (greater than 72 hours) is available from the National Weather Service, the pre-

- precipitation event inspection may be done up to 120 hours in advance.
- 3) Within 14 days after a numeric action level exceedance to inspect the drainage area of the exceedance and document any areas of concern.
  - 4) Prior to the submittal of General Permit Notice of Termination or a Change of Information for acreage changes.
- c. QSP to verify the following
- 1) All BMPs required in the SWPPP are implemented, correctly installed, inspected, and maintained
  - 2) Track out of construction related material at site entrances and exits is controlled
  - 3) The SMARTS generated WDID number notification form is posted in a location viewable by the public or readily available upon request, kept up to date, and the start and end dates are correct and match the dates listed in SMARTS for the project
  - 4) Sampling protocols for stormwater and non-stormwater discharges are correctly performed as described in the SWPPP by on-site trained personnel delegated by a QSP
  - 5) Correct contact information including name, phone number and email address for the discharger, Legally Responsible Person, QSD(s) and QSP(s) is included in the SMARTS system within 90 days of a change
  - 6) Photo documentation is included in the SWPPP of problem areas of erosion, new sediment deposition, unauthorized non-stormwater discharges, and/or failed BMPs and photos are made available upon a regulatory inspector's request.
10. Ensure the following for QSP-delegates
    - a. QSP has determined the delegate(s) can perform and have a competent understanding of the visual inspection, sampling and/or SWPPP and BMP implementation task prior to fully delegating the responsibility to the individuals.
    - b. All current delegates(s), including name, email and phone number, are maintained in a training log, uploaded as an attachment to the SWPPP in SMARTS, prior to the delegate performing the delegated function.
    - c. Delegate(s) have a system used to record and report issues back to the QSP within 24 hours of when a corrective action is needed.
  11. Install, construct, implement, monitor, maintain and remove upon completion all of the BMPs and other pollution prevention measures.
  12. Implement the Construction Site Monitoring Program (CSMP) developed in the SWPPP for the specific Risk Level of the project. Retain records of all monitoring information and copies of all reports and submit to the City.
  13. Submit to the SMARTS system all reporting required by the General Permit including but not limited to:

- a. Sampling results within 30 days of the precipitation event completion or within 10 days if the sampling results demonstrate the exceedance of the pH and/or turbidity Numeric Action Levels (NAL).
  - b. Numeric Action Level Exceedance Report when requested, in writing, from a Regional Water Board delegate.
  - c. Receiving water sample results within 10 days of precipitation event.
  - d. Non-visible pollutant field and/or analytical sampling results within 30 days after obtaining results or within 10 days if the analytical result demonstrate the exceedance of an applicable TMDL-related NAL.
  - e. Reporting shall be made available to the City for review at least 5 days prior to the State’s reporting deadlines listed above.
14. Prepare the annual compliance report and submit to the City 15 days prior to September 1 of each year. Annual report shall comply with the requirements of Section IV.P. – Annual Reporting Requirements of the General Permit including but not limited to:
- a. Summary of all stormwater sampling and monitoring reports and supporting documents
  - b. Summary of all corrective actions taken during the compliance year.
  - c. Identification and explanation of any compliance activities or corrective actions that were not taken.
  - d. Summary of all General Permit violations
  - e. Names of individual(s) who performed the site inspections, sampling, visual inspections, and/or measurements, including the amount of precipitation measured in inches
  - f. All visual inspection and sample collection exception records and reports.
15. Contractor shall be bound to the conditions on the Notice of Intent (NOI) that will be certified by the City and will be responsible for all costs associated with the implementation of the Plan including all fines, damages and job delays incurred due to failure to implement the requirements of the General Permit.
16. Notify the Engineer immediately following a request from any regulatory agency to enter, inspect, sample, monitor or otherwise access the Project Site or its records.
17. Take the proper actions to prevent stormwater coming into contact with contaminants and sediments from migrating offsite or entering storm sewer drainage systems. Take immediate action if directed by the Engineer or if the Contractor observes contaminants and/or sediments entering the storm drainage system, to prevent further stormwater from entering the system.
18. Provide information and certification as necessary to complete the NOT including
- a. Completed NOT in SMARTS
  - b. QSP-prepared final Notice of Termination inspection with the QSP name and valid QSP certificate number
  - c. Final site map

- d. Photos demonstrating final stabilization and the implementation of applicable post-construction BMPs and/or low impact development.
- e. Only biodegradable wattles containing no plastic can remain on a site applying for a NOT. Wattles containing plastic netting (including plastic specified as photo-degradable) are considered “construction materials and waste” by the State and must be disposed of.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01600**  
**MATERIALS AND EQUIPMENT**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Materials, equipment and products incorporated into the work.

1.02 MATERIAL AND EQUIPMENT REQUIREMENTS

- A. Specified in individual specification Sections in Divisions 2 through 15.
- B. Specifications are minimum requirements and manufacturers' standard products may require modifications to meet the specified requirements.
- C. Provide products and equipment with all accessories, trim, finish, safety guards and other devices needed for a complete and operational installation.
- D. Products to be supplied in quantity shall be the same product from a single source to provide standardization and interchangeability.

1.03 DEFINITIONS

- A. Named Products: Items identified by manufacturer's product name and model number as indicated in the manufacturer's published product data.
- B. Materials: Products that are shaped, cut, worked, finished or otherwise fabricated or installed to form a part of the Work.
- C. Equipment: A product with working parts, whether motorized or manually operated, that requires connections such as wiring or piping.

1.04 PACKAGING AND MARKING

- A. Equipment shall be protected against damage from moisture, dust, handling, or other cause during transport from manufacturer's premises to site. Each item or package shall be marked with the number unique to the specification reference covering the item.
- B. Stiffeners shall be used where necessary to maintain shapes and to give rigidity. Parts of equipment shall be delivered in assembled or sub-assembled units where possible.
- C. Bearing housings, vents and other types of openings shall be wrapped or otherwise sealed to prevent contamination by dust and dirt.

1.05 SHIPPING AND DELIVERY

- A. Plan, order, coordinate and deliver materials and equipment in accordance with the construction schedule to avoid delays and conflicts with the Work.
- B. Deliver anchor bolts and bolt templates sufficiently early to permit setting and placement in structural concrete.
- C. Unload products in accordance with the manufacturer's handling instructions. Promptly inspect for completeness and evidence of damage during shipment.

## 1.06 HANDLING AND STORAGE

- A. During the interval between the delivery of equipment to the site and installation, all equipment, unless otherwise specified, shall be stored in an enclosed space affording protection from weather, dust and mechanical damage and providing favorable temperature, humidity and ventilation conditions to ensure against equipment deterioration. Manufacturer's recommendations shall be adhered to in addition to these requirements.
- B. Equipment and materials to be located outdoors may be stored outdoors if protected against moisture condensation. Equipment shall be stored at least 6 inches above ground. Temporary power shall be provided to energize space heaters or other heat sources for control of moisture condensation. Space heaters or other heat sources shall be energized without disturbing the sealed enclosure.
- C. Fabricated products, pipe and pipe appurtenances shall be handled, stored off the ground on blocking or skids. Pipes with paint, tape coatings, linings or the like shall be stored to protect the coating or lining from physical damage or other deterioration. Pipes shipped with interior bracing shall have the bracing removed only when recommended by the pipe manufacturer.
- D. Store loose granular products in well-drained area on a solid surface to prevent mixing with foreign matter. Cover products that are subject to erosion or deterioration with plastic sheeting.
- E. Store electrical, instrumentation and control products in a water-tight enclosure to protect against damage from moisture, dust and corrosion.

## 1.07 PROTECTION OF EQUIPMENT AFTER INSTALLATION

- A. After installation, protect equipment from damage from, including but not limited to, dust, abrasive particles, debris and dirt generated by the placement, chipping, sandblasting, cutting, finishing and grinding of new or existing concrete, terrazzo and metal; and from the fumes, particulate matter, and splatter from welding, brazing and painting of new or existing piping and equipment.
- B. As a minimum, vacuum cleaning, blowers with filters, protective shielding, and other dust suppression methods will be required at all times to adequately protect all equipment.
- C. When sandblasting or when finishing concrete, all equipment that may be affected by cement dust shall be completely covered. Electrical switchgear, substations and motor load centers shall not be installed until after all concrete work and sandblasting in those areas have been completed and accepted and the ventilation systems installed.
- D. During painting operations, all grease fittings and similar openings shall be covered to prevent the entry of paint.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### 3.01 INSPECTION

- A. Prior to installation, inspect materials and equipment for signs of corrosion and other effects of storage. Do not install material or equipment showing such effects.

- B. Remove damaged material from the site and expedite delivery of replacement material or equipment. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays that are within the Contractor's control.

3.02 INSTALLATION

- A. Handle, install, connect, clean and adjust products in accordance with the manufacturer's instructions.
- B. Fill lubricant reservoirs and grease bearings prior to starting equipment. Use lubricants recommended by the manufacturer of the equipment.
- C. Recoat painted surfaces that are damaged prior to final acceptance of the Work.

**END OF SECTION**

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**SECTION 01780**  
**RECORD DRAWINGS**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Record Drawings are documents maintained and annotated by the Contractor during construction to illustrate the final location of piping, equipment, electrical conduits, outlet boxes and cables.
- B. Record changes or deviations that vary from the details indicated on the original Contract Documents. Identify buried or concealed construction and utility features that are revealed during the course of construction. Record the horizontal and vertical location of buried utilities that differ from the locations indicated, or which were not indicated on the Contract Documents.
- C. When the configuration and arrangement of the Work is changed from that indicated on the Contract Drawings or specified in the Project Manual, the authorizing document for the change, such as a Request for Information, Change Order, Shop Drawing, or Field Order, shall be clearly referenced on the Record Drawings as a comment.
- D. Supplement the Record Drawings with detailed layout sketches, schedules, installation drawings and fabrication drawings.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

3.01 RECORD DRAWINGS

- A. Record Drawings shall be full size and maintained in a clean and legible condition. Engineer will provide one set of full size Drawings for use as a Record Drawing set.
- B. Do not use the Record Drawing set for construction purposes.
- C. At the completion of the work, but prior to final payment, submit the Record Drawing set to the Engineer.
- D. Marking of the drawings shall be kept current and shall be done at the time the material and equipment are installed.
- E. Annotations to the Record Drawings shall be legible and shall be made with an erasable colored pencil conforming to the following color code:
  - 1. Additions and Final Dimensions – Red
  - 2. Deletions – Green
  - 3. Comments – Blue
- F. Engineer will review the Contractor's updated Record Drawing mark-ups on a monthly basis during the evaluation of each progress payment.
  - 1. Progress payment approval is contingent upon complete and up-to-date Record Drawing mark-ups.

2. Payment approval will be delayed if mark-up drawings are not up-to-date.

**END OF SECTION**

**SECTION 01890**  
**RESTORATION OF IMPROVEMENTS**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Restoration of work areas after installation and construction of new facilities.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
  - 1. Section 02953 –Pavement Restoration

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

3.01 STRUCTURES

- A. Take precautions to protect the integrity and usefulness of existing facilities.
- B. If necessary, remove existing structures including curbs, gutters, pipelines, and utility poles, as necessary for the performance of the work.
  - 1. Repair existing structures that are damaged as a result of the Work under this contract
  - 2. Rebuild or replace the structures in as good a condition as originally found.

3.02 ROADS AND STREETS

- A. Asphalt pavement that has been removed, broken, or damaged, or in which the ground has caved or settled during the work under this contract, shall be brought to original grade and section, resurfaced, and restriped.
- B. Before resurfacing material is placed, sawcut edges of pavement to provide clean solid vertical faces.
- C. Complete pavement repair in accordance with Section 02953 and in accordance with the requirements of the affected agencies and parties.

3.03 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS

- A. Restore cultivated or planted areas and other surface improvements damaged by construction as nearly as possible to their original condition.
- B. Repair existing guard posts, barricades, and fences that are damaged.
- C. Replace damaged plantings with new plantings of the same type or as acceptable to the Owner

3.04 PROTECTION OF EXISTING INSTALLATIONS

- A. Immediately repair or replace existing equipment, controls, structures, or facilities which are damaged as part of the Work.

- B. Take measures that are necessary to ensure that construction debris and materials are kept out of the wastewater system.

**END OF SECTION**

## SECTION 01999

### REFERENCE FORMS

The forms listed below and included in this section are referenced from other sections of the project manual. Contractor may submit equivalent forms for Engineer's approval prior to use. If Engineer does not approve substitute form, Contractor shall use forms found in this Section. Engineer will provide Contractor electronic files of prescribed forms upon request.

<b>Referenced In Section</b>	<b>Title of Form</b>
15996	Pipe Test Record Form
01330	Proposed "Or Equal" Substitution Transmittal
01340	Request for Information (RFI)
01330	Submittal Transmittal
01140	System Outage Request

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# PIPE TEST RECORD

Date: \_\_\_\_\_

Project Name: \_\_\_\_\_ Project No.: \_\_\_\_\_

Contractor: \_\_\_\_\_

Pipeline Size & Name	Pipe Type	Pipe Location/Description
(SL), SN, IA, etc.)	(DI, PVC, Steel, Copper, etc.)	(Attach sketch if needed)
<b>Section Tested:</b> From: _____ To: _____	<b>First Test</b> <input type="checkbox"/> Or <b>Re-Test</b> <input type="checkbox"/>	<b>Length of Pipe Tested:</b> _____ Ft.

Test Specifications	Actual Test Results
Type of Test: _____	Start pressure: _____
Specified Test Pressure: _____	End Pressure: _____
Duration: _____	Start time _____ Stop time _____ Duration _____
Allowable loss: _____	Actual loss: _____

**Comments:**

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<b>Test Passes</b>	<input type="checkbox"/>
<b>Test Fails</b>	<input type="checkbox"/>

**Tested By:** \_\_\_\_\_  
Contractor

**Test Witnessed By:** \_\_\_\_\_  
Construction Inspector

## PROPOSED "OR EQUAL" SUBSTITUTION SUBMITTAL TRANSMITTAL

**Proposed "Or Equal Substitution Submittal Description**

\_\_\_\_\_

\_\_\_\_\_

Priority Level:  Low     Medium     High     **On Critical Path**

<b>Submittal No.</b>	
<input type="checkbox"/> 1st Submission	<input type="checkbox"/> Re-Submittal
Spec Section	
Dwg/Detail No.	

	Routing	Date Sent	Date Received
Owner:			
Project Name:	Contractor/CM		
	CM/Design Consultant		
Contractor:	Design Consultant/CM		
	CM/Contractor		

**Proposed "Or Equal" Substitution Item or Service**

- A. When the first specified item is followed by a second maker's name and "or equal," the Contractor may submit Proposed Equivalent items for the Engineer's review. Proposed "Or Equal" Substitution items that are in the Engineer's judgment equal to the first specified item in quality, utility, and appearance, will be Favorably Reviewed. Where a product description and first maker's name is followed by "or equal" with no second maker's name, it means the Engineer knows of no equivalent product and the Contractor may submit Proposed Equivalent products by other makers for review. Where the term "or equal" is omitted, it means that the named item is required to meet the Owner's needs; no products or makers other than those specified will be considered.
  
- B. This request shall include adequate technical information to fully describe the function and quality of the item. Submittals of Proposed "Or Equal" Substitution items that are not made within thirty (30) calendar days of the Notice to Proceed date will be rejected unless the Owner has agreed in writing to a later submittal date and the Contractor agrees to comply with all conditions of the Owner for the late submittal. If the Contractor's second attempt to obtain Favorable Review of a Proposed "Or Equal" Substitution item is unsuccessful, the Contractor shall submit the first specified item.
  
- C. Inclusion of a second maker's name indicates the maker is acceptable but does not necessarily indicate the maker offers a standard product equal to the first specified item. Items by the second named maker are subject to the same conditions of review and compatibility as other Proposed "Or Equal" Substitution items. Inclusion of a maker's name and/or model number after a specification description is not a representation that the maker will furnish an item meeting the Contract requirements at bid time or at time of need. It is the Contractor's sole responsibility to furnish items meeting the Contract requirements.
  
- D. The Engineer's review of Proposed "Or Equal" Substitution items is based solely on information provided by the Contractor and on the Contractor's warranty that the proposed item is equal in quality, utility, function and appearance to the first specified item. Favorable Review of a Proposed "Or Equal" Substitution item has the same meaning and is subject to the same limitations that apply to the Favorable Review of Product Data and Shop Drawings described in the Contract Documents.
  
- E. Submit with proposal:
  - 1. Description of item being proposed including the Manufacturer's model or product number.
  - 2. Manufacturer's representation that the proposed "or equal" substitution item or service is equal to or superior to specified item in all respects.
  - 3. Manufacturer's product data.
  - 4. Information about several recent similar installations, including project name, owner's name, address, telephone number, and name of knowledgeable person to contact for information on performance of the product.

5. Whether a reduction in the Contract Price is being proposed. If so, provide a detailed cost breakdown substantiating the cost reduction. Consideration should be given to all extra costs and expenses necessary to make the proposed "or equal" substitution meet or exceed the all requirements found in the Contract Documents.
6. Whether a reduction in the Contract Time is being proposed. If so, provide schedule analysis substantiating the reduction in contract time and assumptions made in the schedule analysis.
7. Explain all known differences between the product specified and the Proposed "Or Equal" Substitution. Explanation to consider such items as:
  - a) Does the substitution affect dimensions shown on Drawings?
  - b) Are the manufacturer's guarantees and warranties on the proposed substitution items identical to those on the specified items? If there are differences, please specify each and every difference in detail.
  - c) Does the proposed "or equal" substitution impact other contractors, trades or suppliers?
  - d) Is the proposed "or equal" substitution compatible with all other interrelated equipment, materials and products?
  - e) Any differences in Operations and Maintenance costs?
  - f) Any differences in available factory authorized repair centers with regards to response times and geographic location?
  - g) Will use of proposed "or equal" substitution be subject to any license fee or royalty?
  - h) Are there any color or pattern differences? If so, provide color and pattern samples?

The undersigned hereby:

1. Certifies that he/she has thoroughly investigated the Proposed "Or Equal" Substitution item or service and has determined that the function/utility, appearance and quality of the Proposed "Or Equal" Substitution item or service are equivalent or superior to those of the specified item;
2. Certifies that the Proposed "Or Equal" Substitution item or service is compatible with all interrelated equipment, materials, products and services unless otherwise explained in specific detail in this submittal;
3. Agrees to coordinate installation and make all other changes that may be required for Work to be complete in all respects at no additional cost to the Owner;
4. Waives all claims for additional costs and contract time due to late ordering of the specified products or services caused by requests for "Or Equal" Substitutions that are subsequently rejected by the Engineer;
5. Represents and warrants that the Contractor is solely responsible for any extra cost or expense necessary to make the Proposed "Or Equal" Substitution item or service fully equivalent to and compatible with the Contract Documents and will meet or exceed the Engineer's design intent;
6. Agrees to compensate the Owner for all additional redesign costs associated with the Proposed "Or Equal" Substitution item or service and the cost of the Engineer's review of the Proposed "Or Equal" Substitution item or service;
7. Waives all claims for additional costs and contract time which may subsequently become apparent; and
8. Agrees to comply with all additional requirements imposed by the Owner and Engineer should the Proposed "Or Equal" Substitution item or service is approved.

Submitted by: \_\_\_\_\_

Contractor: \_\_\_\_\_

Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_

Date: \_\_\_\_\_

# REQUEST FOR INFORMATION

RFI No.: XXX

Owner: \_\_\_\_\_

Project: \_\_\_\_\_

Contractor: \_\_\_\_\_ Engineer \_\_\_\_\_

RFI Generated by:  Contractor  CM  Other

Priority Level:  Low  High  On Critical Path

Is there a Cost Impact associated with this RFI?  Yes  No  Possibly

Is there a Time Impact associated with this RFI?  Yes  No  Possibly

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**RFI Title:**

Reference: Spec: \_\_\_\_\_ Sheet: \_\_\_\_\_

**Requested Information:**

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

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**Response:**

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

## SUBMITTAL TRANSMITTAL

Submittal Description \_\_\_\_\_

Priority Level:  Low     Medium     High     On Critical Path

<b>Submittal No.</b>	
<input type="checkbox"/> 1st Submission	<input type="checkbox"/> Re-Submittal
Spec Section	
Dwg/Detail No.	

Owner:	Routing	Date Sent	Date Received
Project Name:	Contractor/CM		
	CM/Design Consultant		
Contractor:	Design Consultant/CM		
	CM/Contractor		

We are sending you:     Attached                       Under separate cover via \_\_\_\_\_  
 Submittals for review and comment  
 Product Data for information only \_\_\_\_\_

No. Copies	Description	Manufacturer	Reviewer Action	Reviewer Initials

<p>The Action Designated Above is in Accordance with the Following Legend:</p> <p>A – No Exceptions Taken          B – Make Corrections Noted          C – Amend and Resubmit          D – Rejected          E – Review not Required</p>	<p><b>CONTRACTOR:</b> Must certify one of the following statements pertaining to the transmittal or submittal sent for review:</p> <p><input type="checkbox"/> As the General Contractor for this project we certify that the material or equipment contained in this submittal meets all the requirements, including coordination with all related work specified (no exceptions)</p> <p><input type="checkbox"/> As the General Contractor for this project we certify that the material or equipment contained in this submittal meets all the requirements specified except for the attached deviations.</p>
--	--

Comments:

Certified by: \_\_\_\_\_  
 (Contractor's Signature)

## SYSTEM OUTAGE REQUEST FORM

**System to be Shutdown:** \_\_\_\_\_

**SOR No.:** \_\_\_\_\_

Date of Shutdown: \_\_\_\_\_ Beginning at: \_\_\_\_\_ am/pm

Duration of Shutdown: \_\_\_\_\_ Critical Path Activity?  yes  no

Owner:		<b>Routing</b>	<b>Date Sent</b>	<b>Date Received</b>
Project:		Contractor/CM		
Contractor:		CM/Owner-Operations		
Regulatory Agency Notification Required? <input type="checkbox"/> yes <input type="checkbox"/> no      Is a Dry Run Required? <input type="checkbox"/> yes <input type="checkbox"/> no Combustible/Hazardous Gases Present? <input type="checkbox"/> yes <input type="checkbox"/> no      Confined Space Entry? <input type="checkbox"/> yes <input type="checkbox"/> no				
Describe work to be performed including detailed sequence of events, safety plan, protection of existing facilities, equipment to be used and contingency plan. Use additional sheets as necessary.				
Will you require assistance from Owner Operations? <input type="checkbox"/> yes <input type="checkbox"/> no Note: <i>Existing valves and controls shall be operated by Owner staff only</i>				
<b>Outage Contact Information</b>	<b>Name of Person on Call/Duty</b>	<b>Home Phone</b>	<b>Cell Phone</b>	
Contractor				
Construction Manager				
Owner Operations				
Design Consultant				
Additional Contractor Comments:		<b>CM / Owner / Design Consultant Review Action</b>  <input type="checkbox"/> SOR Acceptable with comments noted on attached.  <input type="checkbox"/> SOR Not Acceptable with reasons noted on attached. Re-Submittal is required.		
Certified by: _____ (Contractor's Signature)		_____ (Construction Manager's Signature)		_____ Date

**SECTION 02071**  
**GEOTEXTILE FABRIC**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Geotextile fabric.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
  - 1. Section 01330 – Submittals

1.03 SUBMITTALS

- A. Comply with Section 01330.
- B. Manufacturer's Data:
  - 1. Manufacturer's name and product information
  - 2. Certificate of Compliance
  - 3. Minimum Average Roll Values (MARV)

1.04 DEFINITIONS

- A. Geosynthetic – A planar product manufactured from polymeric material used with soil, aggregate, or other geotechnical engineering materials as an integral part of a civil engineering project.
- B. Geotextile – a permeable geosynthetic comprised solely of textile materials (nonwoven or woven comprised of various synthetic polymers and manufactured by numerous processes).

1.05 FUNCTION

- A. Filter Fabric:
  - 1. Used for subsurface drainage applications including retaining walls, trench drains and seepage control.
  - 2. Allows water to flow through the geotextile while retaining soil particles. Filter must perform for the life of the drainage system by resisting clogging.
- B. Rock Slope Protection Fabric:
  - 1. Provides protection from erosion and scour when used in conjunction with rock rip rap. Provides separation between earth and rock.
- C. Subgrade Enhancement Geotextile:
  - 1. Located beneath aggregate base of both paved and unpaved roadways. Used as solids separation barrier for below grade structures.

1.06 QUALITY ASSURANCE

- A. Treat geotextiles to resist degradation from exposure to sunlight.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver, unload, and store geotextile fabric in manufacturer's wrapping with a minimum amount of handling.
- B. Protect geotextile rolls from excessive dust, moisture, rainfall, mud, ultraviolet exposure, and debris.
- C. Follow manufacturer's recommendations regarding storage.

**PART 2 - PRODUCTS**

2.01 MANUFACTURERS

- A. One of the following or equal:
  - 1. US Fabrics
  - 2. TenCate Mirafi

2.02 MATERIALS

- A. General
  - 1. Fabric values are based on the State of California Department of Transportation Specifications (Section 96) except for Geomembrane Support Fabric.
- B. Filter Fabric
  - 1. Permeable, nonwoven
  - 2. Polypropylene, polyester or a combination of both
  - 3. When tested under the referenced ASTMs, the properties must have the values shown in the following table.
  - 4. Approved manufacturers
    - a. US Fabrics, US160NW for Class C
    - b. TenCate Mirafi, 160N for Class C

Filter Fabric (Caltrans 96-1.02B)				
Quality Characteristic	Test Method	Values		
		Class A	Class B	Class C
Permittivity (min, sec <sup>-1</sup> )	ASTM D4491	0.5	0.2	0.1
Apparent opening size, average roll value, (max, US standard sieve size)	ASTM D4751	40	60	70
Grab Breaking Load, 1-inch grip, in each direction (min, lb)	ASTM D4632	157		
Apparent elongation, in each direction (min, percent)	ASTM D4632	50		
Puncture strength, (min, lb)	ASTM D6241	310		
Trapezoid tearing strength, (min, lb)	ASTM D4533	56		
UV Resistance retained grab breaking load, 500 hours (min. percent)	ASTM D4355	70		

C. Rock Slope Protection (RSP) Fabric

1. Permeable, nonwoven, needle-punched.
2. Polypropylene, polyester or a combination of both.
3. When tested under the referenced ASTMs, the properties must have the values shown in the following table.
4. Approved manufacturers
  - a. US Fabrics
    - 1) Class 8 – US 225NW
    - 2) Class 10 – US 270NW
  - b. TenCate Mirafi
    - 1) Class 8 – 180NC
    - 2) Class 10 – 1100NC

RSP Fabric (Caltrans 96-1.02I)			
Quality Characteristic	Test Method	Values	
		Class 8	Class 10
Mass (oz/sq yd, min)	ASTM D5261	7.5	9.5
Grab Breaking Load, 1-inch grip in each direction, (min, lb)	ASTM D4632	200	250
Apparent elongation in each direction (min, percent)	ASTM D4632	50	50
Permittivity (min, sec <sup>-1</sup> )	ASTM D4491	1.0	0.70
Apparent opening size (min and max, U.S. Standard sieve size)	ASTM D4751	70-100	70-100
UV Resistance, retained grab breaking load, 500 hours, (min, percent)	ASTM D4355	70	70

D. Subgrade Enhancement Fabric

1. Polyester or polypropylene.
2. When tested under the referenced ASTMs, the properties must have the values shown in the following table.
3. Approved manufacturers
  - a. US Fabrics

Subgrade Enhancement Geotextile (Caltrans 96-1.02O)						
Quality Characteristic	Test Method	Requirement <sup>(a)</sup>				
		Class A1	Class A2	Class B1	Class B2	Class B3
Elongation at break, (percent)	ASTM D4632	<50	≥50	<50	<50	≥50
Grab Breaking Load, 1-inch grip in each direction, (min, lb)	ASTM D4632	250	160	--	320	200

Subgrade Enhancement Geotextile (Caltrans 96-1.020)						
Quality Characteristic	Test Method	Requirement <sup>(a)</sup>				
		Class A1	Class A2	Class B1	Class B2	Class B3
Wide width tensile strength at 5 percent strain, (min, lb/ft)	ASTM D4595	--	--	2,000	--	--
Wide width tensile strength at ultimate strength, (min, lb/ft)	ASTM D4595	--	--	4,800	--	--
Tear strength, (min, lb)	ASTM D4533	90	60	--	120	80
Puncture strength, (min, lb)	ASTM D6241	500	310	620	620	430
Permittivity, (min, sec-1)	ASTM D4491	0.05	0.05	0.20	0.20	0.20
Apparent opening size, (min, inches)	ASTM D4751	0.012	0.012	0.024	0.012	0.012
UV Resistance, retained grab breaking load, 500 hours, (min, percent)	ASTM D4355	70	70	70	70	70
<sup>(a)</sup> Values are based on minimum average roll value in the weaker principal direction except apparent opening size is based on maximum average roll value.						

**PART 3 - EXECUTION**

**3.01 PREPARATION**

- A. Subgrade and earthwork as specified in Section 02320.

**3.02 PLACEMENT**

- A. Roll Length: Sized to fit area of use. Minimum length of 300 feet for areas larger than 300 feet long.
- B. Handle geotextile fabric in a manner that will not damage fabric.
- C. Place geotextile with no wrinkles or folds.
- D. If the fabric is joined with overlap joints, the adjacent borders of the fabric must be overlapped be at least 24-inches. Overlap in the same directions that the cover material is placed.
- E. Install as shown on the Drawings and per manufacturer’s installation instructions.

**END OF SECTION**

**SECTION 02085**  
**PRECAST CONCRETE UTILITY STRUCTURES**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Precast catch basins, utility vaults, meter boxes and electrical hand holes.

1.02 REFERENCED SECTIONS

- A. The following Section is referenced in this Section:
  - 1. Section 01330 – Submittals

1.03 SUBMITTALS

- A. Prepare and submit in accordance with Section 01330.
- B. Product Data:
  - 1. Catch basin sections, basins, tops, frames, and grates.
  - 2. Utility vault access hatches.
  - 3. Hand holes.
  - 4. Accessories for utility vaults.
- C. Utility Structure Details:
  - 1. Manufacturer’s standard shop drawings for each size and type of precast utility structure.
    - a. Provide dimensions of structure.
    - b. Identify location of each type of insert cast into the structure.
  - 2. Illustrate construction details related to joints between precast sections, method of connecting pipe to the structure, size and location of pipe penetrations, reinforcement details and concrete mix design.
- D. Structural Design:
  - 1. Laboratory results verifying compressive strength of concrete mix design used in the manufacture of precast concrete utility structures.
  - 2. Calculations and related sketches prepared, stamped and signed by a civil or structural Professional Engineer licensed to practice in the state of California.

1.04 DESIGN REQUIREMENTS

- A. Concrete Mix Design for products covered by this Section:
  - 1. Minimum Compressive Strength: 4,000 psi at 28 days.
  - 2. Cement: Type II low alkali Portland cement meeting requirements of ASTM C150.
  - 3. Fly Ash: Class C or Class F meeting requirements of ASTM C618, not to exceed 25 percent by weight.
  - 4. Aggregates: Conform to requirements of ASTM C33.

- B. Utility Vaults, Meter Boxes and Electrical Hand Holes:
1. Base design and manufacture to A-16 (HS 20-44) loading with 30 percent impact in accordance with ASTM C857.
  2. Traffic Loads:
    - a. Utility Vaults in Right of Way: H-20 structural load rating according to AASHTO HB 17.
    - b. Utility Vaults in Private Right of Way, Parking Lots and other Off-Roadway Locations: H-20 structural load rating according to AASHTO HB 17.
  3. Earth Loads: Design for lateral earth pressure of 85 pounds per cubic foot and equivalent fluid pressure of 60 pounds per cubic foot applied at a depth of  $\frac{1}{3} H$  below the ground surface where H is the height of the utility vault.
  4. Seismic Loads: Design in accordance with the requirements of the relevant California seismic code and seismic zone.
  5. Buoyancy: Select wall and slab thicknesses to provide sufficient weight against buoyancy due to groundwater elevations.
    - a. Consider groundwater elevation at the ground surface.
    - b. Utilize a safety factor of 1.1.
    - c. Do not take credit for friction forces that may develop between the soil backfill and concrete walls of the utility vault.
  6. Access Hatch and Lid Loading Criteria:
    - a. Access hatches and vault lids H-20 structural load rating according to AASHTO HB 17.

#### 1.05 COORDINATION

- A. Coordinate layout and installation of utility structures with the final arrangement of other utilities, site grading, and surface features as determined in the field.

### **PART 2 - PRODUCTS**

#### 2.01 PRECAST CONCRETE CATCH BASINS AND ELECTRICAL HAND HOLES

- A. Provide precast concrete catch basins, electrical hand holes, drop inlets, curb inlets or other storm drain inlets as indicated on the Drawings.
- B. Manufacturers: One of the following or equal:
1. Oldcastle Precast
  2. Christy Concrete Products.
- C. Description:
1. Factory-fabricated, reinforced concrete box with frame and grate.
  2. Open or integral closed bottom as indicated on the Drawings or as scheduled.
  3. Monolithically poured walls and bottom, unless open-bottom vaults are indicated on the Drawings or scheduled.
  4. Electrical hand holes shall have H20 rated lid stamped "ELECTRIC."

- D. Materials
    - 1. Concrete: 5,000 psi at 28 days
    - 2. Reinforcing steel: ASTM A615 grade 60
    - 3. Mesh: Welded wire fabric ASTM A185 grade 65
  - E. Frame and Grate, and Lid
    - 1. Cast iron or hot dipped galvanized.
- 2.02 PRECAST CONCRETE UTILITY VAULTS AND METER BOXES
- A. Manufacturers: One of the following or equal:
    - 1. Christy Concrete Products.
    - 2. Utility Concrete Products, LLC.
    - 3. Utility Vault Company.
  - B. Description:
    - 1. Factory-fabricated, reinforced concrete vault with cover and accessories.
    - 2. Open or integral closed bottom as indicated on the Drawings or as scheduled.
    - 3. Monolithically poured walls and bottom, unless open-bottom vaults are indicated on the Drawings or scheduled.
  - C. Frame and Cover:
    - 1. Unless access hatches are indicated or specified, fabricate steel frame and cover for utility vault openings.
    - 2. Frame: Galvanized steel or aluminum.
    - 3. Cover: Galvanized steel or aluminum with diamond pattern.
    - 4. Provide 1-inch diameter pick hole for each cover piece unless otherwise indicated.
    - 5. Split cover into pieces such that the maximum weight of each piece is less than 80 pounds.
    - 6. Cover Coating: Powder Coated, Purple in Color (Color to be submitted for approval)
  - D. Access Cover: H-20 traffic rated.

### **PART 3 - EXECUTION**

#### **3.01 MANUFACTURE**

- A. Utilize a central batching facility to ensure accurate weighing and mixing of materials to consistently obtain a suitable concrete mix.
- B. Concrete Batching: Properly proportion sand, aggregate and cement with sufficient water to produce a concrete mix of uniform quality and slump.
- C. Concrete Compaction: Use either external or internal mechanical vibration during placement of the concrete mix within the forms.

- D. Curing: Steam cure concrete while still in the forms and after an initial set has taken place.
  - 1. Steam temperature: Not to exceed 160 degrees F, nor raised from normal ambient temperature at a rate exceeding 40 degrees F per hour.
  - 2. Terminate steam curing after sufficient time has elapsed to produce adequate strength to withstand any structural strain that may occur during the form stripping operation.
  - 3. Additional curing may be applied by means of water spraying or membrane curing compound to reach the ultimate strength requirements.
- E. Reinforcing Steel: Position within the forms as required for design loads. Tie reinforcing steel sufficiently to withstand displacement during the pouring operation.

### 3.02 INSTALLATION

- A. Utility Vaults and Meter Boxes:
  - 1. Comply with ASTM C891.
  - 2. When vaults are provided in sections, install vault sections level and plumb and with orientation and depth coordinated with connecting pipes.
  - 3. Support vault on a level bed of aggregate base material, 12 inches deep and compacted to 95 percent of maximum density.
  - 4. Seal joints with joint sealing compound. Clean joints and apply sealing compound in accordance with the manufacturer's requirements.
  - 5. Covers:
    - a. Install covers to be H-20 traffic rated.
    - b. Install covers and perform necessary cleaning and scraping of foreign materials from frames and covers as necessary to assure proper fit. Replace frames and covers that create noise when passed over by traffic.
  - 6. Finish Elevations of Utility Vaults
    - a. Paved Areas, Roadway Shoulders and Other Areas of Vehicular Traffic: Set structure so that cover is flush with finished pavement elevation  $\pm$  0.25 inch.
    - b. Other Locations: Set utility vault so that cover is 4 inches above finished grade  $\pm$  1 inch.

### 3.03 PIPE CONNECTIONS

- A. Install connecting pipe at the required alignment and grade.
- B. Seal the pipe penetrations by installing a nitrile waterstop around the connecting pipe and filling the voids with non-shrink grout. The distance between the outside diameter of the penetrating pipe and catch basin core shall be a minimum of 2-inches but no more than 3-inches.

### 3.04 CLEANING

- A. Upon completion, clean each structure of all silt, debris, and foreign matter.

## END OF SECTION

## SECTION 02089

### PIPE POLYETHYLENE PROTECTIVE SLEEVES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Polyethylene protective sleeves for Ductile Iron Pipe in accordance with AWWA C105, except as modified and supplemented herein.

##### 1.02 REFERENCED SECTIONS

- 1. None

##### 1.03 SUBMITTALS

- A. Submittals shall contain the following information, as a minimum.
  - 1. Product data for polyethylene sleeves
- B. Furnish a certified affidavit of compliance for materials in accordance with AWWA C105.
- C. All costs incurred in making samples and test specimens for certification tests shall be borne by Contractor at no additional cost to Owner.

##### 1.04 STORAGE OF MATERIALS

- A. Store polyethylene materials in unopened packaging and not exposed to sunlight for more than 48 hours prior to installation.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS

- A. Polyethylene Sleeve Materials
  - 1. 8-mil thick, low density, polyethylene film sheets or formed into tubes.
  - 2. Conform to the minimum sheet and tube widths in AWWA C105.
  - 3. All polyethylene sheet materials shall be factory-marked at 2-foot intervals to include the manufacturer, product designation, thickness, and compliance with AWWA C105
- B. Tape: Not less than 2-inch wide pressure sensitive plastic tape not less than 20 mils thick, Polyken 900, Tapecoat CT, or equal.

#### PART 3 - EXECUTION

##### 3.01 INSTALLATION OF SLEEVES

- A. Install polyethylene sleeves using Method A in AWWA C105, providing a double thickness of sheet at each joint. Where joints are at irregular intervals, provide separate, additional lengths of tube at the joints.
- B. Install polyethylene sleeves on the pipe immediately prior to placement of pipe in the trench. Use fabric slings during pipe handling operations for protection of the polyethylene sleeves.

- C. After placement of each pipe section, take up the excess sleeve material along the barrel of the pipe and fold the excess along the length of the pipe. Secure the fold at several locations along the pipe barrel with tape.
- D. Tape ends and lapped joints of the polyethylene sleeve, and apply tape to tears and other visible defects. Replace sleeves with multiple pinholes, tears, or other defects before the pipe is backfilled. Bare metal contact directly with the surrounding soil is prohibited.
- E. Tape penetrations of the encasement made for wires associated with cathodic protection and anode systems.
- F. Carefully place and compact backfill and thrust blocks to prevent damage to the polyethylene sleeve. Repair tears and other damage due to backfill operations and thrust block installation by installation of a double thickness of polyethylene sheet with all edges lapped and taped.

### 3.02 INSTALLATION AT APPURTENANCES

- A. Provide double thicknesses of polyethylene sleeve at bends, reducers, tie rods, and other fittings and appurtenances. Tape lapped joints of the encasement.
- B. For valves, tees, crosses, and other complex appurtenances, wrap each with a double layer of split length of polyethylene sleeve or sheet by passing the sheets under and then over the appurtenance and bringing them together around the body of the appurtenance. Lap and tape all sheet edges, and at valve stems.
- C. At joints that contain bolts or other sharp edges, provide excess polyethylene sheet during the wrapping process to allow the sheet to conform to the surfaces without stretching or tearing. Prevent sharp edges from penetrating the encasement.
- D. To provide openings for connections required by blowoffs, air valves, and other appurtenances, make an x-shaped cut in the encasement for the penetration and then tape the opening securely to the appurtenance.
- E. For service taps, wrap the pipe with three layers of tape completely around the pipe to cover the area where the tapping machine and chain will be mounted. Install the corporation stop directly through the tape and polyethylene encasement. After completion of the tap, repair the entire circumferential area with tape as necessary to provide continuous encasement of the pipe.

**END OF SECTION**

**SECTION 02200**  
**SITE PREPARATION**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Site preparation work, as follows:
  - 1. Locating existing facilities.
  - 2. Installing safety and protective barriers.
  - 3. Constructing temporary access roads, work areas and storage areas.
  - 4. Clearing, grubbing, stripping, top soil removal and other initial work required for earthwork and trenching operations.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
  - 1. Section 01112 – Site Conditions
  - 2. Section 01330 – Submittals
  - 3. Section 02210 – Subsurface Investigations

1.03 DEFINITIONS

- A. Clearing: Consists of removal of natural obstructions and man-made objects and features including foundations, buildings, fences, lumber, stumps, debris, rubbish, brush, trees, boulders, and other items that interfere with construction operations or are specifically designated for removal.
- B. Stripping: Includes the removal and disposal of sod, grass, weeds, roots, and other organic material remaining after clearing has been completed.
- C. Top Soil: The native or cultivated surface-soil layer containing organic matter and typically consisting of a darker shade of brown, grey or red than the underlying subsoil. For the purposes of this project, the top 12 inches of soil in open areas is considered topsoil.

1.04 SUBMITTALS

- A. Comply with Section 01330.
- B. Submit:
  - 1. Materials used and layout of temporary fences
  - 2. Proposed staging and stockpile locations.

**PART 2 - PRODUCTS**

2.01 TEMPORARY FENCES

- A. Type: Heavyweight, high visibility, flat laminar mesh design.
- B. Material: High-density polyethylene.

- C. Height: 48 inches.
- D. Posts: Wood or metal posts at 10-foot spacing. Secure fence to posts with plastic cable ties.

### **PART 3 - EXECUTION**

#### **3.01 LOCATING EXISTING FACILITIES**

- A. Review the design drawings, maps, and other sources of information and identify existing facilities at the site to determine and mark the approximate locations of underground facilities.
- B. Follow rules adopted by the USA North 811 regarding locating and marking existing buried utilities and contact owners of existing underground utilities prior to beginning work in the vicinity of their utilities.
- C. Refer to Section 02210. Locate all existing utilities by exploratory excavations after field marking by the utility agencies and prior to any excavations in the affected areas.

#### **3.02 SAFETY AND PROTECTIVE BARRIERS**

- A. Along Public Roadways:
  - 1. Install appropriate barriers such as temporary fencing, plastic drums, or concrete traffic barriers to protect public from construction areas and to protect workers and existing facilities from danger of passing vehicles.
- B. Temporary Fences:
  - 1. Prior to beginning excavation, erect temporary fences along boundaries of temporary easements indicated on the Drawings.
  - 2. Maintain work activities within the confines of the temporary fences.
  - 3. Remove temporary fences when work in the vicinity is substantially complete.
- C. Existing Trees: Erect temporary fences around trees at the drip line that are adjacent to the Work and may be subject to damage unless protected. Maintain work activities outside of protected areas.
- D. Provide protective concrete slabs, steel plates or encasements for existing buried facilities that may be damaged by Contractor's equipment and vehicles.

#### **3.03 PRIMARY SITE ACCESS, WORK AND STORAGE AREAS**

- A. Develop primary access routes, work areas and storage areas as indicated on the Drawings.
- B. Clean up areas at the conclusion of the project and return the areas to their original or better condition.

#### **3.04 CLEARING**

- A. Clear construction areas of objectionable items and material, which, if left in place, would interfere with the proper performance of the work.
- B. Remove loose boulders within 10 feet from the tops of cut slopes. Incorporate boulders into landscaping or remove from the site.

- C. Dispose of material from clearing operations in an acceptable off-site location.

### 3.05 STRIPPING

- A. Remove the top layer of soil containing sod, grass, weeds and other vegetation to a depth of 6 inches from areas that will be affected by construction and site grading operations.
- B. Extend stripped areas at least 4 feet beyond the limits of cut and fill areas.
- C. Incorporate stripped material into landscaped areas as topsoil.

### 3.06 REMOVAL AND REPLACEMENT OF TOP SOIL

- A. Do not begin removal of topsoil until limits of work are marked, temporary construction fencing is in place and erosion control devices are properly installed.
- B. In open areas, remove topsoil within the following limits.
  - 1. Width of trench plus 10 feet on both sides of trench, except for paved areas and other areas without topsoil.
- C. Prior to removing topsoil, remove trash, debris or and other waste material that may be encountered. Grass, weeds and other vegetation do not need to be removed prior to stripping top soil.
- D. Set top soil material aside and maintain separation from the remainder of excavated trench material.
  - 1. Topsoil may be stockpiled near the work or moved to an off-site stockpile area. No stockpile areas have been designated on the Drawings.
  - 2. When topsoil is stockpiled along excavations, maintain edge of the stockpile a minimum of 6 feet away from the edge of the excavation.
  - 3. Limit height of stockpiles to 6 feet.
  - 4. Do not stockpile topsoil within tree protection zones.
- E. Replacement of Top Soil:
  - 1. After backfilling, grade and finish areas to receive topsoil, allowing for the specified depth of top soil replacement.
  - 2. Replace topsoil and smoothly spread material with a minimum of compaction.
  - 3. Finish areas covered with topsoil to blend into the finished topography with respect to the proper grade, contour and cross section. Rough grade replaced top soil to 2 to 4 inches higher than final elevations to allow for settlement.
  - 4. Bring the surface to a condition ready for planting operations.

### 3.07 TREE REMOVAL

- A. Remove specific trees indicated on the Drawings for removal. Cut tree so they fall into the area being cleared. Cut stumps no higher than 4 inches above the ground surface if the tree is within an area that will otherwise be undisturbed. Remove felled tree from the site.
- B. Timber Salvage: Property owners have the rights to any tree with caliper of 6 inches and larger that are felled. The Engineer will notify property owners at least 48 hours prior to

tree removal. If property owners elect to keep felled trees, they will be granted 7 calendar days after the tree is felled to remove the timber. If timber is not removed after 7 calendar days, the ownership of the timber shall revert back to Contractor.

### 3.08 TREE TRIMMING

- A. Permits are required to prune, cut, break, or damage roots of street trees. Contractor maybe subject to fines if tress are removed prior to obtaining a permit and may also be required to remove, replace, and mitigate for the loss of a damaged tree. The Contractor is required to coordinate with the Owner for tree trimming services required for this project.
- B. Timely Contractor communication with the Owner is required regarding activities that will require tree trimming:
  - 1. At least two weeks before beginning work that requires tree trimming, attend a walk-through of the project area with the Owner, Engineer, and the City Forester. Identify trimming necessary to complete the Work. Notify the Engineer of additional tree trimming work that may be needed during the project.
  - 2. Following Project completion, attend a final walk-through of the project area and identify any needed post-construction tree-related work.

### 3.09 REMOVAL OF EROSION CONTROL DEVICES

- A. Remove erosion control devices when bare soils are sufficiently revegetated to prevent on-site or off-site soil erosion.
- B. Straw wattles containing plastic netting, including plastic specified as phot-degradable, may not remain on site. Remove entire wattle or remove and dispose of plastic netting and spread straw from wattle across vegetated areas of site.

**END OF SECTION**

**SECTION 02210**  
**SUBSURFACE INVESTIGATIONS**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Requirements for subsurface investigations for locating existing utilities and points of connection to existing systems

1.02 REFERENCED SECTIONS

- A. None

1.03 SUBMITTALS

- A. Submit completed subsurface investigation report.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

3.01 GENERAL

- A. Contact USA North 811 and have existing utilities marked prior to performing field investigations.
- B. No additional compensation will be provided for locating utilities whether or not the utility is shown with reasonable accuracy on the Drawings.
- C. Survey of existing utility field locations shall be conducted by a firm or individual that possesses a valid state registration for land surveying. Provide survey information using the same basis used for the Project.

3.02 FIELD INVESTIGATIONS

- A. Perform field investigations prior to preparation of Shop Drawings for underground piping, and prior to excavation for installation of any underground facilities.
- B. Field locate existing underground utilities and other interferences shown on the Drawings or marked by USA and facilities where connections will be made as part of the Work. At a minimum, locate the following existing underground facilities:
  - 1. Crossing utilities up to 2 feet beneath the proposed utility or structure subgrade.
  - 2. Parallel utilities within 5 feet of the nearest trench wall of proposed utility or structure. Locate parallel utilities at a minimum every 100 feet. Decrease the spacing as necessary to accommodate fluctuations in the alignment of the existing utility.
  - 3. Proposed connections to existing underground utilities or facilities.
  - 4. Any other existing underground utility or facility that may affect the installation of the proposed underground facilities.

- C. Determine the following properties of each existing underground utility and interference.
  - 1. Horizontal location, including the design station or coordinates where the existing utility will cross or interfere with the proposed underground facility.
  - 2. Elevation of the top and bottom of the existing utility. For round utilities, bottom elevation can be estimated provided the outside diameter of the utility is determined. For box-shaped utilities or conduit banks, excavate to the bottom of the utility to determine the bottom elevation.
  - 3. The utility size, material type, and type of existing backfill
- D. Determine the following properties for each connection to existing underground utilities or structures:
  - 1. Horizontal location of the proposed connection point.
  - 2. Elevation of the top and bottom at the proposed connection point.
  - 3. Horizontal and vertical angle of existing utility in reference to the proposed underground utility.
  - 4. The utility size, material type, and type of existing backfill
- E. Prepare a detailed field investigation report to include the information described above. Organize the report by station.
- F. Following excavation and field data gathering, backfill excavations, and within paved areas, restore the surface pavement to match the material and thickness of the pre-investigation pavement unless otherwise required by the jurisdiction having authority over the pavement repairs.

**END OF SECTION**

**SECTION 02241**  
**CONTROL OF WATER**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Control of surface water and excavation drainage.
- B. Protection of the work against surface runoff, and exfiltration from existing pipes and structures.
- C. Collection, treatment, and disposal of removed water.

1.02 DEFINITIONS

- A. Excavation drainage includes keeping excavations free of surface water, seepage water, and exfiltration from existing pipes and structures.
- B. Surface drainage includes use of temporary drainage ditches and dikes and installation of temporary culverts and sump pumps with discharge lines as required to protect the work from any source of surface water.
- C. Construction Water: surface or groundwater that is subject to removal by the Contractor as necessary to complete the work.

1.03 PERMITS

- A. Obtain and comply with permits for the control and disposal of surface and groundwater.
- B. Pay all associated fees.
- C. Obtain coverage for Discharge or Reuse of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Volatile Organic Compounds (VOC), Fuel Leaks and Other Related Wastes, if appropriate, for any dewatering activity, including removal and discharge of groundwater, accumulated rainwater and removal of water from cofferdams or diversions.
- D. Comply with the conditions of the General Permit for Dewatering Activities and Caltrans BMP# NS-2 Dewatering Operations.

**PART 2 - PRODUCTS**

2.01 FACILITIES AND EQUIPMENT

- A. Provide necessary facilities and equipment for controlling surface water and excavation drainage as necessary to complete the Work.

**PART 3 - EXECUTION**

3.01 SURFACE AND EXCAVATION DRAINAGE WATER CONTROL

- A. Perform surface and excavation drainage water control in conformance with regulatory requirements as modified herein.

- B. Have available, on hand at all times during excavation activities,
  - 1. Sufficient pumping equipment and labor necessary to keep excavations clear of water as necessary to complete Work as specified.
  - 2. Adequate standby equipment as may be necessary to keep the control of water operation in full effect due to equipment or power failure.
- C. Commence control of water at an appropriate time during excavation and continue until facilities and structures are installed and backfilled and are sufficiently protected from the effects of hydrostatic uplift or floatation.
- D. Intercept surface and excavation water and divert it away from excavations through use of dikes, ditches, curb walls, pipes, sumps or other approved means. The requirement includes temporary works required to protect adjoining properties from surface drainage caused by construction operations.
- E. Excavations extending below groundwater levels or encountering perched groundwater.
  - 1. Where possible, direct inflow to a sump where water can be removed by a pump within narrow trench excavations that penetrate less than a few feet below the groundwater level and do not encounter loose or cohesionless soils.
  - 2. Provide well points, perimeter trench drains, or deep sumps as necessary to control of water within wider, deeper, and/or more extensive excavations.
  - 3. To maintain bottom stability of wider, deeper, or more extensive excavations, draw down groundwater levels a minimum of 5 feet below the lowest portion of the excavation.
- F. Control water in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation and protect temporary excavation slope stability during construction.
  - 1. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, obtain authorization from the Engineer to excavate and replace the affected areas with drain rock on geotextile fabric with additional compensation at the unit price shown in the Contractor's Base Bid.
- G. Implement ground settlement monitoring, prior to the commencement of the dewatering operation:
  - 1. Survey existing structures in the vicinity of the proposed dewatering operation,
  - 2. Monitor the existing structures for settlement, both total and differential, throughout the dewatering operation.
  - 3. Prepare a daily report for each structure and provided to the Engineer identifying the original baseline elevation; the elevation measured each day, and corresponding total and differential settlement.
  - 4. Modifications to the dewatering program may be necessary, as determined by the Engineer, should dewatering induced settlements be detected.

### 3.02 DISPOSAL OF WATER

- A. Recycled water shall be disposed into the City sewer system at a flow rate below 250 gpm. Contractor shall complete a no fee permit application to discharge water into the sewer collection system. The discharge water shall have limits on TSS and pollutants.
- B. Design and control the dewatering operations such that disposal of water does not cause erosion or other damage and such that water to be disposed of is free from silt and other objectionable materials.
- C. Use settling basins and/or other means to control groundwater quality prior to discharge as necessary.
- D. Follow the applicable construction activity Best Management Practices (BMP) for the project.
- E. Refer to "Caltrans Storm Quality Handbooks, Construction Site Best Management Procedures Manual", May 2017 or latest edition.

### 3.03 TERMINATION OF DEWATERING

- A. Terminate control of dewatering operations in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures, pipelines, and sewers.
- B. If damage occurs due to improper termination of dewatering, repair the damage to the satisfaction of the Engineer and at no additional cost to the Owner.
- C. Remove control of water devices following completion of the Work requiring control of water.

**END OF SECTION**

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**SECTION 02260**  
**EXCAVATION SUPPORT AND PROTECTION**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Section includes:
  - 1. Requirements for excavating, sheeting, and shoring required to construct jacking and receiving pits for horizontal auger boring.
- B. Assume sole responsibility for designing and sizing the pit excavations to accommodate the construction method, all permanent structures, and conform to Caltrans' Encroachment Permit requirements.
- C. Relocate, support, or bypass all utilities required in the performance of the Work.
- D. Furnish all designs, tools, equipment, materials, and supplies and perform all labor required to complete the Work as indicated on the Drawings and specified herein.

1.02 REFERENCED DOCUMENTS

- A. Referenced Sections:
  - 1. Section 01330 – Submittals
  - 2. Section 01570 – Storm Water Quality Control
  - 3. Section 02200 – Site Preparation
  - 4. Section 02241 – Control of Water
  - 5. Section 02306 – Geotechnical Instrumentation and Monitoring
  - 6. Section 02446 – Horizontal Auger Boring
  - 7. Section 02320 – Trenching

1.03 REFERENCED STANDARDS

- A. General:
  - 1. The following documents form part of the Specifications to the extent stated. Bring conflicts between Specifications, Drawings, and the referenced documents to the attention of the City, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the most stringent shall apply.
  - 2. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual or test designation in effect the date the Notice to Proceed with the Work is given.
- B. ASTM International:
  - 1. ASTM A36 – Standard Specification for Carbon Structural Steel
  - 2. ASTM A328 – Standard Specification for Steel Sheet Piling

3. ASTM A500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
  4. ASTM A572 – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
  5. ASTM A992 – Standard Specification for Structural Steel Shapes
  6. ASTM C33 – Standard Specification for Concrete Aggregates
  7. ASTM C150 – Standard Specification for Portland Cement
  8. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- C. American Welding Society
1. AWS D1.1/D1.1M – Structural Welding Code - Steel
- D. NSF/ANSI Standard 60, Drinking Water Treatment Chemicals – Health Effects
- E. Caltrans Department of Transportation Trenching and Shoring Manual.
- F. Caltrans Encroachment Permit
- G. Caltrans Standard Plans – 2023 Edition
- H. Caltrans Standard Specifications – 2023 Edition
- I. California Labor Code

#### 1.04 DEFINITIONS

- A. Alternate pit locations: A pit location proposed by the Contractor not shown on the drawings. Alternate pit locations include: A differently located or sized pit, a rescue pit, or an additional pit.
- B. Cave-in. The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.
- C. Bracing: Horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against wales.
- D. Jacking pit: See Section 02446, Horizontal Auger Boring.
- E. Lagging: A horizontal element restraining the lateral movement of a cut soil face and supported by soldier piles or wales. Lagging is typically timber, precast concrete, or shotcrete.
- F. Receiving pit: See Section 02446, Horizontal Auger Boring.
- G. Penetration resistance of soil based on SPT blow counts: See Section 02446, Horizontal Auger Boring.
- H. Sheet piling: The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

- I. Shield: A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure.
- J. Shoring: A structure such as metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.
- K. Slide rail shoring system: a modular shoring system consisting of drilled-in-place vertical rails and multiple steel panels which are slid into place along the tracked rails as earth is excavated.
- L. Support system: A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.
- M. Wales: Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

#### 1.05 SYSTEM DESCRIPTION

- A. Design Requirements:
  - 1. Pits shall conform to Caltrans Encroachment Permit requirements.
  - 2. Pits shall have crushed-rock and sump areas to clear groundwater and construction water. Where groundwater is found and pumping is required, the pits shall be lined with filter fabric.
  - 3. Coordinate the pit design and construction with the requirements of Section 02446, Horizontal Auger Boring, the selected means and methods for performing the Work, and permanent structures and utilities shown on the Drawings.
  - 4. Design and construct excavation support systems and pit invert meeting the following requirements:
    - a. Compatible with the subsurface ground conditions as provided in this Section.
    - b. In accordance with loads and analyses described in Caltrans Trenching and Shoring Manual, while taking into consideration the Contractor's construction means and methods, equipment surcharge loads, material stockpiling, and maximum allowable jacking forces.
    - c. To withstand traffic loading.
    - d. To achieve a minimum factor of safety of 2.0 against sliding and 1.5 against bottom heave.
  - 5. Selection of an appropriate pit shoring and construction method(s) is the responsibility of the Contractor. Acceptable shoring methods include:
    - a. Steel sheet piling
    - b. Soldier piles and timber or steel lagging
    - c. Steel liner plates and ribs
    - d. Corrugated metal pipe
    - e. Slide rail shoring system
  - 6. Shield systems will not be permitted for pit construction.

7. Pit size and location
  - a. Pit locations are as shown on the Drawings and shall conform to work area limitations as shown on the Drawings.
  - b. Alternate pit locations shall comply with the following conditions:
    - 1) Shall not be located in cross streets, or block a sole entrance or exit to a property.
    - 2) Shall be acceptable to the Engineer and be submitted by the Contractor to Caltrans for a new Caltrans Encroachment Permit.
    - 3) Obtain and provide all approvals and permits for alternate pit locations to the Engineer.
  - c. Pit construction shall not disturb pavement structural section within Caltrans right of way.

B. Performance Requirements:

1. Construct pits using shoring support systems which apply positive ground support along the pit walls to limit lateral movement to less than 0.5 inches and prevent the loss of ground and settlements in excess of those specified in Section 02306, Geotechnical Instrumentation and Monitoring. The shoring systems shall be used along all portions of the pit perimeter walls.
2. Limit groundwater infiltration into each pit to less than 10 gpm into the excavation from all sources.

1.06 SUBMITTALS

A. General:

1. Submit in accordance with Section 01330, Submittals, and as specified herein.
2. Submittals shall be coordinated with all relevant submittals, assembled and submitted as a single, comprehensive submittal.
3. Where calculations are required to be submitted, they shall be signed and sealed by the Contractor's Engineer. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information.
4. Provide written notifications as specified herein or within one workday.
5. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

B. Product Data:

1. Material Safety Data Sheets.
2. Product data for all shoring and bracing.
3. Manufacturer's mixing and handling requirements, personal safety equipment, first aid measures, and methods for proper storage and disposal of waste materials, including containers.

4. Proposed concrete mix and product data, including cement, additives, and aggregates.
- C. Shop Drawings:
1. Shop signed and stamped by the Contractor's Engineer, shall include:
    - a. Drawings for all shoring and bracing.
    - b. Methods, procedures, and sequence for preloading and installing bracing.
    - c. Foundation details for all permanent structures.
    - d. Sequence for removing shoring in conjunction with backfill placement.
    - e. Invert preparation and foundation details for temporary working conditions.
- D. Work Drawings:
1. Existing Site Drawing: for each pit location indicating utilities, structures, and vegetation that are to be protected in place.
  2. Construction Site Drawing: for each pit indicating the location, excavation dimensions, site grading, and site development details for the excavation and work areas, and the proposed limits of disturbance. Include details of types, amounts, and positioning of materials and equipment required at each location. Show relocated utilities, overhead utilities, and other overhead conflicts.
  3. Drawings for diversion of drainage features impacted by pit construction.
- E. Method Statements:
1. Detailed work plan and calculations for all shoring, bracing, sloping of sides of excavation, or other provisions for worker protection against the hazard of caving ground during pit excavation, tunneling and other work, prepared by the Contractor's Engineer. Contractor's attention is directed to the provisions for Shoring and Bracing Drawings in the California Labor Code.
  2. Sample daily Installation Log.
  3. Work plan shall include loads, materials and equipment to be used, the method and sequence and timing of installation, and site restoration plan.
  4. Pit ventilation system details including fan size and operating parameters.
  5. Electrical system, lighting system, and onsite power generation details.
  6. Provide design calculations used to size shoring members, determinable material specifications and joint and connection details. Include stability evaluations at each stage of excavation, backfill and shoring removal, and invert stability. Indicate calculated deflections for allowable load limits.
  7. Foundation preparation method to accommodate anticipated thrust loads as determined by the Contractor per Section 02446, Horizontal Auger Boring.
  8. Work plan for pit restoration within Caltrans right-of-way. At minimum, identify proposed materials, equipment, and procedures for invert preparation, backfilling, compaction, shoring removal, and restoration.

F. Quality Control Submittals:

1. Plan:
  - a. Contingency Plan: Describe the steps and actions needed to stabilize the excavation and excavation support systems if the excavation becomes unstable or the monitoring data indicate movements exceed the allowable limits. Include a list of contingency materials and equipment to be kept available on site for installation.
  - b. Field Inspection Plan: For field verification of the pit design that at a minimum, measures and records settlement, bottom heave, groundwater elevation, and pit member deflections daily.
2. Workforce Qualifications:
  - a. Firm performing the Work.
  - b. Contractor's Engineer.
  - c. Contractor's Surveyor.
3. Certificates:
  - a. Products described herein including Certificates of Compliance from the manufacturer.
  - b. Personnel trained in handling, mixing, injection, and disposal of materials.
4. Record Keeping:
  - a. Provide pit daily Installation Logs on the same date as taken and interpretation by noon the following work day.
  - b. Provide daily Installation Logs, to include the following as applicable:
    - 1) Shoring element description, location, length, plumbness, and bearing material.
    - 2) Concrete, grout, and steel properties.
    - 3) Dates for excavation completed and concrete placed.
    - 4) Dimensions of top and bottom of pits.
    - 5) Elevations of top of ground, top of shoring elements, and bottom of shoring elements.
    - 6) Results of all tests and observations.
5. Notifications:
  - a. Provide written notification within 1 work day when pit performance requirements are not met.
  - b. Provide written notification within 1 work day when implementing of any contingency measure.
6. As-Builts: (NOT USED)

## 1.07 QUALITY ASSURANCE

### A. Qualifications:

1. Contractor's Engineer: Excavation support systems shall be designed by a Civil or Structural engineer registered in the State of California who has a minimum of five (5) years of experience in pit excavation support designs including pits of similar size and in similar ground conditions as measured by ground type, N values, and depth of groundwater.
2. Contractor's Surveyor: Surveying shall be performed by a California licensed surveyor who has surveyed a minimum of five (5) pits in the last five (5) years.
3. Firm's experience in constructing jacking and receiving pits. The installations must have been performed in the last five (5) years in similar ground conditions as measured by soil type, N value and hydrostatic head, as anticipated on this project.

### B. Welding: in accordance with AWS D1.1/D1.1M.

### C. Preconstruction Meeting: (NOT USED)

## 1.08 DELIVERY, STORAGE AND HANDLING (NOT USED)

## 1.09 JOB CONDITIONS

### A. The anticipated subsurface conditions are as follows:

1. Soil types at the pit locations will consist of:
  - a. Artificial fill.
  - b. Holocene-age stream terrace deposits: medium stiff sandy silt and lean clay, and loose clayey sand, each with few amounts of fine to coarse grained gravel (5 to 10% by weight).
2. Below the groundwater table, soils will exhibit poor stand-up time and enter unsupported sections of excavation.
3. The groundwater table will be above the anticipated shaft invert as shown on the Drawings. The groundwater will have seasonal fluctuations of +/- 5 feet in respect to the maximum measured groundwater table shown on the Drawings.
4. Tree roots will be encountered at both pits.
5. For additional geotechnical information refer to the Geotechnical Data Report (GDR).

### B. Refer to Section 4, Changes in Work, for handling of subsurface or latent physical conditions which are materially different from the anticipated subsurface conditions described in the Contract Documents.

### C. Perform all work in accordance with the Cal/OSHA tunnel classification.

## 1.10 SEQUENCING AND SCHEDULING

### A. Prior to beginning any pit excavation five (5) feet deep or more, Contractor shall:

1. Provide all submittals required in this Section to Engineer and shall be in receipt of written acceptance by the Engineer.

2. Completed baseline readings as required by Section 02306, Geotechnical Instrumentation and Monitoring.
- B. Site restoration shall follow construction as the Work progresses and be completed no later than 30 days after the carrier pipe is installed. Any testing or further inspection necessary for final completion and inspection of the pipe shall not be cause for any delay of restoration Work required under this Contract. This provision for restoration shall include all property that was affected by the construction operations. Such final restoration that cannot be performed within the 30-day period due to adverse weather conditions may upon written request, including a proposed procedure and time schedule, be performed as accepted by the Engineer. Any delayed restoration will be contingent upon providing suitable safe temporary facilities without inconvenience or nuisance in the interim.

#### 1.11 WARRANTY (NOT USED)

### **PART 2 - PRODUCTS**

#### 2.01 MATERIALS

- A. Provide all shoring materials in accordance with accepted submittals.
- B. Structural Steel:
1. HP shapes: ASTM A572, Gr. 50.
  2. Channels, angles and plates: ASTM A36
  3. Wide flange: ASTM A992.
  4. Hollow steel section: ASTM A500.
  5. Sheet piles: ASTM A328.
- C. Corrugated Metal Pipe (CMP): Zinc Coated.
- D. Concrete materials:
1. Portland Cement: ASTM C150, Type I or II.
  2. Fly Ash/Slag
    - a. Fly Ash Admixture: ASTM C618, Class C or F
    - b. Ground Granulated Blast Furnace Slag: ASTM C33, uniformly graded,  $\frac{3}{4}$  in maximum aggregate size.
  3. Normal Weight Aggregate: ASTM C33, uniformly graded,  $\frac{3}{4}$  in maximum aggregate size.
  4. Water: Potable or recycled water.
  5. Bentonite: High yield sodium bentonite; NSF/ANSI Standard 60 compliant.
  6. Admixtures: Shall be accepted by Engineer. If commercially available and acceptable to the product manufacturer all polymers, and additives, other than soda ash, shall be NSF/ANSI Standard 60 compliant.
- E. Timber: Unless otherwise noted, timber used for lagging or any other structural use shall be Douglas Fir No. 1 grade or better and of rectangular cross section.

F. Welding materials: in accordance with AWS D1.1/D1.1M.

## 2.02 EQUIPMENT (NOT USED)

### PART 3 - EXECUTION

#### 3.01 GENERAL

- A. Perform all work in accordance with accepted submittals.
- B. Provide Engineer and City with access to the pit.
- C. Maintain a copy of the Contract Documents at a location acceptable to Engineer and accessible to the pit construction Contractor and Engineer.
- D. Treat and dispose of all water in accordance with the requirements specified in Section 02241, Control of Water.

#### 3.02 INSTALLATION

- A. Prior to beginning demolition or excavation, perform a survey in accordance with City Standard Specifications that identifies and locates facilities within 50 feet of the pit excavation.
- B. Contractor's Surveyor shall stake locations of the pit elements and guide frames as required and in accordance with City Standard Specifications.
- C. Highway Embankment Erosion Control:
  - 1. Provide in accordance with Section 01570, Storm Water Quality Control and Caltrans Standard Plan H51 "Erosion Control Details Fiber Roll and Compost Sock".
- D. Excavation
  - 1. Locate all utilities in accordance with Section 02200, Site Preparation, before commencing excavation.
  - 2. All earthwork shall be performed in same manner as required for a trench excavation in accordance with Section 02320, Trenching.
  - 3. Upon completion of pit excavation and removal of the water contained within the pit, install sump pump(s) to remove all incidental, construction, and storm water.
- E. Pit Construction: General
  - 1. Protect existing structures, utilities, vegetation, and facilities before commencing pit excavation.
  - 2. Install instrumentation as specified in Section 02306, Geotechnical Instrumentation and Monitoring, before pit excavation.
  - 3. If settlement or deflections of supports or pit bottom indicate the support system requires modification, Contractor's Engineer shall redesign and resubmit revised shop drawings and design calculations.
  - 4. Construct jacking pits with shoring flush with the existing ground surface or extending not more than 4 feet above the existing ground surface.

5. Pits located within 15 feet of traffic lanes shall not extend more than 36 inches above the pavement grade. Reflectors shall be affixed to the sides facing traffic, and placement around the perimeter of a 6-foot chain link fence during non-working hours.

F. Pit Construction: Internal Bracing Support System

1. Construct the internal bracing support system using walers, struts, and/or shores as required by the design accepted in Contractor's submittals.
2. Construct and maintain all bracing support members in intimate contact with other support members and with the ground.
3. Preload bracing members by jacking struts to 50 percent of the design load if necessary to control shoring movement.
4. Preload bracing members in accordance with methods, procedures, and sequence as described on the shop drawings.
5. Use procedures that produce uniform loading of bracing members without eccentricities or over-stressing and distortion of members or system.

G. Backfilling and compaction:

1. When within City of Healdsburg or Sonoma County right-of-way: fill and compact with backfill in same manner as required for a trench excavation in accordance with Section 02320, Trenching.
2. When within Caltrans right-of-way: fill and compact trench zone and pipe zone with backfill in same manner as required for a trench excavation in accordance with Section 02320, Trenching. All other earthwork shall be in accordance with Caltrans Standard Specifications.

3.03 FILED QUALITY CONTROL

- A. Provide quality control, testing, and inspection as required in the accepted submittals.

3.04 INSPECTION, MAINTENANCE, AND REPAIR (NOT USED)

3.05 INSTRUMENTATION AND MONITORING (NOT USED)

3.06 SITE RESTORATION

- A. Restore all pit locations and work areas in their entirety to their original pre-construction condition.
- B. After all equipment and excavated materials for the horizontal auger boring have been removed from the jacking pit, Contractor shall prepare the bottom of the pit in the same manner as a pipe foundation, Contractor shall remove all loose and disturbed materials below pipe grade to undisturbed ground and re-compact the material in same manner as required for a trench excavation in accordance with Section 02320, Trenching.
- C. Remove excavation support to a minimum of 4 feet below grade during pit backfill operations. Perform removal in a manner that avoids ground settlement and damage to adjacent facilities, embankments, and vegetation.
- D. All surface improvements damaged or removed shall be reconstructed to the same dimensions, except for pavement thickness, and with the same type materials used in the

original Work. Pavement resurfacing shall be one (1.0) inch greater in thickness than the existing unless otherwise shown on the Drawings.

- E. Restore all fencing removed within work areas. Fencing shall be in accordance with Caltrans Standard Plan A85 "Chain Link Fence Details".
- F. Restore all state facilities, including embankment and surface drainage features within Highway 101 right-of-way, in accordance with the Caltrans Encroachment Permit and Caltrans Standards, whichever is more restrictive.

**END OF SECTION**

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## SECTION 02260

### PIPELINE EXCAVATION SUPPORT AND PROTECTION

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Temporary pipeline excavation support systems.

##### 1.02 REFERENCED SECTIONS

- A. The following Section is referenced in this Section:
  - 1. Section 02320 – Trenching

##### 1.03 DEFINITIONS

- A. Protection Systems:
  - 1. Sloping or benching systems for excavated slopes.
  - 2. Structural support systems, shield systems, and other systems for preventing excavation wall failure.

##### 1.04 SUBMITTALS

- A. Submit information as a complete package. Include all items required by the Contract Documents. Incomplete submittals will not be reviewed and will be returned for resubmittal as a complete package.
- B. Shop Drawings
  - 1. Prepared, signed and sealed by a professional engineer who is registered to practice in the state of California.
  - 2. Clearly indicate structural sections of shoring members, welding details, bolting details and bracing details.
  - 3. Indicate existing and new structures, pipelines and other improvements located in the vicinity and impacting the design of the shoring system.
  - 4. Provide details for bracing, reinforcement and sealing around penetrations.
- C. Calculations: Structural calculations verifying and demonstrating the structural safety and adequacy of the sheeting, shoring and bracing to be used.
  - 1. Prepared, signed and sealed by a registered Professional Civil or Structural Engineer who is registered to practice in the State of California.
  - 2. Provide calculations for the different load, support and other conditions that occur during the sequence of installation, construction of facilities protected by the shoring and the sequence of removal of the internal bracing and shoring.
- D. Sheet Pile Driving Equipment: Information on type of equipment to be used, including manufacturer, model number and driving energy.
- E. Qualifications of registered Professional Engineer and shoring installer, including project references.

- F. Prepare a detailed plan illustrating the sequence of installation and removal of shoring systems and internal bracing. Include sketches showing the various stages in the sequence.
- G. Letter confirming installation of the shoring system is in accordance with the shoring design.

#### 1.05 INSTALLER QUALIFICATIONS

- A. Shoring installer must have a minimum of five successful past installations of shoring systems of comparable overall heights and comparable penetration of soils similar to those found on the project site.

#### 1.06 PERFORMANCE REQUIREMENTS

- A. Design and install excavation support and protection systems that are capable of:
  - 1. Supporting excavation sidewalls and bottom to maintain the required excavation or trench section.
  - 2. Resisting soil and hydrostatic pressure and superimposed construction loads and other live loads.
  - 3. Protecting existing facilities in the vicinity of the excavation from damage due to settlement or movement of soil
- B. Provide professional engineering services necessary to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified professional engineer registered in the State of California.
- C. Install and remove excavation support and protection systems without damaging existing buildings, pavements, utilities, railroad facilities and other improvements adjacent to excavation.
- D. Excavations
  - 1. Protect workers from hazard of caving ground and other hazards.
  - 2. Install excavation protection system in locations where:
    - a. Protection system is specifically indicated on the Drawings.
    - b. Excavations are equal to, or greater than, 5 feet deep.
    - c. Excavations are less than 5 feet deep, but there is a potential for cave-in.
    - d. When engineering analyses prepared by the Contractor indicate the stability of existing structures and facilities may be jeopardized by settlement or movement of soil.

#### 1.07 GENERAL DESIGN REQUIREMENTS

- A. Design excavation support systems to meet requirements and standards of the Occupational Safety and Health Administration (OSHA).
- B. Design excavation support systems to meet the requirements of California Code of Regulations, Title 8 – Construction Safety Orders and California Labor Code Sections 6705 to 6707.

- C. Design structural steel members in accordance with the American Institute of Steel Construction (AISC) Manual of Steel Construction Allowable Stress Design and the Uniform Building Code.
- D. Excavation support systems for trench excavations shall be selected by the Contractor based on the soil conditions, depths of trench excavations, groundwater conditions and other site conditions. No attempt has been made by Engineer to define acceptable trench shoring options.
- E. Allowable Deflection: Not more than 1/2-inch at any point on the shoring system.
- F. Cantilevered Design Limits:
  - 1. Maximum height of cantilevered shoring above the bottom of the excavation shall not exceed 15 feet.
- G. Resistance to Overturning
  - 1. Design soldier piles and sheet piles with sufficient depth below the excavation to:
    - a. Resist lateral movement or overturning of the pile, and
    - b. Act as an effective water cutoff to prevent heaving or flow of soil into the excavation.
  - 2. Calculate the required depth of pile below the bottom of the excavation by assuming the soil immediately below the bottom of excavation does not provide passive resistance for a depth of 1.5 times the effective pile diameter.

#### 1.08 DESIGN REQUIREMENTS FOR SOLDIER PILES AND LAGGING

- A. Design soldier piles for downward loads including vertical loads from tie back anchors.
- B. Flexural Strength of Lagging: In accordance with the Uniform Building Code, but not greater than 1,500 psi.
- C. Wales: Use back-to-back structural members.
- D. Soil Anchors, Rock Anchors and Deadmen Anchors:
  - 1. Design tie back anchors with a safety factor of not less than 2 times the calculated load from the shoring.
  - 2. When calculating the length of soil anchors needed to resist the load from the shoring, do not include any anchor length within the potential active pressure soil failure zone behind the face of the shoring.
  - 3. Design anchor tie rods for 130 percent of the calculated load from the shoring.
  - 4. When tie rod couplings are used, design anchor tie rods for 150 percent of the calculated load from the shoring.

#### 1.09 GEOTECHNICAL REPORT

- A. A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Engineer will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for design of the excavation support systems.
2. Copies of the geotechnical report are bound in this Project Manual but are not a part of the Contract Documents.

#### 1.10 JOB SITE POSTINGS

- A. Maintain at least one copy of the protection system design at the job site while the excavation is open in accordance with the requirements of California Code of Regulations, Title 8 Construction Safety Orders and the California Labor Code.

#### 1.11 SEQUENCE AND SCHEDULING

- A. Do not begin excavations or installation of excavation supports until submittals for excavation support systems have been accepted by the Engineer and until materials necessary for installation are on site.
- B. Allow a minimum of 14 calendar days for Engineer's review of submittals for excavation support systems.
- C. Do not begin excavations or installation of excavation supports until initial survey measurements on control points on existing structures and other improvements are obtained to document initial elevations and locations.

### **PART 2 - PRODUCTS**

#### 2.01 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel Soldier Beams: ASTM A36, ASTM A690 or ASTM A992.
- C. Steel Sheet Piling: ASTM A328, ASTM A572 or ASTM A690; with continuous interlocks.
- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness as determined by design calculations, but not less than 3 inches.
- E. Lean Concrete Mix:
  1. A mixture of sand, fine aggregate, water and 2 sacks of cement per cubic yard to create a flowable mixture that fills voids.
  2. Minimum Compressive Strength: 1500 psi.

### **PART 3 - EXECUTION**

#### 3.01 PREPARATION

- A. Prior to beginning installation of the excavation support system, pothole to locate existing buried utilities in the vicinity of the excavation. Survey utilities and compare actual locations to those locations indicated on the Drawings and the Shop Drawings. Determine any areas of conflict and revise the design and layout of the excavation support system to eliminate these conflicts.

### 3.02 SLOPING AND BENCHING OF EXCAVATED FACES

- A. Where structural excavation support systems are not specifically indicated on the Drawings, sloping and benching systems for exposed faces of excavations may be utilized.
- B. Construct sloping and benching systems in accordance with Section 02320.

### 3.03 TRENCHING SUPPORT SYSTEMS

- A. Where structural excavation support systems are not specifically indicated on the Drawings, trench support systems consisting of hydraulic jacks and plates, trench shield systems, and other trench protection systems may be utilized.

### 3.04 SOLDIER BEAMS AND LAGGING

- A. Before starting excavation, drive steel soldier beams or install steel soldier beams in pre-drilled holes.
  - 1. Installation of Soldier Beams in Pre-Drilled Holes
    - a. Diameter of pre-drilled hole: Not to exceed the outside dimensions of the soldier beam.
    - b. Backfill around soldier beam using a lean concrete mix.
- B. Space soldier beams at regular intervals not to exceed allowable flexural strength of the wood lagging. Align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.
- C. Install wood lagging within flanges of soldier beams as excavation proceeds. Trim excavation as required to install lagging.
- D. Install horizontal wales at locations indicated on the shop drawings and secure to soldier beams.
- E. Fill voids behind lagging with gravel, lean concrete or other material acceptable to the Engineer.

### 3.05 SHEET PILING

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

### 3.06 BRACING

- A. Locate bracing to clear temporary and permanent work and to allow lowering of material and equipment into the excavation.
- B. If necessary to move brace, install new bracing before removing original brace.
- C. Install internal bracing when calculations indicate bracing is required to prevent spreading or distortion of braced frames.
- D. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.07 INSPECTION

- A. Designer of the shoring system is responsible for confirming proper installation of the shoring system. Shoring system designer, or a representative of the designer, shall make site visits to confirm installation is in accordance with the accepted shoring design.
- B. Submit letter of proper installation confirming installation is in accordance with the shoring design.

**END OF SECTION**

## SECTION 02306

### GEOTECHNICAL INSTRUMENTATION AND MONITORING

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. Section includes:
  - 1. Requirements for furnishing, installing, monitoring, reading, recording, maintaining, protecting, and removing or abandoning geotechnical instrumentation pertaining to the work described in Section 02260, Excavation Support and Protection, and Section 02446, Horizontal Auger Boring.
  - 2. Requirements for pre-construction and post-construction documentation of existing conditions.
- B. Geotechnical instrumentation consists of pavement monitoring points, utility monitoring points, and optical survey targets.
- C. Establish all control points for geotechnical instrumentation and monitoring outside the Zone of Influence of all excavations to be made during the execution of the Work.
- D. Furnish all designs, tools, equipment, materials, and supplies and perform all labor required to complete the Work as indicated on the Drawings and specified herein.

##### 1.02 REFERENCED SECTIONS:

- A. Section 01330 – Submittals
- B. Section 02200 – Site Preparation
- C. Section 02260 – Excavation Support and Protection
- D. Section 02446 – Horizontal Auger Boring

##### 1.03 REFERENCED STANDARDS

- A. General:
  - 1. The following documents form part of the Specifications to the extent stated. Bring conflicts between Specifications, Drawings, and the referenced documents to the attention of the City, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the most stringent shall apply.
  - 2. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual or test designation in effect the date the Notice to Proceed with the Work is given.
- B. ASTM International:
  - 1. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
  - 2. ASTM C150 – Standard Specification for Portland Cement
  - 3. ASTM C778 – Standard Specification for Standard Sand

## 1.04 DEFINITIONS

- A. Contractor Action Value: A set of three predetermined values related to Maximum Allowable Movement, which when attained, Contractor implements notification and mitigation measures as described in this Section.
- B. Geotechnical Instrumentation: Devices measuring groundwater levels, surface and subsurface movement, and movement of existing infrastructure. Includes measurement devices and appurtenant equipment, probes, sensors, cabling, readout devices, and data loggers and PC-based data management systems; including ancillary facilities required for their operation, such as boreholes, casings, housings, and covers.
- C. Monument (Protective enclosure): A locking steel enclosure case installed to provide protection for instrumentation from vandalism, traffic, and/or debris.
- D. Response Value: A predetermined Contractor Action Value, which when attained, Contractor responds as described in this Section.
- E. Pavement Monitoring Point: PK masonry nails with metal identification tag, as shown on the Drawings.
- F. Pre-construction: A point in time prior to initiation of any excavations greater than 4 feet deep, other than potholing.
- G. Post-construction: A point in time when all excavations required for the Work have been restored in accordance with the Contract Documents.
- H. Shutdown Value: A predetermined Contractor Action Value, which when attained, Contractor responds as described in this Section.
- I. Survey Control Point: Temporary location established outside the Zone of Influence of any construction activities and used as a fixed reference or control point to monitor by survey methods the occurrence and amount of vertical and horizontal displacements at instrument locations.
- J. Threshold Value: A predetermined Contractor Action Value, which when attained, Contractor responds as described in this Section.
- K. Utility Monitoring Point: A system for monitoring vertical deformation (settlement or heave) of an existing subsurface utility.
- L. Optical Survey Target: An instrument used to monitor vertical and horizontal displacements by survey methods.
- M. Zone of Influence: Any area which may be subject to measurable or observable ground movement resulting from construction activities. The area is dependent on the means and methods in executing the Work.

## 1.05 SYSTEM DESCRIPTION

- A. Design Requirements: The instrumentation plan shall be in accordance with the Drawings, as a minimum requirement.
- B. Performance Requirements:
  - 1. Maximum allowable movement ( $M_A$ ) by instrument:
    - a. Pavement Monitoring Point (PMP):  $\pm 0.50$  inches vertical (V).

- b. Optical Survey Target (OST):  $\pm 0.50$  inches vertical (V) and horizontal (H).
  - c. Utility Monitoring Point (UMP):  $\pm 0.50$  inches vertical (V).
2. Contractor Action Values:
- a. Threshold Value = 50%  $M_A$ : Provide written notice within 24 hours of occurrence and meet with the Engineer within 24 hours of providing notice to discuss means and method to determine what changes, if any, shall be made to better control ground movement. Instrument readings shall be made daily until five consecutive work days of readings remain unchanged; at which point the readings will revert to the reading frequency specified herein.
  - b. Response Value = 80%  $M_A$ : Provide verbal notice within one hour upon occurrence. Provide a written notice and meet with the Engineer within 24 hours to discuss means and methods to determine what changes shall be made to better control ground movement. Actively control ground movement in accordance with the accepted plan to prevent reaching the Shutdown Value. Instrument readings shall be made daily until five consecutive work days of readings remain unchanged; at which point the readings will revert to the reading frequency specified herein.
  - c. Shutdown Value = 100%  $M_A$ : Stop all work immediately and provide immediate written notice. Meet with the Engineer to develop a plan of action before any Work resumes.
3. All measured deflection values are relative to the baseline value identified at the start of construction. Baselines shall not be reset following different work activities and shall remain the same for the duration of this Contract.
4. The required Contractor Actions specified herein shall apply to any visualization of ground movement between monitoring points including sinkholes, ratholes, and other visual forms of ground movement.
5. Monitoring Frequency: Contractor shall meet the following schedule of minimum requirements for monitoring frequencies and durations:
- a. During excavations: Whenever an excavation is greater than 4 feet deep within a 150-foot distance of an instrument:
    - 1) Pavement Monitoring Point (PMP): Every two (2) hours during work hours of each workday
    - 2) Utility Monitoring Points (UMP) and Optical Survey Targets (OST): Once per workday.
  - b. Excavation monitoring frequencies shall not be reduced until instrumentation data indicates ground has stabilized.
  - c. Post-Construction: Every two (2) months, three (3) measurements in total, and as required by Caltrans.
6. Tolerances:
- a. General: Install within 12 inches of theoretical location specified or indicated, while avoiding obstacles or utilities, except where otherwise approved by the Engineer.

- b. Elevation monitoring survey shall be made by closed differential level loops and must be tied to project control. Elevation monitoring closed level loops shall close within  $\pm 5\text{mm}$ . Horizontal accuracy to meet  $\pm 5\text{mm}$  accuracy (95% confidence level) relative to the project control.
- c. Survey Reference Point Readings:
  - 1) Survey monitoring points shall be measured to within  $\pm 2\text{mm}$  (95%) relative to the vertical control and  $\pm 5\text{mm}$  (95%) relative to horizontal control.

## 1.06 SUBMITTALS

### A. General

- 1. Submittals shall be made in accordance with Section 01330, Submittals, and as specified herein.
- 2. Submittals shall be coordinated with all relevant submittals, assembled and submitted as a single, comprehensive submittal.
- 3. Where calculations are required to be submitted, they shall be signed and sealed by the Contractor's Engineer. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information.
- 4. Provide written notifications as specified herein or within one workday.
- 5. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

### B. Product Data:

- 1. Include manufacturer's product description, installation requirements, shop drawings, operation, maintenance procedures, and samples where applicable, as well as description of methods and materials for installing and protecting the instruments, including post installation acceptance tests.
- 2. All instrument manufacturer's product data.

### C. Shop Drawings:

- 1. Site specific shop drawings indicating the layout and designation of all required control points and monitoring points as specified herein. Shop drawings shall demonstrate control points are outside the zone of influence determined by the Contractor. Provide linework indicating the anticipated zone of influence.

### D. Working Drawings: (Not Used)

### E. Method Statements:

- 1. Schedule for installation of monitoring instruments.
- 2. Description of monitoring instruments installation procedure.
- 3. Description of the proposed methods for monitoring each instrument type as specified herein.
- 4. All permits required for instrument installation.

5. Calculations for determining the anticipated zone of influence.
  6. Existing Conditions Assessment Plan: Plan shall include proposed methods of documenting visual observations, measurements, photographs, and descriptions of existing conditions within all Work Areas and Zones of Influence anticipated during construction of the trenchless crossing. All documentation shall be provided in pre- and post-construction Existing Conditions Assessment Reports. The reports will be used to note any potential ground movement and structure damage that is not recorded by the geotechnical instrumentation. The plan shall include methods for pre-construction and post-construction photographs that are taken from the public right-of-way, easements, and on properties where access permission has been granted. Post-construction photos shall be of the same orientation and lighting as the corresponding pre-construction photographs. Pre-construction and post-construction photographs shall be high-resolution, demonstrate the location and nature of the feature, include a scale, and display a date stamp of when the photograph was taken. The Existing Conditions Assessment Reports shall document the following site features:
    - a. The ground surface and drainage features;
    - b. Trees and vegetation;
    - c. Any structures;
    - d. Any utilities or appurtenances;
    - e. Highway 101 along the full crossing length, in a manner that settlement and cracking size and extent could be determined; and
    - f. Highway 101 Exit 503 signage.
- F. Quality Control Submittals
1. Plan:
    - a. Settlement Surveying and Monitoring Plan: The plan shall identify survey equipment; expected accuracy; and survey schedules, procedures, and reporting formats.
  2. Workforce Qualifications:
    - a. Provide qualifying experience record of the Contractor's:
      - 1) Engineer
      - 2) Surveyor
      - 3) Technicians
  3. Certificates: (NOT USED)
  4. Recordkeeping:
    - a. Submit baseline readings for all instruments within two workdays following readings and not less than three workdays preceding the commencement of any excavation.
    - b. All instrument readings in a cumulative record on the same workday as the readings are taken or as soon as data is known if excessive ground movement is suspected.
    - c. All interpretations within two workdays following readings.

- d. Provide monitoring reports with the following:
    - Data sheets containing a cumulative history of readings; including weather conditions, temperature, and proximity of the excavation to the instrument location itself at the time of each reading.
  - e. A plot of measured values versus time, including a time history of construction activity likely to influence such readings.
  - f. Existing Condition Assessment Reports: Provide pre-construction and post-construction reports.
5. Notifications:
- a. Provide notice to the Engineer not less than five workdays before instrument installations.
  - b. Provide all notifications described in this Section when a Contractor Action Value is reached.
  - c. Provide written notice within 24 hours if survey benchmarks have shifted from their pre-construction location.
6. As-Builts:
- a. As-builts within a minimum of two workdays following installation of each instrument.
  - b. Show installed locations, the instrument identification number, the instrument type, the installation date, installation time, established elevations, initial elevations, offset and stationing, initial coordinates, tip elevation and instrument length, when applicable. Show each instrument including installation records, depths, lengths, elevations, and dimensions of all key elements.
  - c. Signed and sealed cumulative records and interpretations by the Contractor's Engineer within 4 weeks following instrument removal.
  - d. Record of legal destruction of instruments within 4 weeks of instrument removal.

## 1.07 QUALITY ASSURANCE

### A. Qualifications:

- 1. Contractor's Engineer: A Professional Civil Engineer registered in the State of California with 5 years of experience in geotechnical instrumentation and monitoring.
- 2. Surveyor: Individual shall be a land surveyor licensed in the State of California for at least five years with at least two years of that experience in monitoring surveys.
- 3. Technicians: Individuals shall be qualified with a minimum of two years of experience in the installation of geotechnical instrumentation similar to those specified herein.

### B. Preconstruction Meeting: (NOT USED)

1.08 DELIVERY, STORAGE, AND HANDLING

- A. As recommended by instrument manufacturers.
- B. Upon delivery, check all instrumentation components for completeness and damage.

1.09 JOB CONDITIONS

- A. The anticipated ground conditions are set forth in the Geotechnical Data Report (GDR).

1.10 SEQUENCING AND SCHEDULING

- A. Ensure that instrumentation is installed, fully functional, calibrated, that all sets of baseline readings are taken, and that the instrumentation is ready for monitoring no later than 7 days prior to performing any excavation greater than 4 feet deep within 500 feet in plan of the designated instrumentation location.

1.11 WARRANTY (NOT USED)

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Steel pipe: ASTM A53
- B. Sand: Compatible with instrument manufacturer's written recommendations and ASTM C778.
- C. Cement: Shall be Type II Portland cement in accordance with ASTM C150 and compatible with instrument manufacturer's written recommendations.
- D. Water: Potable or Recycled.
- E. Cement-Bentonite Grout: 22 lbs cement; 12 lbs bentonite; 1.5-gal water, unless otherwise specified by instrumentation manufacturer.

2.02 EQUIPMENT

- A. Pavement Monitoring Points: As shown on the Drawings and approved by the Engineer.
- B. Optical Survey Target: As shown on the Drawings and approved by the Engineer.
- C. Utility Monitoring Points: As shown on the Drawings and approved by the Engineer.
- D. Monuments (Protective Enclosures):
  - 1. Furnish monuments with access cover and install at the ground surface to protect settlement casings. Use steel of sufficient strength to withstand HS-20 truck loadings. Provide a watertight access cover. Use an 8-inch ID traffic-rated monument with bolt-down cover at each installation location.
  - 2. Set monuments in place with concrete with 6-inch annular thickness around the monument or a 24-inch square casting.
  - 3. Inside each monument, install a hardened domed head nail embedded into concrete to serve as a leveling point.
  - 4. Grout monuments in place and paint with a bright orange paint. In areas where instrumentation is subject to damage by construction operation, install suitable barriers or guard posts as necessary to protect the monuments.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Perform all Work in accordance with accepted submittals and manufacturer's recommendations.
- B. Comply with all applicable permits.
- C. Provide the Engineer and City with access to the instrument locations. The City may periodically survey geotechnical instrumentation and compare settlement and displacement monitoring data with that provided by the Contractor.
- D. Installation of the instrumentation by the Contractor does not preclude the City, through an independent contractor, from installing instrumentation in, on, near, or adjacent to the construction work.
- E. Maintain a copy of the Contract Documents in a location acceptable to the Engineer and accessible to the Engineer.
- F. Ensure each instrument is functional for its intended purpose and installed in manner that protects the instrument from damage and the public from injury.
- G. Ensure that all instrumentation components are on hand and approved by the Engineer before excavation begins.
- H. Remove and replace any damaged instrument or component that affects the fit, form, or function of the instrument.
- I. Markings for each instrument identifying instrumentation name, location, and numbering shall be refreshed weekly or more frequently to ensure legible visibility of its location and unique identifier marking.
- J. Locate and avoid boring into or damaging conduits and other underground facilities in accordance with Section 02200, Site Preparation, before commencing work.
- K. Obtain permits as required for instrumentation installation.
- L. Prepare ground and surfaces for instrument installation.
- M. For access of areas outside public right-of-way, coordinate with City public liaison to obtain property owner or agency approval.

### **3.02 INSTALLATION**

- A. Installation of instruments shall be by approved Surveyor or Technicians.
- B. Label all instruments with the same identifying instrument number as shown on the Drawings or in a manner acceptable to the Engineer.
- C. Perform a baseline reading for each instrument which shall include at least three readings from each instrument before commencing excavations. Each baseline reading is to be completed on a different workday with a separate set-up. The readings are to provide statistically valid reproducible results allowing for temperature adjustments to both atmosphere and facility. If results are not valid, perform additional daily readings or re-install instrument until readings are reproducible.

- D. Pavement Monitoring Points (PMPs) and Optical Survey Targets (OSTs):
  - 1. PMPs shall be driven into the surface to be monitored such that the identification tag lies directly between the instrumented surface and the head of the nail. The identification number shall face up so it can be read.
  - 2. OSTs shall be installed in accordance with the manufacturer's instructions.
- E. Utility Monitoring Points (UMPs):
  - 1. Remove pavement over utility by coring or cutting. Minimize area of pavement removal.
  - 2. Excavate to top of utility using vacuum truck, hand auger, or other suitable method. Do not damage utility.
  - 3. Install temporary casing, trench box, or similar protective equipment as required to provide safe support and access for installation of settlement point.
  - 4. Clean top surface of utility.
  - 5. Install rod and outer casing as indicated on Drawings. Maintain centralized alignment throughout installation. Do not allow rod to contact the inside of the casing pipe.
  - 6. Install protective enclosure at pavement surface to accommodate traffic and prevent vandalism or other disturbance of measurement point.
  - 7. Grout the casing housing (if used) so it is in intimate contact with the ground.

3.03 FIELD QUALITY CONTROL (NOT USED)

3.04 INSPECTION, MAINTENANCE, AND REPAIR

- A. Protect instrumentation from damage during construction, and maintain instruments and components. Repair or replace instruments and components damaged during performance of work, to the satisfaction of the Engineer. Immediately notify Engineer of any damage or maintenance problems.

3.05 INSTRUMENTATION AND MONITORING

- A. Monitor instrumentation as specified in this Section.
- B. Perform visual observation of the ground surface during construction operations and note observations and changes.
- C. Perform additional monitoring as necessary to control construction and to ensure the safety of the work.
- D. Data or interpretation shall not be published or disclosed to other parties without advance written permission of the City.
- E. Perform baseline surveys and record the horizontal coordinates and elevations within an accuracy of 0.005 feet (1/16 inch) for each instrument location and all subsequent surveys. Reference survey control points so that they are accurately re-established if lost or destroyed.
- F. Perform readings for excavations at the frequency specified herein.

- G. Perform a final survey, with two readings similar to the baseline surveys, of all control points and instruments upon completion of construction operations.
- H. Surveys for monitoring geotechnical instrumentation shall be referenced to the same control points and benchmarks established for setting out the work. Tie survey control points to benchmarks and other survey monuments outside of the zone of influence of excavations.

### 3.06 SITE RESTORATION

- A. Restore damage to existing facilities, improvements, road surfaces, and highway pavement caused by construction-related settlement in excess of allowable maximums at no additional cost to the City. Obtain prior approval from the Engineer for any proposed repairs to roadways.
- B. Verify with Engineer that instrumentation is no longer required.
- C. Remove the instrument prior to substantial completion of the Work, unless otherwise indicated.
- D. Remove instrumentation in accordance with applicable permits.
- E. Backfill surface excavations with unshrinkable fill, when within apron, roadways, or sidewalks, and with selected fill when outside of such areas up to the underside of surface restoration.
- F. Surfaces affected by installation of instruments shall be restored to their original condition prior to completion of work.

**END OF SECTION**

## SECTION 02320

### TRENCHING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Trench excavation and backfilling for pipe and pipeline appurtenances.
- B. Minor structure excavation and backfill associated with pipeline construction.

##### 1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
  - 1. Section 01140 – Work Sequence and Constraints
  - 2. Section 01330 – Submittals
  - 3. Section 01550 – Traffic Control
  - 4. Section 02071 – Geotextile Fabric
  - 5. Section 02200 – Site Preparation
  - 6. Section 02210 – Subsurface Investigations
  - 7. Section 02241 – Control of Water
  - 8. Section 02261 – Pipeline Excavation Support and Protection
  - 9. Section 02953 – Pavement Restoration
  - 10. Section 03301 – Cast-in-Place Concrete
  - 11. Section 03600 –Grout

##### 1.03 DEFINITIONS

- A. Backfill: Earthwork necessary to provide fill between new structures and excavation up to the sub or finish grade.
- B. Bedding Zone: The area from the trench subgrade to the bottom of the pipe.
- C. Embedment or Pipe Zone: The area from the top of the Bedding Zone to the bottom of the Trench Zone as indicated on the Drawings.
- D. Excavation: Earthwork necessary to remove existing material for the installation of structures.
- E. Finish Grade: Final surface following placement of surfacing, if any, as indicated.
- F. Native Material: Naturally occurring soils excavated from the trench after top soil, if any, has been removed.
- G. Open Areas: Areas along the pipeline route that are outside roadway or in open pasture.
- H. Pavement Section: The upper portion of the trench within paved areas comprising the base and finished surface materials.
- I. Spoils: Unsuitable or excess excavated materials.

- J. Subgrade: The surface of the earthwork on which bedding, base materials, pavement, other surfacing materials, or structure bases are placed.
- K. Traveled Way: The portion of the roadway where vehicles travel, does not include shoulders.
- L. Trench Backfill: Materials used to backfill the trench including bedding zone, pipe zone, and trench zone backfill.
- M. Trench Zone: The area from the top of the Pipe Zone to the bottom of the pavement base (subgrade), ground surface or other surface material over the trench excavation.
- N. Wet Trench: Trench with water or groundwater present in the trench.

#### 1.04 SUBMITTALS

- A. Prepare submittals and submit in accordance with Section 01330.
- B. Material Data: Submit the following for each material type imported to the site:
  - 1. Material source.
  - 2. Gradation.
  - 3. Moisture-density curves.
  - 4. Permeability tests (for clay material).
- C. All material submittals must be dated to less than 1 year prior to Notice-to-proceed.
- D. For excavations 5 feet or deeper, submit detailed plan of all shoring, bracing, side sloping, or other provisions for worker protection against the hazard of caving ground during excavations in accordance with Section 02261.
- E. Submit name and qualifications of materials testing lab for Contractor furnished testing.

#### 1.05 QUALITY ASSURANCE

- A. Materials and compaction testing
  - 1. Source Testing of Materials: Provided and paid for by Contractor.
  - 2. Field Testing of Compaction: Provided and paid for by Contractor.
  - 3. Provide testing performed by a qualified testing laboratory approved by the Engineer. Submit testing laboratory qualifications for approval.
- B. Compaction Testing:
  - 1. In-place Density Testing of Compacted Fill Material: ASTM D6938 – Test Methods for Density of Soil and Soil Aggregate by Nuclear Methods (shallow depth).
  - 2. Maximum Dry Density:
    - a. Cohesive soils: Method C of ASTM D1557 – Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 10 lb Rammer and 18” Drop.
    - b. Cohesionless, free draining soils: ASTM D4253 – Test Methods for Maximum Index Density of Soils Using a Vibratory Table and D4254 – Test Methods for Maximum Index Density of Soils and Calculation of Relative Density.

C. Materials Testing Standards:

1. Particle size analysis of soils and aggregates: ASTM D422 – Method for Particle-Size Analysis of Soils.
2. Determination of sand equivalent value: ASTM D2419 – Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
3. Liquid limit, plastic limit, and plasticity index: ASTM D4318 – Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
4. Testing for organic matter: ASTM D2974 – Standard Test methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
5. Testing for percentage of fractured particles: ASTM D5821.
6. References in this section to soil classification types and standards: Meanings and definitions indicated in ASTM D2487 – Classification of Soils for Engineering Purposes.

**PART 2 - PRODUCTS**

2.01 MATERIALS

A. General:

1. Obtain trench backfill materials from one or more of the following:
  - a. Processed on-site materials,
  - b. Imported from off-site borrow areas,
  - c. Processing plants.
2. Provide materials as indicated or as may be necessary to complete the Work at no additional cost to the Engineer, unless a unit price item is included for trench backfill materials in the bidding schedule.
3. Provide materials as indicated in the Schedule in PART 3.
4. Soils unsuitable for use as trench backfill materials:
  - a. Soils classified under ASTM D2487 categories Pt, OH, CH, MH, or OL; or soils that contain classifications Pt, OH, CH, MH, or OL in combination with any other soil classification, such as CH/CL.
  - b. Soils which cannot be compacted sufficiently to achieve the density specified for the intended use, are highly expansive, or are unstable or "pump", regardless of the degree of compaction.
  - c. Soils that contain hazardous or designated waste materials including petroleum hydrocarbons, pesticides, heavy metals, and any material which may be classified as hazardous or toxic according to applicable Regulations.
  - d. Soils that contain greater concentrations of chloride or sulfate ions, or have a soil resistivity or pH less than the existing on-site soils.
  - e. Topsoil, except as allowed below.
  - f. Soils containing rocks, stones, or boulders larger than specified.

- g. Soils that contain more than 5 percent organic matter when tested in accordance with ASTM D2974.
  - B. Native Materials:
    - 1. Materials generated from on-site materials conditioned as follows:
      - a. Maximum particle size: 3 inches.
      - b. Percent passing No. 200 sieve: Less than 5 percent.
      - c. Sand equivalent: 30 minimum.
  - C. 3/8" Chips: Comply with the City of Healdsburg Specific Provisions, Section 10 Trenching and Backfill, Subsection 10.09 Backfill Materials, A. Bedding.
  - D. Sand (Only for Bedding of Electrical Conduits):
    - 1. General: Clean, coarse, natural sand free from organic material, suitable for the purpose intended.
    - 2. Gradation: 100 percent will pass 3/8" sieve, 90 percent to 100 percent will pass a No. 4 sieve and not more than 15 percent will pass a No. 200 sieve.
  - E. Aggregate Base: Comply with the City of Healdsburg Specific Provisions, Section 5 Aggregate Base.
  - F. Drain Rock: Comply with the City of Healdsburg Specific Provisions, Section 10 Trenching and Backfill, Subsection 10.09 Backfill Materials, D. 3/4" Drain Rock.
  - G. Filter Fabric: In accordance with Section 02071.
  - H. Concrete: In accordance with Section 03301
- 2.02 SOURCE QUALITY CONTROL
- A. Submit samples of all trenching materials used in the Work for testing by the Contractor. Perform source quality control testing by approved testing laboratory and submit results to Engineer.
  - B. Frequency of Sampling of Imported Material: After initial testing demonstrates that the proposed borrow material meets the specified requirements, obtain and submit one additional sample for every 500 cubic yards of imported material.

### **PART 3 - EXECUTION**

#### **3.01 EXISTING UTILITY LOCATIONS**

- A. Perform subsurface investigations to locate existing underground utilities in accordance with Section 02210.

#### **3.02 REMOVAL AND REPLACEMENT OF PAVEMENT**

- A. In paved areas, remove and replace pavement as follows unless otherwise indicated:
  - 1. Saw cut existing pavement along each side of the trench.
  - 2. Remove and dispose of the pavement lying within the limits of the saw cuts and from adjoining areas damaged by the cutting, removal, excavation and backfilling operations.

3. During subsequent trench excavation and backfill activities, minimize disturbance of the adjoining pavement.
4. Restore pavement surfaces in accordance with Section 02953.
5. Refer to drawings and Section 01140 for additional pavement removal and replacement requirements.

### 3.03 TRENCH EXCAVATION

#### A. General Requirements

1. Stabilize and support all faces of the trench excavation as specified in Section 02261.
2. Control groundwater as specified in Section 02241.
3. Clear, grub, and strip construction area as necessary to remove all vegetation and top soil as specified in Section 02200.
4. Adhere to requirements of agency having jurisdiction over the work within the public right-of-way

#### B. Open Trenches

1. Open Trench Limitations: Unless otherwise indicated or required by the Agency having jurisdiction limit open trenches as follows:
2. Travelled Way plus 3 feet either side:
  - a. Do not open more than 300 lineal feet of excavated trench at any one time during the Work shift.
  - b. Up to 50 feet of trench as measured at the surface may remain open during any non-work shift, provided:
    - 1) The entire trench opening is plated with steel plates, secured to avoid movement, and the edges backfilled with temporary pavement to provide a smooth transition.
    - 2) Shoring is installed to prevent collapse of the trench excavation.
3. Paved surfaces including road shoulders:
  - a. Do not open more than 300 lineal feet of excavated trench at any one time during the Work shift.
  - b. Up to 50 feet of trench as measured at the surface may remain open during any non-work shift provided the open trench is adequately plated, and the trench adequately shored.
4. Open areas: Do not open more than 300 lineal feet of excavated trench at one time.
5. Open Trench Safety Requirements:
  - a. Provide traffic control in accordance with Section 01550.
  - b. Erect traffic barricades and warning lights meeting safety requirements of City of Healdsburg and Sonoma County where open trench is within 12 feet of any travelled way.

- c. Erect signs to warn oncoming vehicles of rough road or steel plates in road, as appropriate.
  - d. Provide fencing or warning tape to protect the public from open trench in open areas.
- C. Trench Excavations
  - 1. Excavate trenches and maintain excavation such that pipe and pipeline accessories are installed in an open trench.
  - 2. Excavate to subgrade elevation and to trench width dimensions indicated on the Drawings.
  - 3. Excavate all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution of the trenching Work unless otherwise indicated.
  - 4. Where pipelines are to be installed in embankments, fills, or structure backfills, construct fill to a level at least one foot above the top of the pipe before the trench is excavated.
  - 5. Trench shield:
    - a. If a moveable trench shield is used during excavation operations widen the trench width so that the shield is free to be lifted and then moved longitudinally without binding against the trench sidewalls.
    - b. If the trench walls cave in or slough, the trench shall be excavated as an open cut excavation with sloped sidewalls or with trench shoring, as indicated and as required by the pipe structural design.
- D. Trench Bottom: Excavate and shape trench bottoms to provide uniform subgrade for placement of Bedding Material.
  - 1. Unsuitable Hard Trench Bottom: If bottom of excavation is found to consist of rock or any material that cannot be excavated to provide uniform bearing surface:
    - a. Notify Engineer of the conditions encountered and obtain concurrence that an unsuitable trench bottom condition is present.
    - b. Remove such rock or other material to a depth of not less than 6 inches below the original design elevation of the bottom of the trench.
    - c. Place bedding material or aggregate base course material to restore the trench bottom to the original design elevation. Place in lifts not exceeding 8 inches in un-compacted thickness and compact to 90 percent of maximum dry density.
  - 2. Unsuitable Soft Trench Bottom: If bottom of excavation is found to consist of soft or unstable material which is incapable of properly supporting pipe:
    - a. Notify Engineer of the condition encountered and obtain concurrence that an unsuitable trench bottom condition is present.
    - b. Remove such material to a depth and for the length required, as determined by the Engineer.

- c. Place bedding material or drain rock to restore the trench bottom to the original design elevation. If drain rock is used, Contractor shall wrap rock in geotextile fabric with 12" overlap.
- 3. Wet Trench
  - a. Where groundwater is present in the trench and observed by the Engineer, provide drain rock to restore the trench bottom to the original design elevation. Contractor shall wrap rock in geotextile fabric with 12" overlap.
- 4. Over-excavation
  - a. Over-excavation to a depth 6 inches or less below the design trench bottom shall be done at no additional cost to the Owner.
  - b. When the over-excavation ordered by Engineer is greater than 6 inches below the limits shown, additional payment will be made to Contractor. Additional payment will be made under separate unit price bid items for over-excavation.
  - c. Measurement and Payment:
    - 1) Measurement of quantities for payment of over-excavation will be by calculation by Engineer of the volume of materials removed as additional excavation, including additional material that must be excavated from slopes. Such calculation shall be based on the difference between dimensions before and after the additional excavation work. No compensation will be made for removal of materials beyond the limits of the additional excavation ordered by Engineer or for materials which may come into the excavation from outside the designated limits. No compensation will be made for removal of materials that are outside of the minimum horizontal dimensions indicated, even if Contractor has excavated wider than the minimum indicated.
    - 2) Payment for over-excavation will be made by the cubic yard. The payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in excavating and backfilling the over-excavation completely, to a level at the bottom of the pipe bedding indicated. Payment shall also include full compensation for the removal and disposal of the excavated materials, import and installation of the backfill materials, control of water in the excavation, excavation support, and all costs associated with the interruption of construction operations during the review of the foundations, excavation, backfill, and all other operations required for, or as a result of, over-excavation.
- 5. Over-excavation not ordered by the Engineer:
  - a. Any over-excavation carried below the grade ordered or indicated, shall be backfilled to the required grade with the indicated material and compaction. Such work shall be performed by Contractor at no additional cost to Owner.

### 3.04 EXCAVATION FOR VAULTS AND OTHER PIPELINE STRUCTURES

- A. Unless otherwise indicated, provide excavations sufficient to leave at least 12 inches clear between structure outer surfaces and the face of the excavation or any shoring which may be used to support the face of the excavation.
- B. Excavate to the subgrade soils beneath the bottom of the structure or bottom of crushed rock layer where indicated.
- C. Scarify the top subgrade soils to a depth of 6 inches, moisture condition, and re-compact to 90 percent of maximum dry density.

### 3.05 EXCAVATION IN VICINITY OF TREES

- A. Except where trees are indicated to be removed, protect trees from injury during construction.
- B. Do not cut tree roots over 2 inches in diameter without permission of the Engineer.
- C. Support trees during excavation by means approve by the Engineer.

### 3.06 WARNING TAPE INSTALLATION

- A. Install warning tape and tracer wire as indicated.
- B. Install warning tape centered on the pipe one (1) foot above the pipe unless otherwise indicated.
- C. Overlap warning tape ends a minimum of twelve (12) inches.

### 3.07 TRACER WIRE INSTALLATION

- A. Install tracer wire on all pipe unless otherwise indicated.
- B. Install tracer wire to form an electrically continuous line.
- C. Secure tracer wire to the top center of the pipe at a minimum interval of 5 feet and at each change in direction.
- D. Extend the tracer wire to the surface at valve boxes, hydrants, blow-off valves, air valves and other appurtenances and loop back to the pipeline such that there is a continuous wire from end to end. Provide 12 inch pigtail in the valve or appurtenance box and 12 inch pigtail adjacent to the base of hydrants.
- E. Provide 12 inch pigtail at the termination of each run of pipe included in the project. Where there is no appurtenance to be provided, install a valve box to contain the pigtail.

### 3.08 BEDDING ZONE

- A. Bedding Material: As scheduled herein or as indicated on the Drawings.
- B. Depth of Bedding Material: As indicated on the Drawings.
- C. Place Bedding Material in a single lift, and at uniform density, with minimum possible compaction. Grade material to allow installation of the pipe at the design elevations.
- D. Depressions for Assembly of Joints
  - 1. Dig holes for bell or coupling assembly after Bedding Material has been placed at the trench bottom and fine graded to the design elevation.

2. Create sufficient width and depth to provide ample room for tightening bolts, welding, or other joint assembly activities.
3. Excavate holes only as necessary in making joints. Ensure that pipe rests upon prepared trench bottom and is not supported by any portion of the joint.

### 3.09 PIPE ZONE

- A. Pipe Zone Material: As scheduled herein or as indicated on the Drawings.
- B. Dimensions of Pipe Zone Material: As indicated on the Drawings.
- C. After the pipe is laid, place material within the Pipe Zone in lifts:
  1. Place backfill only after all water is removed from the excavation and the trench sidewalls have been dried to a moisture content suitable for compaction.
  2. Immediately prior to placing backfill materials remove all loose, sloughing, or caving soils and rock materials from the trench.
  3. Place in lifts not exceeding 8 inches in un-compacted thickness and compact to 90 percent of maximum dry density. Maintain level backfill on each side of pipe.
  4. Do not dump backfill materials directly on the pipe.
- D. Pipe Displacement
  1. Take necessary precautions in placement and compaction of to prevent displacement of piping.
  2. In the event there is movement of the pipe, excavate and re-lay the pipe.
- E. Consolidation:
  1. Do not use water-settling methods to consolidate trench backfill materials.
  2. Use mechanical means, shovel slicing or vibratory compaction, to compact granular backfill materials under pipe haunches.

### 3.10 TRENCH ZONE

- A. Trench Zone Material: As scheduled herein or as indicated on the Drawings.
- B. Dimensions of Trench Zone Material: As indicated on the Drawings.
- C. The trench zone shall contain Class 2 Aggregate Base mechanically compacted to a minimum relative compaction of 95 percent.
- D. Backfill voids that may form when removing shoring and bracing.
- E. Do not use water-settling methods to consolidate Trench Zone Material.
- F. Under Existing Crossing Pipes or Conduits Larger than 3 Inches in Diameter
  1. Backfill from the top of the Pipe Zone to the spring line of the intersecting pipe or conduit with Aggregate Base or Pipe Zone material. Place in lifts not exceeding 8 inches in compacted depth and compact to 90 percent of maximum dry density.
  2. Extend Pipe Zone material 2 feet on either side of crossing pipe or conduit to 6 inches above the top of the crossing pipe.
  3. Backfill remainder of trench as described in this Section.

### 3.11 FINAL BACKFILL ZONE

- A. Unless indicated otherwise on the Drawings, restore the Site to the topography that existed prior to construction by excavation, compaction, finish grading and other earthwork operations, as necessary, for the areas affected by construction.
- B. Backfill with stockpiled topsoil in all areas where the original topsoil was removed as part of the site preparation and construction activities.
- C. Restore all drainage swales and water courses to their original alignments and grades.
- D. Install and maintain for a period of at least one year following completion of construction in any area, the facilities and management practices required by the Project Storm Water Pollution Prevention Plan.
- E. Install and maintain for a period of at least one year following completion of construction in any area, the measures required by the environmental permitting Drawings, permits, and approval documents of the agencies that have issued permits for construction of the Project.
- F. Inside road rights-of-way:
  - 1. Unless otherwise indicated on the Drawings or required by the agency having jurisdiction of the road right-of-way, complete trench backfill as follows:
    - a. Place in lifts not exceeding 6 inches in un-compacted depth.
    - b. Compact to 90 percent of maximum dry density except compact to 95 percent the upper 36 inches below the finished grade.
    - c. Replace aggregate base course to match existing aggregate base course thickness.
    - d. Replace final surface as indicated on the Drawings, match existing thickness, or as required by the agency having jurisdiction of the right-of-way, whichever is greater.
- G. Outside road rights-of-way:
  - 1. Areas with unpaved surfaces:
    - a. Place final backfill in lifts not exceeding 18 inches in un-compacted depth and compact to 85 percent of maximum dry density.
    - b. In Open Areas, replace topsoil with material that was removed and stockpiled prior to trench excavation.
  - 2. Paved areas or driveways:
    - a. Backfill in lifts not exceeding 12-inches in un-compacted depth and compact to 90 percent maximum dry density except compact the upper 12 inches to 95 percent.
    - b. Replace final surface as indicated on the Drawings or match existing thickness, whichever is greater.
    - c. Replace driveway materials in kind.
    - d. Match pre-construction condition or better.
    - e. Smooth and compact material as required to create a smooth and firm driving surface.

### 3.12 STRUCTURE BACKFILL

- A. Provide Structure Backfill material within 12-inches of all structures to be backfilled unless otherwise indicated.
- B. Place a 6-inch layer of 3/4-inch or 1-inch Crushed Rock below all structures, unless otherwise indicated.
- C. Do not drop backfill upon any structure or pipe.
- D. Confirm concrete structures have attained sufficient strength to withstand the backfill loads imposed prior to placing backfill.
- E. Do not place backfill around water retaining structures until structures have been tested and approved for backfill. Fill structures with water during backfill operations.
- F. Place backfill after all water has been removed from the excavation and the excavation sidewalls and subgrade soils have dried to a moisture content suitable for compaction.
- G. Remove all loose, sloughing, or caving soils and rock materials prior to placement of backfill.
- H. Place geotextile fabric as indicated.
- I. Promptly after removal, fill voids created by the extraction of sheetpile or shoring with sand-cement grout that conforms to Section 03600.
- J. Place backfill and spread evenly in layers so that when compacted layers do not exceed thickness indicated.
- K. Thoroughly mix layers as necessary to promote uniformity of material in each layer.
- L. Add water to backfill material where moisture content is below the optimum moisture content and mix with the soil until the proper moisture content is achieved throughout the soil layer.
- M. Compact backfill to 90 percent of maximum dry density except compact to 95 percent the upper 36 inches below the finished grade.

### 3.13 COMPACTION REQUIREMENTS

- A. Compaction requirements specified herein are in-place densities of compacted backfill.
- B. Adhere to requirements of agency having jurisdiction over the work within the public right-of-way
  - 1. City of Healdsburg – Adhere to City Standard Requirements
  - 2. County of Sonoma – Adhere to Sonoma County construction standard 219B, Type B percentage. Backfill lifts and compaction results to be completed in 8 inch layer per Caltrans Standard Specification 19-6.03C.
  - 3. Caltrans – Adhere to Caltrans Standard Requirements
- C. Initial Trench Backfill Compaction Demonstration
  - 1. Demonstrate adequacy of compaction equipment and procedures before exceeding 300 lineal feet of trenching work.

2. Continued Compaction Requirements: When specified degree of compaction is achieved, proceed with trenching and backfilling activities using the established equipment and procedures.

### 3.14 DISPOSAL OF SPOILS

- A. Dispose of spoils and unsuitable materials in a lawful manner at an off-site location.
- B. Do not dispose of spoils within temporary or permanent easements.
- C. A spoils disposal area has not been identified for this project. It is Contractor's responsibility to identify spoils disposal areas and to negotiate all agreements necessary and pay all costs to dispose of spoils.
- D. Obtain written permission and landowner agreements that allows the disposal of spoils and contains language that states that Owner, Engineer, and Design Consultant shall not be liable for any claims or damages resulting from Contractor's use of properties for disposal of spoils.
- E. Prior to removal of any materials from the project site, provide copies of permits, landowner agreements, and approvals to Engineer.

### 3.15 FIELD QUALITY CONTROL

- A. Cost of compliance testing: By Contractor.
- B. Contractor's responsibilities:
  1. Coordinate compaction testing and compliance with agency having jurisdiction over the Work within the public right-of-way.
  2. Submit copies to the Owner of compaction testing results for compaction testing conducted by others.
  3. Remove overburden above level at which the Engineer wishes to test.
  4. Provide trench support and groundwater removal.
  5. Backfill and re-compact material after testing is completed.
  6. If compaction fails to meet specified requirements, perform remedial work by one of the following methods:
    - a. Remove and replace backfill at proper density.
    - b. Bring density up to specified level by other means acceptable to the Engineer.
    - c. Redo trench backfill compaction demonstration and demonstrate compaction process achieves required results.
    - d. Costs of retesting to confirm compliance: By the Contractor.
- C. Compaction Testing (Contractor Furnished):
  1. Coordinate compaction testing and compliance with agency having jurisdiction over the Work within the public right-of-way.
  2. Submit copies of compaction testing results to the Owner.
  3. If compaction fails to meet specified requirements, perform remedial work by one of the following methods:

- a. Remove and replace backfill at proper density.
  - b. Bring density up to specified level by other means acceptable to the Engineer.
  - c. Redo trench backfill compaction demonstration and demonstrate compaction process achieves required results.
- D. Frequency of trench backfill compaction confirmation testing:
- 1. Each test location: Perform tests for each type or class of backfill from bedding to finish grade.
  - 2. Open fields: 1 tests every 1,000 linear feet.
  - 3. Non-paved roadways: 1 tests every 500 linear feet.
  - 4. Crossing paved roadways: 2 tests at each crossing.
  - 5. Inside road rights-of-way:
    - a. 1 test every 300 linear feet.
    - b. As required by the Agency having jurisdiction over the right-of-way.

### 3.16 SCHEDULE

- A. Construct pipeline using materials specified in the following schedule. Where options are provided, Contractor may select materials from the materials listed.
- 1. Bedding Zone:
    - a. 3/8" Chips
  - 2. Wet Trench:
    - a. 3/4" Drain Rock, wrapped with filter fabric
  - 3. Embedment Zone:
    - a. 3/8" Chips
  - 4. Trench Zone:
    - a. Class 2 Aggregate Base
- B. Structure Backfill:
- 1. Bedding:
    - a. Crushed Rock (1- or 3/4-inch)
    - b. Class 2 Aggregate Base.
  - 2. Structure Backfill:
    - a. Structure Backfill Material
    - b. Class 2 Aggregate Base.

**END OF SECTION**

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**SECTION 02401**  
**STEEL CASING PIPE**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES:

- A. Specifications for steel casing pipe to be installed by horizontal auger boring as described in Section 02446, Horizontal Auger Boring.
- B. Furnish all designs, tools, equipment, materials, and supplies and perform all labor required to complete the Work as indicated on the Drawings and specified herein.

1.02 REFERENCED SECTIONS:

- A. Section 01330 – Submittals
- B. Section 02446 – Horizontal Auger Boring

1.03 REFERENCED STANDARDS

- A. General:
  - 1. The following documents form part of the Specifications to the extent stated. Bring conflicts between Specifications, Drawings, and the referenced documents to the attention of the City, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the most stringent shall apply.
  - 2. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual or test designation in effect the date the Notice to Proceed with the Work is given.
- B. AASHTO LRFD Bridge Design Specifications
- C. ASTM International:
  - 1. ASTM A36 – Standard Specification for Carbon Structural Steel
  - 2. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- D. American Welding Society
  - 1. ANSI/AWS D1.1 – Structural Welding Code – Steel
- E. Caltrans Encroachment Permit Underground Utility Provisions

1.04 DEFINITIONS

- A. See Section 02446, Horizontal Auger Boring.

1.05 SYSTEM DESCRIPTION

- A. Design Requirements:
  - 1. The Contractor shall select a casing diameter to fit their means and methods, subject to acceptance by the Engineer, and that it meets or exceeds the minimum nominal diameter indicated in the Drawings.

2. Jacking force loads shall be determined in accordance with Section 02446, Horizontal Auger Boring.
3. Highway loads shall be determined in accordance with AASHTO standards.
4. The selected thickness of steel casing pipe shall be of sufficient thickness and axial strength to withstand the forces to be encountered during the installation process, with a minimum factor of safety of 2.0, while meeting the thickness requirements of the Drawings.
5. Casing pipe shall comply with Caltrans Encroachment Permit Underground Utility Provisions (TR-0163).

B. Performance Requirements: (NOT USED)

1.06 SUBMITTALS

A. General:

1. Submittals shall be made in accordance with Section 01330, Submittals, and as specified herein.
2. Submittals shall be coordinated with all relevant submittals, assembled and submitted as a single, comprehensive submittal.
3. Where calculations are required to be submitted, they shall be signed and sealed by the Contractor's Engineer. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information.
4. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

B. Product Data:

1. Submit manufacturer's mill specification sheet listing diameter, thickness, and class of steel used in making the casing, and the mill certification.
2. Submit manufacturer's pipe handling instructions.
3. Submit the pipe manufacturer's recommendations for joint connections, repairs for joint failures, and repairs for sidewall failure.

C. Shop Drawings:

1. Casing lay length, joint detail, shop welding details, and prefabricated grout/lubrication ports.
2. Grout/lubrication port plug.

D. Work Drawings:

1. Joint field welding detail.

E. Method Statements:

1. Calculations:

- a. Provide the maximum anticipated loads, including: earth loads, live loads, highway loads, jacking force loads, contact grouting loads, and handling loads to be imposed on the casing pipe.
- b. Calculations demonstrating that the casing pipe has been designed to support the maximum anticipated loads with specified factor of safety.

F. Quality Control Submittals:

1. Plan: (NOT USED)
2. Workforce Qualifications:
  - a. Contractor's Engineer.
3. Certificates:
  - a. Welder qualifications and third-party certification of a welding test standard for pipe acceptable to Engineer.
  - b. Submit a certificate of compliance that verifies the pipe complies with the project specifications, including pipe design data and tolerances.
4. Record Keeping: (NOT USED)
5. Notifications: (NOT USED)
6. As-Builts: (NOT USED)

1.07 QUALITY ASSURANCE

A. Qualifications:

1. All welding procedures used to fabricate steel casings shall be prequalified under the provisions of ANSI/AWA D1.1. All welding shall be performed by skilled welders, welding operators and tackers, experienced in the type of materials to be used. Welders shall be qualified under the provisions of ANSI/AWA D1.1 by an independent local, approved testing agency not more than six (6) months prior to commencing work on the casing.
2. Contractor's Engineer shall demonstrate qualified experience performing similar calculations for a similar installation method.
3. Experience records shall include project name, project owner's name, project owner's contact information, project description including casing size, length, purpose of undercrossing, carrier pipe material, carrier pipe service type, and soil type by USCS system including N-value and ground water level.
4. Experience records shall include five (5) projects in the last five (5) years and all projects demonstrating the specified experience.

B. Preconstruction Meeting: (NOT USED)

1.08 DELIVERY, STORAGE AND HANDLING (NOT USED)

1.09 JOB CONDITIONS (NOT USED)

1.10 SEQUENCING AND SCHEDULING (NOT USED)

1.11 WARRANTY (NOT USED)

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

#### **A. Casing Pipe:**

1. Provide casing as required by the Drawings.
2. The wall thickness of casing passing under highway facility right-of-way shall not be less than that allowed by the governing agency of the facility. Steel casing shall conform to the requirements of Caltrans' Encroachment Permit.
3. Provide casing that is specifically manufactured for the Contractor's trenchless pipeline installation method with a smooth outer wall and is manufactured to the following dimensional criteria:
  - a. Circumference < 0.5%
  - b. Exterior Roundness < 0.5%
  - c. End Squareness +/- 1/16 in
  - d. Straightness < 1/8 in
  - e. Pipe Length +/- 1/4 in
4. Comply with ASTM A36, minimum.

#### **B. Casing Pipe Joints:**

1. All casing segments shall be joined by continuous, full circumference, full penetration butt welds or Permalok™ joint, or approved equal. Welds shall be water-tight.
2. Stress transfer shall be provided across the joints for the full jacking forces involved.
3. Welds shall be ground smooth on the side of the casing to provide smooth bore and shall not extend more than 1/4-inches beyond pipe outside diameter.

#### **C. Contact Grout and Lubrication Ports:**

1. Grout ports are to be standard 2-inch ports.
2. Provide at ports on casing pipe at the spacing shown on the Drawings, at minimum.
3. Grout ports are to be preinstalled and of a design that does not impact trenchless installation method.
4. Ports to be staggered to the left and right of the top longitudinal axis of the pipe as shown on the Drawings.
5. Provide weldable port plug at each port.

### **2.02 EQUIPMENT (NOT USED)**

## **PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 02436**  
**CONTACT GROUTING**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section includes:

1. Minimum requirements for contact grouting of the annular space of casing pipe installed by trenchless methods.
2. Furnish all designs, tools, equipment, materials, and supplies and perform all labor required to complete the Work as indicated on the Drawings and specified herein.

1.02 REFERENCED SECTIONS:

- A. Section 01330 – Submittals
- B. Section 02446 – Horizontal Auger Boring

1.03 REFERENCE STANDARDS

A. General:

1. The following documents form part of the Specifications to the extent stated. Bring conflicts between Specifications, Drawings, and the referenced documents to the attention of the City, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the most stringent shall apply.
2. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual or test designation in effect the date the Notice to Proceed with the Work is given.

B. ASTM International:

1. ASTM C31 – Standard Practice for Making and curing Concrete Test Specimens in the Field
2. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
3. ASTM C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-inch Cube Specimens)
4. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar
5. ASTM C150 – Standard Specification for Portland Cement
6. ASTM C937 – Standard Specification for Grout Fluidifier for Preplaced-Aggregate Concrete

C. NSF/ANSI Standard 60 – Drinking Water Treatment Chemicals – Health Effects

1.04 DEFINITIONS:

- A. See Section 02446, Horizontal Auger Boring.

## 1.05 SYSTEM DESCRIPTION

### A. Design Requirements:

1. Place contact grout in the annular space between the outside of the casing and excavated ground and where voids are anticipated or created.
2. Grout mix (water-cement) ratios shall be expressed in cubic feet of water per cubic foot of cement (94-pound bag). The water-cement ratio by volume shall be varied as needed to fill the voids outside the casing. The range of water-cement ratios shall be between 1:1 and 2:1 by volume.
3. Grout shall consist of Portland cement, not more than 2 percent bentonite by weight of cement, fluidizer as necessary, and water in the proportions specified herein or acceptable to the Engineer. Sand is an allowed additive to the grout mix in instances of very high grout takes, more than 1 cubic yard, or as accepted by the Engineer. The grout mix shall be limited to 1-part Portland cement to 5-parts sand by volume. In no case shall the grout mix contain less than six sacks of cement per cubic yard of grout. The addition of water or fluidizer is permitted when sand is added to the grout mix.
4. Maximum allowable injection pressure shall not exceed 5.0 psi.

### B. Performance Requirements:

1. Provide grout with a minimum unconfined compressive strength (UCS) of 100 pounds per square inch (psi) in 24 hours, 500 psi in 7 days, and 1,000 psi in 28 days.

## 1.06 SUBMITTALS

### A. General:

1. Submittals shall be made in accordance with Section 01330, Submittals, and as specified herein.
2. Submittals shall be coordinated with all relevant submittals, assembled and submitted as a single, comprehensive submittal.
3. Where calculations are required to be submitted, they shall be signed and sealed by the Contractor's Engineer. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information.
4. Provide written notifications as specified herein or within one workday.
5. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

### B. Product Data:

1. Details of grout mix proportions, admixtures, including manufacturer's literature, and laboratory test data verifying the strength and set time of the proposed grout mix.
2. Material Safety Data Sheets.
3. Results of grout strength tests for proposed mixes.

- C. Shop Drawings:
  - 1. Grout port one-way valves assemblies.
- D. Working Drawings:
  - 1. Grout piping diagram from mixing tank to point of injection.
- E. Method Statements:
  - 1. Calculations confirming planned injection pressures and maximum injection pressures at each point of injection.
  - 2. Contact grouting methods and details of equipment, grouting procedures and sequences, monitoring and recording equipment, methods of measuring and controlling grout pressure, methods of measuring placed volume, and provisions to protect pipe lining or pit supports.
  - 3. Schedule for all grouting operations and associated works by reach. Schedule shall be coordinated with overall schedule for the Contract.
  - 4. Procedure for disposing of unused grout and flushing lines.
  - 5. Sample Daily Grouting Log.
- F. Quality Control Submittals:
  - 1. Plan: (NOT USED)
  - 2. Workforce Qualifications:
    - a. Contractor's Engineer.
  - 3. Certificates: Certificate, dated with six months of use, from an independent laboratory that the calibration gauge is accurate to 1 psi.
  - 4. Record Keeping:
    - a. Daily Grouting Logs one work day after injection. Logs shall include:
      - 1) Start and finish times.
      - 2) Name of logger.
      - 3) Diameter of port.
      - 4) Station of hole and clock position.
      - 5) Groundwater inflow rate for each hole, if any.
      - 6) Groundwater backpressure for each hole, if any.
      - 7) Mix type and injection time for each hole.
      - 8) Identify holes which are "communicating" or "venting" for a specific grout connection.
      - 9) Amount of cement injected (bags or lbs.).
      - 10) Gauge pressure.
      - 11) Reason to stop injection in each grout hole.
    - b. Cumulative test reports for each break within one work day after break.
  - 5. Notifications: Notify the Engineer at least one work day in advance of starting contact grouting operations.

6. As-Built: (NOT USED)

1.07 QUALITY ASSURANCE

A. Qualifications:

1. Contractor’s Engineer shall be a professional engineer licensed by the State of California. Experience of the engineer shall include five (5) projects within the last five (5) years performing similar grout pressure or hydrofracture calculations.
2. Sample testing shall be performed by a certified laboratory.

B. Preconstruction Meeting: (NOT USED)

1.08 DELIVERY, STORAGE AND HANDLING (NOT USED)

1.09 JOB CONDITIONS (NOT USED)

1.10 SEQUENCING AND SCHEDULING (NOT USED)

1.11 WARRANTY (NOT USED)

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Cement: Cement shall be Type II or Type V Portland cement conforming to ASTM C150.
- B. Bentonite: Bentonite shall be a commercially processed powdered bentonite, Wyoming type; NSF/ANSI Standard 60 compliant.
- C. Water: Potable or reclaimed (recycled).
- D. Sand: Conform to ASTM C144 except:
  1. Fineness modulus: Between 1.50 and 2.00 and Grading Requirements:

Sieve Sizes	Percentage passing by Weight
No. 8	100
No. 16	95-100
No. 30	60-85
No. 50	20-50
No. 100	10-30
No. 200	0-5

- E. Fluidizer: Fluidizers, or fluidifiers, shall hold the solid constituents of the grout in colloidal suspension, be compatible with the cement and water used in the grouting work, and comply with the requirements of ASTM C937.
- F. Admixtures: Shall be accepted by the Engineer. If commercially available and acceptable to the product manufacturer all polymers, and additives, other than soda ash, shall be NSF/ANSI Standard 60 compliant.

2.02 EQUIPMENT

- A. Equipment for mixing and injecting grout shall be adequate to satisfactorily mix and agitate the grout and pump it into the annular space at a constant pressure.

- B. Provide a pressure gauge at the grout port. Periodically check the accuracy of the gauge with an accurately calibrated pressure gauge. Provide a minimum of two spare pressure gauges available on site at all times.
- C. Provide a flow meter to determine the volume of grout injected. Calibrate the meter in cubic feet to the nearest one-tenth of a cubic foot.
- D. Provide grouting hoses with an inside diameter of not less than 1 ½ inches or not more than 2 inches and capable of withstanding twice the maximum external water and grout pressures to be used.
- E. Provide injection system with a grout recirculation hose.
- F. Provide one-way grout injection valves.
- G. Maintain the grouting equipment in satisfactory operating condition throughout the course of the work to ensure continuous and efficient performance during grouting operations.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. Perform all work in accordance with accepted submittals.
- B. Control the grout pressure so as to avoid damaging the jacking pipe, and to avoid movement of the surrounding ground or structures.
- C. Perform all grouting operations in the presence of the Engineer and provide the City with access to the grouting operations.
- D. Maintain a copy of the Contract Documents at a location acceptable to the Engineer and accessible to the grout operator and Contractor's Engineer.
- E. Prevent spilling or escaping of grout to the ground surface or into another underground facility. Closely monitor grouting operations to detect any spills or escape of grout to the surface or into another underground facility. Any such spill shall be immediately contained and cleaned-up.
- F. During grouting work, provide for adequate disposal of all waste and wastewater. Remove and properly dispose of all waste grout resulting from grouting operations. The contents of grout lines shall only be discharged into an appropriate container located on the surface.

#### **3.02 INSTALLATION**

- A. Mixing and Injection of Grout
  - 1. Provide materials free of lumps when added to the mixer.
  - 2. Agitate the grout mix continuously.
  - 3. Grout shall flow unimpeded and shall completely fill all of the annular space and voids.
  - 4. Make a hookup to every grout port.

5. Dispose of unused grout and flushed grout in accordance with established procedures.
  6. Re-circulate grout mixes when any new previously approved mix is batched. Re-circulate the mix for at least 2 minutes prior to pumping grout into the grout ports.
  7. Progress with grouting sequentially in a constant up-gradient direction.
  8. Immediately upon completion of the casing installation, attempt to perform contact grouting through the ports. Attempt to force cement grout into the space outside the casing to fill voids to refusal at the maximum allowable pressure in accordance with this Section.
  9. Grouting in any single port shall be considered completed when less than 1.0 cubic foot of grout, of the accepted mix and consistency, is pumped in 5 minutes under the submitted maximum injection pressure or if grout flows through the next grout port, or pit at the same rate as the rate of pumping.
  10. Dispose of grout not injected after 90 minutes of mixing.
- B. Once contact grouting is complete:
1. Place and fully weld each grout port plug to prevent any water seepage.
  2. Grind any material from inside casing that may impede on carrier pipe insertion.

### 3.03 FIELD QUALITY CONTROL

- A. Testing:
1. Take grout for the cylinders or cubes from the nozzle of the grout injection line. Provide at least one set of four (4) samples for each 100 cubic feet of grout injected, but not less than one set for each batch in accordance with ASTM C31.
  2. Prepare and test grout samples for 24-hour, 7-day, and 28-day compressive strength tests according to ASTM C39 for cylinders or ASTM C109 for cubes.

### 3.04 INSPECTION, MAINTENANCE, AND REPAIR (NOT USED)

### 3.05 INSTRUMENTATION AND MONITORING (NOT USED)

### 3.06 SITE RESTORATION

- A. Clean grout and any deleterious material from inside the casing.
- B. Remove and properly dispose of all waste materials.

**END OF SECTION 02436**

**SECTION 02446**  
**HORIZONTAL AUGER BORING**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. All designs, labor, machinery, material, construction equipment and appurtenances required to conduct a trenchless installation of a casing pipe using horizontal auger boring (HAB) methods at designated locations in a manner that demonstrates good workmanship.

1.02 REFERENCED SECTIONS

- A. Section 01330 – Submittals
- B. Section 01560 – Environmental Controls
- C. Section 02260 – Excavation Support and Protection
- D. Section 02306 – Geotechnical Instrumentation and Monitoring
- E. Section 02401 – Steel Casing Pipe
- F. Section 02436 – Contact Grouting
- G. Section 02449 – Carrier Pipe Installation into Casing
- H. Section 03600 – Backfill Grout
- I. Section 15145 – Polyvinyl Chloride (PVC) Pressure Pipe

1.03 REFERENCED STANDARDS

- A. General:
  - 1. The following documents form part of the Specifications to the extent stated. Bring conflicts between Specifications, Drawings, and the referenced documents to the attention of the City, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the most stringent shall apply.
  - 2. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual or test designation in effect the date the Notice to Proceed with the Work is given.
- B. NSF/ANSI Standard 60 – Drinking Water Treatment Chemicals – Health Effects
- C. ASTM International:
  - 1. ASTM D1586 – Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils
- D. Caltrans Encroachment Permit
- E. Federal Emergency Management Agency (FEMA) – FEMA Flood Maps and Zones

## 1.04 DEFINITIONS

- A. Annular Space (Annulus): The theoretical volume created by the radial distance between the smallest outside radius allowed in the tolerance of the jacking pipe and the maximum radius of excavated ground along the length of the installation.
- B. Carrier Pipe: The permanent pipe which conveys the product intended to be transported. The carrier pipe may be cased for trenchless crossings.
- C. Casing: A jacking pipe which supports a bore. The casing is not a carrier pipe. The carrier pipe is constructed within the casing.
- D. Contact Grouting: Grouting outside of the jacking pipe to fill the annular space and voids and to assure that intimate contact for load transfer between the jacking pipe and the native host material has been achieved.
- E. Cutter head: The actual teeth and supporting structure that is attached to the front of the lead auger. It is used to reduce the material that is being bored to sand or loose dirt so that it can be conveyed out of the jacked pipe.
- F. Dewatering: The act of removing groundwater for lowering the groundwater elevation using a system of wells and pumps.
- G. Down Time: Time lost when the trenchless equipment is unable to operate; generally associated with equipment failure.
- H. Drive: Designation of the jacking pipe installed from a jacking pit to a receiving pit.
- I. Exit Pit: See Receiving Pit.
- J. Face: the location where excavation is taking place.
- K. Face Pressure: Earth and groundwater pressures applied against the cross-sectional area of the face.
- L. Factor of Safety: A ratio between the structural capacity of a system divided by expected loads or actual loads.
- M. Grouting: The process of filling voids or modifying/improving ground conditions. Grouting materials may be cementitious, chemical, or other mixtures.
- N. Heave: Measurable upward movement of the ground or structure as the result of the excavation process.
- O. Horizontal Auger Bore (HAB): A technique for forming a bore from a jacking pit to a reception pit by a rotating cutterhead concurrent with pipe jacking. Spoil is removed back to the jacking shaft by helically wound auger flights rotating in the jacking pipe. The term "Bore and Jack" is the same as HAB for this project.
- P. Jacking Force: The total force required to overcome the face pressure component and frictional resistance component along the jacking pipe string to allow the forward movement of the jacking pipe string.
- Q. Jacking Loads: See Jacking Force.
- R. Jacking Pipe: Pipe designed to be installed using pipe jacking techniques.

- S. Jacking/Launch Pit: Excavation from which trenchless technology equipment is launched for the installation of a pipeline. The jacking/launch pit may incorporate a thrust wall to spread reaction loads to the ground and an entry ring to control inflows of groundwater and ground at the portal.
- T. Inadvertent Returns: The loss of lubrication from lubrication system. A special form of inadvertent return, where the fluid exceeds the strength and confining pressure of the ground and reaches the surface or waterway, is called a hydrofracture or “frac-out.”
- U. Leading Edge: The first segment of the pipe string as the casing is advanced, usually either a pre-fabricated soil-cutting shoe or a special band welded around the jacking pipe.
- V. Lubrication: The act of injecting a fluid, normally bentonite and/or polymers, used to reduce the skin friction and jacking forces on the jacking pipe during installation. The fluid fills the annular space.
- W. Maximum Allowable Jacking Force: The largest jacking force that can be applied to the jacked pipe, allowing for an appropriate factor of safety.
- X. Maximum Anticipated Jacking Force: The largest anticipated jacking force required to advance jacking pipe along a drive.
- Y. Obstruction: Any buried object that lies completely or partially within the cross-section of the face and prevents continued forward progress along the design path and allowable tolerances after diligent efforts by the Contractor.
- Z. Penetration resistance of soil based on SPT blow counts, N, performed per ASTM D1586:

Compactness of coarse-grained soils (e.g. sands)	Consistency of fine-grained soils (e.g. clays)
Very Loose: N = 0 to 4	Very Soft: N < 2
Loose: N = 4 to 10	Soft: N = 2 to 4
Medium: N = 10 to 30	Medium: N = 4 to 8
Dense: N = 30 to 50	Stiff: N = 8 to 15
Very Dense: N > 50	Very Stiff: N = 15 to 30
	Hard: N > 30

- AA. Pipe Jacking: A system of directly installing jacking pipes behind a trenchless excavation machine by hydraulic jacking from a jacking pit such that the joined pipe segments form a continuous string in the ground.
- BB. Pipe Lubricant: See Lubrication.
- CC. Pipe String: The succession of joined individual jacking pipe segments being used to advance and support the excavation.
- DD. Pre-Treated Ground: Grouted or otherwise stabilized ground used to prevent ground deformation or inflows, groundwater inflows, or to stabilize existing features.
- EE. Product Pipe: See Carrier Pipe
- FF. Receiving/Exit Pit: Excavation into which the trenchless equipment is driven and recovered.

- GG. Settlement: Measurable downward movement of the ground, overlying utility, or other structure as the result of the excavation process or dewatering.
- HH. Spoil: Earth, rock, and other materials excavated during the trenchless process.
- II. Surface Settlement Points: Survey control points established at the ground surface along the pipe alignment for monitoring surface movement resulting from subsurface excavation.
- JJ. Trenchless: A technique for underground pipeline and utility construction, replacement, or renewal, without excavation from the ground surface.
- KK. Tunnelman's Ground Classification:
  1. Firm: Heading can be advanced without initial support, and final lining can be constructed before ground starts to move.
  2. Raveling: Chunks or flakes of material begin to drop out of the arch or walls sometime after the ground has been exposed, due to loosening or to over-stress and "brittle" fracture (ground separates or breaks along distinct surfaces, opposed to squeezing ground). In fast raveling ground, the process starts within a few minutes, otherwise the ground is slow raveling.
  3. Running: Granular materials without cohesion are unstable at a slope greater than their angle of repose ( $\pm 30^{\circ}$ - $35^{\circ}$ ). When exposed at steeper slopes they run like granulated sugar or dune sand until the slope flattens to the angle of repose.
  4. Flowing: A mixture of soil and water flows into the tunnel like a viscous fluid. The material can enter the tunnel from the invert as well as from the face, crown, and wall, and can flow for great distances, completely filling the tunnel in some cases.
  5. Squeezing: Ground squeezes or extrudes plastically into tunnel, without visible fracturing or loss of continuity, and without perceptible increase in water content. Ductile, plastic yield and flow due to overstress.
  6. Swelling: Ground absorbs water, increases in volume, and expands slowly into the tunnel.

## 1.05 SYSTEM DESCRIPTION

- A. Design Requirements:
  1. Steel casing pipe shall be installed by Horizontal Auger Boring to the minimum extent shown on the Drawings.
  2. Contractor shall select the excavated diameter to fit their means and methods as long as the selected diameter complies with the Caltrans Encroachment Permit and enables the installation of casing pipe in accordance with Section 02401, Steel Casing Pipe, and the carrier pipe in accordance with Section 02449, Carrier Pipe Installation into Casing.
  3. Contractor shall be fully responsible for the structural sufficiency of the casing and the placement thereof. The details shown on the Drawings are to be considered minimum requirements only.
  4. Unless otherwise specified, the methods and equipment used in horizontal auger boring shall be determined by the Contractor, provided that the proposed

method is approved by Engineer and meets the Caltrans Encroachment Permit requirements. Such approval, however, shall in no way relieve Contractor of the responsibility for meeting the requirements of the Contract Documents.

5. Additional Caltrans Requirements:
  - a. Wing cutters when used shall only add a maximum of 1" in diameter to the outside diameter of the encasement pipe. Voids in excess of the Standard Specifications shall be grouted.
  - b. A band welded to the leading edge of the encasement pipe should be placed square to the alignment and not on the bottom edge of pipe. A flared lead section on bores over 100' shall not be permitted.
  - c. The length of the auger strand shall be equal to that of the section of encasement pipe.

B. Performance Requirements:

1. Installation tolerances:
  - a. Vertical: 1.5-feet per 100 linear feet of jacked casing.
  - b. Horizontal: 1.5-feet per 100 linear feet of jacked casing.
2. Maximum settlements:
  - a. As specified in Section 02306, Geotechnical Instrumentation and Monitoring.

## 1.06 SUBMITTALS

A. General:

1. Submittals shall be made in accordance with Section 01330, Submittals, and as specified herein.
2. Submittals shall be coordinated with all relevant submittals, assembled and submitted as a single, comprehensive submittal.
3. Where calculations are required to be submitted, they shall be signed and sealed by the Contractor's Engineer. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information.
4. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

B. Product Data:

1. Manufacturer literature and material data safety sheets for all jacking pipe lubricants.
2. HAB machine manufacturer's specifications and data sheets or a letter from the HAB machine manufacturer demonstrating that the HAB machine meets minimum jacking force requirements of this specification.
3. Guidance system data sheets.

C. Shop Drawings:

1. HAB cutterhead system to scale with dimensions labeled.
  2. One-way valves assemblies for lubrication port.
- D. Working Drawings:
1. Drawings for trenchless work areas including jacking and receiving pit layout, grading, pavement removal, set-up of all HAB and ancillary equipment, spoils handling, casing pipe staging area, and methods of maintaining and protecting the jobsite and casing pipe.
  2. HAB machine in jacking pit.
  3. Auger system, jacked pipe, and cutter head.
  4. Lubrication piping diagram from mixing tank to point of injection.
- E. Method Statements:
1. Calculations:
    - a. Jacking force calculations that clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information. The sources of information shall be from a widely accepted source and acceptable to Engineer.
    - b. Estimated spoils to be removed by HAB and method for measuring actual spoils removed during construction.
  2. Sample Logs:
    - a. Guidance Record Log.
    - b. Daily Progress Report.
  3. Photos of proposed equipment, including horizontal auger bore machine, augers, and cutter head.
  4. HAB operating plan that includes the following:
    - a. Description of the HAB method.
    - b. List of equipment.
    - c. Method(s) to restrain cutting head from advancing further ahead of the jacked pipe.
    - d. Methods to prevent ground and/or groundwater entering the pits during jacking or receiving.
    - e. Methods to prevent an inadvertent return.
    - f. Provide an operating plan for each of the following possible operating scenarios:
      - 1) Ground is as described in this Section;
      - 2) Ground behavior becomes running;
      - 3) Ground behavior becomes flowing;
      - 4) Ground behavior becomes squeezing;
      - 5) Ground N-value becomes harder than anticipated; and
      - 6) Ground water is encountered.

- g. Each operating plan shall include:
          - 1) Forward thrust
          - 2) Advance rate
          - 3) Adjustment of cutter head in relation to casing leading edge for each operating scenario.
  - 5. Contingency Plans addressing the following:
    - a. Line and/or grade tolerance is exceeded.
    - b. Obstruction removal plan with observational method, documentation, and operational characteristics that indicate an obstruction is encountered.
    - c. Jacking pipe failure plan with inspection, repair, and removal plans. Repair methods shall be acceptable to the pipe manufacturer and the Engineer.
    - d. Excessive ground movement plan including adjustment to operational methods, and means and methods of expeditiously restoring any excessive ground settlement, with special respect to Caltrans right-of-way. Operational changes for construction shall include a discussion of changing operational values, advance rate, and tooling.
    - e. Inadvertent returns mitigation plan with cleanup methods; emergency telephone numbers; sources of equipment and materials needed for containment and clean-up; and corrective actions for reducing operating pressures and modifying lubricant.
    - f. Excavated spoil volume exceeds calculated estimated spoils.
    - g. Noticeable hydrocarbon smell is detected in pit.
    - h. Abandonment of jacked pipe should the drive not be able to be completed.
  - 6. Working schedule including the following activities:
    - a. Work area mobilization for each side.
    - b. Geotechnical Instrumentation installation.
    - c. Geotechnical Instrumentation baseline.
    - d. Jacking pit construction.
    - e. Receiving pit construction.
    - f. HAB installation of casing pipe.
    - g. Contact grouting.
    - h. Installation of carrier pipe into casing pipe.
    - i. Backfilling of annular space between carrier pipe and casing pipe.
    - j. Shaft restoration.
- F. Quality Control Submittals:
- 1. Plan: Identify how the quality of materials and installation will be controlled (e.g. measurements, inspections, testing, etc.).

2. Workforce Qualifications:
  - a. HAB Contractor performing the Work;
  - b. HAB Project Superintendent;
  - c. HAB Operator;
  - d. Contractor's Engineer; and
  - e. Contractor's Surveyor.
3. Certificates: (NOT USED)
4. Record Keeping:
  - a. Guidance Record Log for each shift by 9 am the following work day listing all alignment checks, surveys, and any adjustments, before and after, to line and grade control, person making changes, and time and date of change.
  - b. Provide daily progress reports with the following information for each shift by 9 AM the following work day:
    - 1) Date.
    - 2) Project name.
    - 3) Start and finish times for each crew.
    - 4) Printed name of operator and signature.
    - 5) Number of each jacked pipe segment installed and length of pipe.
    - 6) Start and end time for each jacked pipe segment.
    - 7) Maximum torque for each jacked pipe segment.
    - 8) Lubrication mix and volume placed for each jacked pipe segment.
    - 9) Location of jacked pipe leading edge by station at the start and end of shift.
    - 10) Visual observations of settlement and heave.
    - 11) Volume of spoil material removal relative to the advancement of the casing.
  - c. Obstruction documentation report by 9 AM the following work day.
  - d. Settlement monitoring surveying reports in accordance with Section 02306, Geotechnical Instrumentation and Monitoring.
5. Notifications:
  - a. All notifications are to be provided in writing and within one work day unless otherwise specified herein.
  - b. Within one work day of any proposed addition, deletion, or change to the scheduling of the HAB operation.
  - c. Immediately notify the Engineer upon encountering an object that impedes the forward movement of the casing.
  - d. Immediately notify the Engineer upon implementation of any contingency plan.
6. As-Builts

- a. Guidance Record Log.
- b. Provide as-built survey of the casing pipe prior to installation of carrier pipe. Provide results in both tabular format and AutoCAD format acceptable to the Engineer. Scale to be acceptable to the Engineer. Survey shall confirm that carrier pipe can be installed within design tolerances.

1.07 QUALITY ASSURANCE

- A. Qualifications outlined below shall be met at the time of bid and remain in force through completion of the project:
  - 1. Only workmen experienced in similar tunneling methods as proposed by Contractor shall be used in performing the Work.
  - 2. The Contractor performing the HAB work shall have at least ten (10) years of experience in performing HAB and shall have successfully completed:
    - a. Three (3) HAB projects installing casing pipe between 30 inches and 54 inches OD.
    - b. Three (3) HAB projects using the same type of casing pipe material as specified for this project.
    - c. Three (3) HAB projects in similar ground conditions as measured by soil type, N value and hydrostatic head, as anticipated on this project, with a drive length of at least 100 feet on each project.
  - 3. HAB Project Superintendent shall have:
    - a. A minimum of five (5) years of experience in the installation of pipes using HAB.
    - b. A minimum of five (5) projects, with each project consisting of at least 100 feet of pipe installed using HAB.
    - c. Successfully completed two (2) HAB projects installing casing pipe between 30 inches and 54 inches OD.
    - d. Successfully completed two (2) HAB projects using the same type of casing pipe material as specified for this project.
    - e. Successfully completed two (2) HAB projects in similar ground conditions as measured by soil type, N value, and hydrostatic head, as anticipated on this project.
    - f. Successfully completed one (1) HAB project installing casing pipe under Caltrans right-of-way.
  - 4. Operator shall have:
    - a. A minimum of five (5) years of experience in the installation of pipes using HAB.
    - b. A minimum of ten (10) projects, with each project consisting of at least 100 feet of pipe installed using HAB.
    - c. Successfully completed two (2) HAB projects installing casing pipe between 30 inches and 54 inches OD.

- d. Successfully completed two (2) HAB projects installing the same type of casing pipe material as specified for this project.
  - e. Successfully completed two (2) HAB projects in similar ground conditions as measured by soil type, N-value, and hydrostatic head, as anticipated on this project.
  - f. Successfully completed one (1) HAB project installing casing pipe under Caltrans right-of-way.
  - g. Operated HAB equipment similar to the one proposed on this project.
5. Contractor's engineer shall be a Professional Engineer registered in the State of California. Experience shall include HAB design calculations on five (5) projects within the last five (5) years.
  6. Contractor's Surveyor shall be a Professional Land Surveyor registered in the State of California with experience in underground surveying. Experience shall include:
    - a. Five (5) tunnel projects within the last five (5) years,
    - b. Transfer of points and line from the surface to below ground,
    - c. Closed loop tunnel survey for line and grade.
  7. Experience records shall:
    - a. List the five (5) most recent HAB projects,
    - b. List all HAB projects completed for the Owner,
    - c. List all projects demonstrating the specified experience.
    - d. Provide the following project information: name of project; Owner of the project; names of contacts including all contact information; casing pipe material used; casing pipe nominal diameter; soil or rock types encountered; depth below groundwater table; longest drive completed; and total footage completed.

1.08 DELIVERY, STORAGE AND HANDLING (NOT USED)

1.09 JOB CONDITIONS

- A. The anticipated subsurface conditions are as follows:
  1. Soil types along the HAB path will consist of the following Holocene-age stream terrace deposits: "type a" medium stiff sandy silt and lean clay, and "type b" loose clayey sand, each with few amounts of fine to coarse grained gravel (5% to 10% by weight). Above the groundwater table, soil "type a" will exhibit firm behavior and soil "type b" will exhibit slow raveling behavior according to Tunnelman's Ground Classification.
  2. The groundwater will have seasonal fluctuations of +/- 5 feet in respect to the maximum measured groundwater table shown on the Drawings.
  3. 1 to 5 feet below the invert of the casing the following materials are anticipated: medium stiff sandy lean clay, with few fine gravels (5% to 10% by weight).
  4. Compacted fill, as part of the Highway 101 embankment, will be 1 to 5 feet above the crown of the casing.

5. Tree roots will be encountered below the ground surface at each end of Highway 101 crossing.
  6. For additional geotechnical information refer to the Geotechnical Data Report (GDR).
- B. Refer to Section 4, Changes in Work, for handling of subsurface or latent physical conditions which are materially different from the anticipated subsurface conditions described in the Contract Documents.
- C. Perform all work in accordance with the Cal/OSHA tunnel classification.

#### 1.10 SEQUENCING AND SCHEDULING:

- A. Before starting HAB excavation, Contractor shall:
1. Provide all required submittals of the jacking and receiving pit shoring design as required by Section 02260, Excavation Support and Protection, steel casing pipe as required by Section 02401, Steel Casing Pipe, and this Section.
  2. Complete the construction of jacking and receiving pits in accordance with Section 02260, Excavation Support and Protection.
  3. Install and baseline all required geotechnical instrumentation in accordance with the Drawings and Section 02306, Geotechnical Instrumentation and Monitoring.
- B. Following HAB excavation, Contractor shall:
1. Perform as-built survey of casing pipe.
  2. Perform contact grouting in accordance with Section 02436, Contact Grouting.
  3. Install carrier pipe inside the jacked pipe and perform annular space backfill placement in accordance with Section 02449, Carrier Pipe Installation into Casing.
  4. Restore work areas in accordance with Section 02260, Excavation Support and Protection.

#### 1.11 WARRANTY (NOT USED)

### **PART 2 - PRODUCTS**

#### 2.01 MATERIALS:

- A. General: All materials supplied shall conform to these technical specifications.
- B. Backfill Grout: In accordance with Section 03600, Backfill Grout.
- C. Casing Pipe Joints: In accordance with Section 02401, Steel Casing Pipe.
- D. Contact Grout: In accordance with Section 02436, Contact Grouting.
- E. Carrier Pipe: In accordance with Section 15145, Polyvinyl Chloride (PVC) Pressure Pipe .
- F. Carrier Pipe Supports: In accordance with Section 02449, Carrier Pipe Installation into Casing.
- G. Casing Bulkheads and end seals: In accordance with Section 02449, Carrier Pipe Installation into Casing.

- H. Jacked pipe: shall consist of steel casing pipe in accordance with Section 02401, Steel Casing Pipe.
- I. Lubricants:
  - 1. Bentonite: High yield sodium bentonite; NSF/ANSI Standard 60 compliant.
  - 2. Other admixtures: not permitted.
  - 3. Water: Potable or reclaimed (recycled) water.

## 2.02 EQUIPMENT

- A. All equipment shall have the capacity, stability, and necessary safety features required to fully comply with the Contract Documents without showing evidence of undue stress or failure. It shall be the responsibility of the Contractor to assure that all equipment is in sound operating condition. Backup equipment shall be required in the event of an equipment breakdown and where the condition of the equipment to be used indicates that routine competent replacement or repair will likely be necessary during the work.
- B. Provide an HAB machine with a thrust capacity greater than 2.0 times the anticipated jacking loads.
- C. Provide HAB machine with all ancillary equipment, including auger flights, soil cutting heads, motors, spoil removal equipment, guidance equipment, generators, lighting, spare parts, pipe handling equipment, crane, backhoe, jacking pipe surface supports, and control equipment.
- D. Provide lubricants and associated mixing, conveying and injection equipment.
- E. Provide a common grounding system to the HAB machine to prevent electrical shock in the event of high voltage underground cable strike. The grounding system shall connect all pieces of interconnecting machinery to a common ground. The HAB machine shall be equipped with an “electrical strike” audible and visual warning system that notifies the system operators of an electrical strike.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Perform work in accordance with accepted submittals.
- B. Provide immediate notice of any change to work provided in accepted submittal. Provide written notice within one working day including revised work plan for review by Engineer.
- C. Provide City and Engineer with access to the work.
- D. The installation of pipeline casings under highways shall be in accordance with all the requirements of encroachment permits issued by the governing agency.
- E. Once the jacking operation has commenced, it shall be performed in a timely manner minimizing work stoppages including weekend and holiday stoppages.
- F. Perform all work within designated trenchless work areas.

### 3.02 INSTALLATION:

- A. Organize HAB equipment in such a manner as to enable proper operation at all times, to minimize impacts to property and facility owners.
- B. Provide a suitable containment basins made of plastic lining and sand bags for any equipment operating with fuel, hydraulic, or lubrication oils.
- C. Maintain and keep all equipment in proper working order. All oil, hydraulic, or fuel leaks shall be repaired immediately upon discovery. Any leaking equipment shall not be used until repaired. Any fluid shall be contained and cleaned up upon discovery in accordance with Section 01560, Environmental Controls. Provide written notification within 4 hours of discovery.
- D. Contain all lubricant spills upon discovery and clean up and dispose of spills properly in accordance with Section 01560, Environmental Controls. Provide written notification within 4 hours of discovery.
- E. Provide temporary drainage facilities during construction.
- F. Seal walls of the jacking and receiving pits around the casing pipe in a manner sufficient to prevent loss of ground, lubrication, and contact grout into the pits.
- G. Excavation:
  - 1. Every effort shall be made to avoid any loss of earth outside the jacked casing. In the event of any ground movement over or adjacent to construction in excess of that specified in Section 02306, Geotechnical Instrumentation and Monitoring, all work shall be suspended, except that which will assist in making the construction site secure and prevent any further additional movement of the ground.
  - 2. Lubrication shall be used along the full drive length if the jacking force calculation uses lubrication.
  - 3. Prevent the rear of the cutting head from advancing in front of the leading edge of the casing by more than 1/3 times the casing diameter or 8-inches, whichever is less, when in firm ground conditions as defined by the Tunnelman's Ground Classification.
  - 4. In soil behaviors other than firm, slow raveling, and squeezing as defined by the Tunnelman's Ground Classification, or otherwise behaving in an unstable manner, the cutting head shall be retracted into the casing a distance that permits a balance between pushing pressure, pipe advancement and soil conditions.
  - 5. Log the volume of spoil material removed relative to the advancement of the casing.
  - 6. Provide HAB guidance using survey, water level, or other guidance system to ensure casing is installed within design line and grade.
  - 7. Excavated material shall be removed from the casing as excavation progresses. An accumulation of such material within the jacked pipe that prevents ready access to contact grout/lubrication ports within 8 feet of the face will not be permitted.
  - 8. Excavate all ground using tools provided in accepted submittals.

9. Maintain line and grade during jacking operations. Contractor shall modify the manner in which the jacking operation is being conducted to prevent deviation in excess of specified tolerances. If the alignment of the casing is such that the carrier pipe installation tolerances cannot be met as per Section 02449, Carrier Pipe Installation into Casing, the grade of the casing shall, if required by Engineer, be adjusted. If realignment is not deemed feasible by Engineer, the casing shall be abandoned and another casing meeting the required grade shall be installed. Casing abandonment, realignment or replacement work shall in no way result in extra cost to the City.
- H. Contact Grouting: Perform as indicated in Section 02436, Contact Grouting.
- I. Obstructions: remove all required HAB equipment and perform visual inspection and documentation of the obstruction. Obstruction documentation report shall include: date, location of obstruction, personnel performing the visual inspection, written description of the obstruction material and dimensions and photographs.
- J. Abandonment of casing due to unforeseen subsurface conditions: Casing bores not able to be completed because of unforeseen subsurface conditions, beyond the control of Contractor, shall be abandoned in accordance with this Section.
- K. Fabrication of Carrier Pipe: in accordance with Section 15145, Polyvinyl Chloride (PVC) Pressure Pipe.
- L. Installation of Carrier Pipe: in accordance with Section 02449, Carrier Pipe Installation into Casing.
- M. Carrier Pipe Backfill: in accordance with Section 02449, Carrier Pipe Installation into Casing and Section 03600, Backfill Grout.
- N. Casing abandonment:
  1. Coordinate with Caltrans requirements and their approval of the abandonment work.
  2. Perform contact grouting at all ports in accordance with Section 02436, Contact Grouting.
  3. Plug ends with 12-inch-thick masonry plugs or other materials approved by Engineer.
  4. Fill entire length of installed casing within the plugged ends with cementitious backfill, as specified in Section 03600, Backfill Grout.
  5. Restore area to a condition equal to that prior to construction.

### 3.03 FIELD QUALITY CONTROL

- A. Surveying:
  1. Survey casing during installation. Prepare and pull augers at each third point of the drive to ensure the casing is being installed within the design tolerances.
  2. Perform as-built survey confirming the carrier pipe will be installed per the design and within design tolerances.

3.04 INSPECTION, MAINTENANCE, AND REPAIR (NOT USED)

3.05 INSTRUMENTATION AND MONITORING

A. See Section 02306, Geotechnical Instrumentation and Monitoring.

3.06 SITE RESTORATION

A. In accordance with Section 02260, Excavation Support and Protection.

**END OF SECTION**

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## SECTION 02449

### CARRIER PIPE INSTALLATION INTO CASING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES:

- A. Minimum design and performance requirements for the installation of carrier pipe within casing constructed previously using horizontal auger boring methods.
- B. Furnish all designs, tools, equipment, materials, and supplies and perform all labor required to complete the Work as indicated on the Drawings and specified herein.

##### 1.02 REFERENCED SECTIONS:

- A. Section 01330 – Submittals
- B. Section 02241 – Control of Water
- C. Section 02446 – Horizontal Auger Boring
- D. Section 03600 – Backfill Grout
- E. Section 15145 – Polyvinyl Chloride (PVC) Pressure Pipe
- F. Section 15996 – Testing Pressure Piping

##### 1.03 REFERENCED STANDARDS

- A. General:
  - 1. The following documents form part of the Specifications to the extent stated. Bring conflicts between Specifications, Drawings, and the referenced documents to the attention of the City, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the most stringent shall apply.
  - 2. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual or test designation in effect the date the Notice to Proceed with the Work is given.
- B. ASTM International:
  - 1. ASTM A36 – Standard Specification for Carbon Structural Steel
  - 2. ASTM C33 – Standard Specification for Concrete Aggregate
  - 3. ASTM C150 – Standard Specification for Portland Cement
  - 4. ASTM C618 – Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

##### 1.04 DEFINITIONS

- A. For additional definitions refer to Section 02446, Horizontal Auger Boring.
- B. Backfill Grouting: Injection of cellular grout within the annular space between the carrier pipes and the casing pipe.

- C. Blocking: Dimensional lumber secured to the top of the carrier pipe and used to prevent the carrier pipe from floating within a casing during backfill operations.
- D. Carrier Pipe Support: Pre-manufactured or fabricated means to allow alignment of the carrier pipe within the casing and to prevent the movement of the carrier pipe during backfill grouting. Carrier pipe supports include skids, casing spacers, blocking, etc.
- E. Casing Spacers: Pre-manufactured carrier pipe supports attached to the carrier pipe, advanced with the carrier pipe, and used to set the carrier pipe to design line and grade within a casing. Spacers include legs that support the weight of the carrier pipe and risers that prevent buoyancy. Casing spacers slide along near the casing invert.
- F. Cast Invert: A cementitious mix pour screeded to allow the carrier pipe to be set to design line and grade and to drain and collect incidental water.
- G. Cellular Grout: A lightweight cementitious material that contains stable air or gas cells uniformly distributed throughout the mixture in amounts greater than 20 percent and is suitable for complete backfilling of the void space between carrier pipes and casing pipe.
- H. Centralizer: A centralizing device consisting of multiple flexible support elements that maintain an element in the approximate center of a bored hole. Centralizers are commonly used with geotechnical reinforcement elements.
- I. Pipe carrier system: equipment used to deliver a carrier pipe within a casing pipe.
- J. Rails: Parallel set of guides, similar to railroad tracks, used to set the carrier pipe to design line and grade within a casing. The carrier pipe is slid along the rails which are attached near the casing invert.
- K. Restraint: Pipe joints which are rigidly connected in a manner to prevent longitudinal displacement. Examples of restrained joints include mechanical joint restraints, bell-harness restraints, and butt fused or welded joints.
- L. Runner: The feet of the casing spacer in contact with the bottom of the casing.
- M. Saddle: A pipe support that cradles a pipe and transfers the load of a piping system to a stationary rigid base.
- N. Skid: Dimensional lumber attached parallel to the carrier pipe, advanced with the carrier pipe, and used to set the carrier pipe to design line and grade within a casing. Skids slide along near the casing invert.

#### 1.05 SYSTEM DESCRIPTION

- A. Design Requirements:
  - 1. Carrier pipe shall be installed on carrier pipe supports within casing pipe. The following carrier pipe supports shall be permitted for use: skids, spacers, and cast invert. The use of saddles and centralizers shall not be permitted.
  - 2. Skids, spacers, and blockings, if used, shall be:
    - a. Used in even numbers and with constant spacing such that no support is located directly under the bottom point of the carrier pipe.

- b. Symmetrical design about the vertical axis with an even number of legs, load bearing supports, at or below the carrier pipe spring line, and arms, supports above the spring line that restrict buoyant forces.
  - c. Manufactured of a durable material.
  - d. Assembled onto the carrier pipe before insertion into the casing pipe.
  - e. Slide along surfaces so as to reduce friction and slide over casing pipe weld beads.
3. Cast invert, if used shall be:
- a. Placed in a manner which allows the carrier pipe supports to slide evenly and with minimal friction during installation, all while meeting acceptable carrier pipe damage criteria stated in Section 15145, Polyvinyl Chloride (PVC) Pressure Pipe.
4. Carrier pipe supports shall be designed to:
- a. Withstand the total weight of the carrier pipe plus the weight of water within the filled carrier pipe with a factor of safety of at least 2.0.
  - b. Provide adequate height to position the carrier pipe in the center of casing with a minimum clearance of 3-inches.
  - c. Install the carrier pipe to design line and grade allowing for installation tolerances.
  - d. Withstand dynamic installation loads.
  - e. Designed to prevent dielectric charges flowing between the casing, casing spacer, and carrier pipe.
5. The outer most projection of the carrier pipe shall extend past the inner most projection of the casing pipe by at least twelve (12.0) inches.
6. The annular space between the carrier and casing pipe shall be filled with backfill grout in accordance with this Section.
- B. Performance Requirements:
- 1. Carrier pipe installation tolerances:
    - a. +/- 3-inches horizontal and vertical from the as-built centerline of the casing pipe.
  - 2. No high or low points shall occur along the installed carrier pipe other than as shown on the Contract Documents.
  - 3. Carrier pipe shall be free draining along the pipe invert in the slope direction indicated in the Drawings without depressions that hold water with depth greater than 3/4-inch.

## 1.06 SUBMITTALS

- A. General:
- 1. Submittals shall be made in accordance with Section 01330, Submittals and as specified herein.

2. Submittals shall be coordinated with all relevant submittals, assembled and submitted as a single, comprehensive submittal.
  3. Where calculations are required to be submitted, they shall be signed and sealed by the Contractor's Engineer. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information.
  4. Provide written notifications as specified herein or within one workday.
  5. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.
- B. Product Data:
1. Carrier pipe manufacturer and joint restraint manufacturer's preprinted specifications and operating instructions for proposed pipe carrier system or jacking equipment.
  2. Manufacturer's preprinted specifications and operating instructions for grouting equipment, including pumps, foam generators and ancillary equipment.
  3. Written handling instructions from the carrier pipe manufacturer.
- C. Shop Drawings:
1. Carrier pipe and pipe joint detail.
  2. Details of all carrier pipe supports proposed for use.
  3. Backfill grout injection pipe and return vent locations.
  4. Casing end seals or bulkheads.
- D. Work Drawings:
1. Design profile of carrier pipe placement showing carrier pipe supports.
  2. Drawings for support blocks and bracing to prevent carrier pipe shifting and flotation.
  3. Layout drawing of job site showing all major equipment aboveground and in the pit, include carrier pipe staging areas and pump arrangements.
- E. Method statements:
1. Detailed carrier pipe-laying schedule, include backfill grouting. Schedule shall be coordinated with overall schedule for the Project.
  2. Work plan describing proposed procedures, materials, and equipment to transport or jack carrier pipe into position.
  3. Work plan describing proposed procedures and equipment for placement of cellular grout including the number of lifts, pumping pressure and pumping rate.
  4. Calculations:
    - a. Design calculations for carrier pipe supports. Clearly state their respective spacing assumed in the calculations. Calculations shall demonstrate supports can withstand dynamic installation loads, support the carrier

pipe during backfilling operations, and resist buoyant forces. If carrier pipe support design calculations are signed and sealed by a Professional Engineer who is a staff member of the manufacturer, professional engineering registration in the State of California is not required.

- b. Calculation of estimated total cellular volume, volume of backfill grout for each lift, and not to exceed the maximum allowable lift height.
  - c. Calculation of heat generated by hydration of cellular grout and design calculations for heat control for each grout mix proposed for use. Include carrier pipe manufacturer's written recommendations for the maximum allowable heat of hydration.
  - d. Calculate the maximum anticipated construction loads, buoyancy, backfill grouting pressure and stresses due to the heat of hydration that might be imposed on the carrier pipe, and ensure that anticipated loads are incorporated into the manufacturer's design of the carrier pipe subject to the Engineer's review.
  - e. Maximum allowable grout injection pressure.
5. Description of testing procedures for the cellular grout in accordance with Section 03600, Backfill Grout.
  6. Description of method for monitoring grout mix temperature and pumping pressure.
  7. Description of method for monitoring and controlling the heat of hydration of the cellular grout.
  8. Description of the means and methods of maintaining alignment of the carrier pipe within design tolerances during carrier pipe installation and preventing the movement of the carrier pipe during backfill grouting.
  9. Method of direct communication between the grout injection point and the pump operator during backfill grouting.
  10. Electrical system, lighting system, and onsite power generation details.
  11. Ventilation system details including fan size and operating parameters.
  12. Water sources, handling, and legal disposal.
- F. Quality Control Submittals:
1. Plan: (NOT USED)
  2. Workforce Qualifications:
    - a. Provide Qualifying Experience Record of the Contractor's:
      - 1) Contractor performing the Work;
      - 2) Project superintendent;
  3. Certificates:
    - a. Written confirmation from the carrier pipe manufacturer that the pipe wall and joint configuration to be supplied are appropriate for and consistent with the Contractor's proposed means and methods.

4. Record Keeping:
  - a. Daily installation logs with the following information:
    - 1) Date.
    - 2) Project name.
    - 3) Start and finish times for each shift.
    - 4) Location of pipe by station.
    - 5) Printed name of operator and signature.
    - 6) Number of carrier pipe segments installed.
    - 7) Carrier pipe support ID and location.
    - 8) Any unusual conditions or events.
  - b. Daily grouting logs with the following information:
    - 1) Date.
    - 2) Project name.
    - 3) Start and finish times for each shift.
    - 4) Location of grout injection.
    - 5) Time of grout injection.
    - 6) Volumes of grout placed.
    - 7) Cement content of grout.
    - 8) Stationing of grout placement.
    - 9) Injection pressures.
    - 10) As-cast unit weight results.
    - 11) Designation of cylinder samples prepared during shift.
  - c. Graphical or digital printout records of batch scale readings, accurate to 1.0 pound of the dry mix ingredients before delivery to mixer.
  - d. Provide all logs by 9 AM the following work day.
5. Notifications: (NOT USED)
6. As-Builts:
  - a. As-built of installed carrier pipe in both tabular format and AutoCAD drawing format acceptable to the Engineer. Scale to be acceptable to the Engineer.

#### 1.07 QUALITY ASSURANCE

- A. Qualifications:
  1. General:
    - a. Requirements outlined below shall be met at the time of bid and remain in force through completion of the project. Subcontracted work does not qualify as experience.
    - b. Experience records shall list the five most recent carrier pipe installation projects, including all such projects completed for the City, and all projects demonstrating the specified experience. Each experience record

- shall include name of project; owner of the project; names of contacts including all contact information; carrier pipe material used; carrier pipe diameter; casing pipe internal diameter and longest laying length.
- c. The Engineer will be the sole judge in determining if the prospective contractor, project superintendent, and operator are qualified.
2. The Contractor installing the carrier pipe shall have at least ten years of carrier pipe installation experience and shall have successfully completed:
    - a. Three projects involving installation of carrier pipe inside casing with carrier pipe diameter between 12 inches and 54 inches ID.
    - b. Three projects involving installation of carrier pipe inside casing with the same carrier pipe material as specified for this project.
    - c. At least one project involving installation of carrier pipe inside casing with length longer than the longest length required for this project.
  3. Project Superintendent shall have:
    - a. A minimum of five years of experience in the installation of carrier pipes inside casings.
    - b. A minimum of five projects, with each project consisting of at least 100 feet of carrier pipe installation inside casing.
    - c. Successfully completed two projects involving the installation of carrier pipes inside casings with carrier pipe diameter between 12 inches and 54 inches ID.
    - d. Successfully completed one project involving installation of carrier pipe inside casing with length longer than the longest length required for this project.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Provide Restrained Polyvinyl Chloride (PVC) carrier pipe in accordance with Section 15145, Polyvinyl Chloride (PVC) Pressure Pipe, with nominal diameter as shown on the Drawings.
- B. Provide cellular grout in accordance with Section 03600.
- C. Cast invert concrete:
  1. Portland Cement: ASTM C150, Type I or II.
  2. Fly Ash/Slag
    - a. Fly Ash Admixture: ASTM C618, Class C or F
    - b. Ground Granulated Blast Furnace Slag: ASTM C33, uniformly graded, 0.75 inches in maximum aggregate size.
    - c. Normal Weight Aggregate: ASTM C33, uniformly graded, 0.75 inches in maximum aggregate size.
  3. Water: Potable.

- D. Casing spacers:
  - 1. ASTM A36, minimum.
  - 2. Glass filled polymer runners.
- E. Skids and blocking: Douglas Fir No. 1 grade or better and of rectangular cross section.
- F. Bulkheads and end seals
  - 1. End Seals shall be specifically manufactured for the installation.
  - 2. Bulkheads shall be field-fitted of brick and mortar, minimum of 12-inches-thick.
  - 3. Materials of end seals and bulkheads shall be compatible with the injection of cellular grout and completely close both openings on both ends of the casing.

## 2.02 EQUIPMENT

- A. Provide a means of direct communication between the injection point and the pump operator during backfilling.
- B. Provide chiller pipes within cooling water as required by the Contractor's design to limit the heat of hydration.
- C. Provide pumps and pipes to convey cooling water from the carrier pipe.
- D. Backfill grout placement equipment: In accordance with Section 03600, Backfill Grout.

## **PART 3 - EXECUTION**

### 3.01 GENERAL

- A. Carrier pipe installation and backfill grouting shall be performed in accordance with accepted submittals.

### 3.02 INSTALLATION

- A. Preparation of casing pipe:
  - 1. Provide high side vent pipe in the tunnel crown to allow entrapped air to escape during backfill grouting. Vent pipe shall be mounted at the tunnel crown at the highest location along the casing pipe and it shall extend a minimum of 2.0 feet above the tunnel crown.
  - 2. Provide sampling port located at tunnel invert at the point of backfill grout injection.
  - 3. Carrier pipe installation shall not commence until contact grouting of the annulus of the casing has been completed and casing has been cleaned following contact grouting.
- B. Installation of Carrier Pipe
  - 1. Mount carrier pipe to carrier pipe supports to allow for proper alignment of the carrier pipe within design tolerances and to provide the required clearance between the casing and carrier pipes as specified herein.
  - 2. Carrier pipes installed inside of steel casing pipe shall be supported at a minimum of every 10-feet with a minimum of two carrier pipe supports per pipe, and as

required to comply with all requirements of this Section. Any more stringent requirements from a casing spacer manufacturer or Contractor's Engineer in writing, shall be met, where applicable.

3. Adjust the pipe grade as required by changing the thickness of the supports to compensate for any grade variations of the casing, and to maintain carrier pipelines, grades, and dimensions, as shown on the Drawings.
4. All carrier pipe shall be installed in the casing shall conform to Section 15145, Polyvinyl Chloride (PVC) Pressure Pipe.
5. All carrier pipe installed in a casing must be restrained for the entire length of the casing. Piping shall, at a minimum, be restrained to 1 joint outside of casing. If a fitting is present at the joint, restraint requirements shall conform to details presented in the Contract Documents.
6. Carrier pipe supports shall be installed as to prevent the movement of the carrier pipe during backfilling.
7. Successfully complete final acceptance testing of the installed carrier pipe as specified in Section 15996, Testing Pressure Piping.

C. Backfill Grouting

1. The casing shall be free of standing water and groundwater inflows prior to backfill grouting.
2. Prior to backfilling, pipe string shall have passed an initial pressure and leakage test in accordance with Section 15996, Testing Pressure Piping.
3. The top of the carrier pipe shall be blocked or restrained by carrier pipe supports to prevent flotation during backfilling. All anti-buoyancy measures shall be in place prior to the commencement of backfilling.
4. Construct bulkheads between the carrier and casing pipes at each end of the carrier pipe bundle and at each end of each reach of pipe to be backfilled in the same step to retain grout during backfilling.
5. Ends of the casing pipe shall be sealed with an end seal or bulkhead prior to backfilling.
6. Carrier pipes shall be completely full of water during and following grouting operations until cellular grout is fully cured.
7. Place backfill through injection port at casing invert.
8. Place backfill grout in lifts to minimize flotation and heat generation. The maximum height of each lift of backfill grout shall not exceed the maximum elevation recommended by the carrier pipe manufacturer, measured at the deep end of the pipe.
9. Volume of backfill grout injected shall be measured, recorded, and compared with the anticipated volume per foot of pipe backfilled.
10. Monitor flow rate and temperature gain in cooling water in the carrier pipe during backfill grouting and limit the heat of hydration as to not exceed the maximum

allowable temperature in accordance with carrier pipe manufacturer's recommendations.

11. Monitor as-cast unit weight of cellular grout at the point of placement in accordance with Section 03600, Backfill Grout.
12. Backfill grout placement shall be continued until at least one (1.0) cubic yard of backfill grout overflows from vent pipe to verify complete filling of carrier pipe annulus.
13. Treat and dispose of all water in accordance with the requirements specified in Section 02241, Control of Water.
14. Perform final acceptance testing of the completed pipe string upon completion of backfill grouting in accordance with Section 15996, Testing Pressure Piping.

**END OF SECTION**

**SECTION 02953**  
**PAVEMENT RESTORATION**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. The restoration of asphalt and concrete pavements and surfaces, including roadways, driveways, medians, pavement markings, curbs, gutters, sidewalks, and any other surfaces that may be damaged as a result of the work.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
  - 1. Section 01140 – Work Sequence and Constraints
  - 2. Section 02320 - Trenching

1.03 REFERENCES

- A. References in this Section to the State Standard Specifications means the latest edition of the Standard Specifications published by the State of California, Department of Transportation.
- B. References in this Section to the City of Healdsburg Standard Specifications means the August 4, 2008 Specific Provisions, published by City of Healdsburg, Department of Public Works.
- C. References in this Section to the County of Sonoma Standard Specifications means the March 2020 Trench Backfill and Pavings Details, Pavement Cut Policy, and other details published by the County of Sonoma Department of Transportation and Public Works and adopted on July 9, 2020.

1.04 SUBMITTALS

- A. Submit information for materials to be used in restoring surfaces including mix designs, aggregates, asphalt, pavement fabrics, liquid priming asphalt, surface sealers, roadway striping products, and all other materials to be used for surface restoration.

1.05 DEFINITIONS

- A. Surface Restoration: The repair or replacement of surface materials back to pre-construction condition or better or as indicated due to the work or damaged as a result of the work.

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Provide all materials in accordance with:
  - 1. State Standard Specifications, modified by this Section.
  - 2. City of Healdsburg Standard Specifications, as modified by this Section.
  - 3. County of Sonoma Standard Specifications, as modified by this Section.

- B. Aggregate base and sub-base materials:
  - 1. Class 2, 3/4 –inch maximum, State Standard Specifications, Section 26.
- C. Asphalt concrete pavement materials:
  - 1. State Standard Specifications, Section 39.
  - 2. City of Healdsburg Standard Specifications, Section 6
  - 3. County of Sonoma Standard Specifications
  - 4. PG64-10
- D. Tack coat:
  - 1. State Standard Specifications, Section 94 and Section 92.
  - 2. For work within the City, City of Healdsburg Standard Specifications, Section 6.02
  - 3. For work within the County of Sonoma, S.S. 1 emulsified asphalt, seal all joints with Crafc0 Polyflex Type-1 or equal after paving.
  - 4. Emulsified asphalt Grade SS-1h, unless otherwise indicated
- E. Seal coat:
  - 1. State Standard Specifications, Section 94.
  - 2. City of Healdsburg Standard Specifications, Section 6.02
  - 3. Emulsified asphalt Grade SS-1, unless otherwise indicated
- F. Traffic Stripes and Pavement Markers:
  - 1. State Standard Specifications, Section 84.
  - 2. City of Healdsburg Standard Specifications, Section 7.03
  - 3. Thermoplastic alkyd-type for extrusion application producing an adherent reflectorized stripe capable of resisting deformation by traffic.
- G. Concrete:
  - 1. State Standard Specifications, Section 90
  - 2. Within the City, City of Healdsburg Standard Specifications, Section 9
  - 3. Within the County of Sonoma, concrete shall be replaced in kind and thickness per State Standard Plans P3A+P38, longitudinal joint details.
  - 4. State Standard Specification Class B

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. Reconstruct surfaces to pre-construction condition or better unless otherwise indicated, including curbs, gutters, sidewalks, driveways, medians, pavement, ditches, drainage ways, and related items that have been temporarily removed, damaged, or displaced as part of the work.

- B. Reconstruct pavements in conformance with the City of Healdsburg/County of Sonoma standards as modified herein.
- C. Coordinate the trench surface pavement restoration with the requirements in Section 01140 and as indicated on the Drawings.
- D. Perform trench pavement restoration following the approved hydrostatic test results of the section being tested unless otherwise indicated.
- E. Trench pavement restoration in areas where the pipe is installed with double-welded lap or double gasketed joints may be completed after the joints have been air tested and the trench backfilled prior to pipe hydrostatic test.

### 3.02 SAWCUTTING

- A. Sawcut existing pavement surfaces prior to surface restoration.
- B. Sawcut in straight lines parallel or perpendicular to existing roadway centerlines a minimum of 12 inches outside the edge of trench unless otherwise indicated.
- C. Where sections of existing pavement remain that are less than 2 feet wide between the proposed sawcut and an existing edge of asphalt concrete, curb, or gutter, remove the existing remaining pavement and replace it as part of the pavement restoration.
- D. Where pavement is damaged outside of sawcut lines, re-cut lines and remove damaged pavement.
- E. Where voids develop under existing pavement to remain, re-cut lines, remove pavement and fill voids.

### 3.03 ASPHALT CONCRETE PAVEMENT SURFACE RESTORATION

- A. Place asphalt concrete in accordance with the following as modified herein:
  - 1. State Standard Specification, Section 39.
  - 2. For work within the City, City of Healdsburg Standard Specifications, Section 6
  - 3. For work within the County, County of Sonoma Standard Specifications.
- B. Prepare the road subgrade as specified in Section 02320.
- C. Replace trench pavement to match the removed pavement thickness and aggregate base thickness unless otherwise indicated. Replace trench pavement to the extent indicated on the Drawings.
- D. Test asphalt concrete per:
  - 1. State Standard Specification, Section 39

### 3.04 CONCRETE PAVEMENT SURFACE RESTORATION

- A. Prepare the road subgrade as specified in Section 02320.
- B. Replace trench pavement to match the removed pavement thickness unless otherwise indicated. Replace trench pavement to the extent indicated on the Drawings.
- C. Following sawcutting existing pavement slabs up to 8", insert No. 8 (1" diameter) dowels (Grade 60, epoxy coated carbon steel) into existing concrete on 12-inch centers along the

sides of the trench. Two 12" long dowels are required at every conform of new concrete road to existing concrete road.

- D. Concrete Pavement: Place concrete pavement in accordance with:
  - 1. State Standard Specification, Section 40.
  - 2. For work within the City, City of Healdsburg Standard Specifications, Section 9.
  - 3. For work within the County, County of Sonoma Standard Specifications.
- E. Protect concrete in conformance with Section 90.8 of the State Standard Specifications.
- F.

### 3.05 RESTORATION OF PRIVATE ROADS, PARKING AREAS, AND OTHER PRIVATE IMPROVED AREAS

- A. Reconstruct finished surfaces of private roads, parking areas, and other improved areas with the same materials and to not less than the pre-construction dimensions, unless otherwise indicated.
- B. Reconstruct improvements damaged as part of the work to pre-construction condition or better.
- C. Asphalt Pavement: Match existing pavement thickness, or at least 3 inches of asphalt concrete, whichever is greater.
- D. Gravel, stone, or aggregate surfaces: Match existing thickness, or at least 6 inches, whichever is greater.

### 3.06 RESTORATION OF CONCRETE SURFACES

- A. Reconstruct concrete surfaces including curbs, gutter, sidewalks, wheelchair ramps, medians, valley gutters and any other concrete surface or structure temporarily removed, damaged, or displaced as part of the work in accordance with:
  - 1. Standard State Specification, Section 73
  - 2. For work within the City, City of Healdsburg Standard Specifications, Section 9.
  - 3. For work within the County, County of Sonoma Standard Specifications.

### 3.07 SEALCCOAT

- A. Fog sealing shall be performed at no cost to the Engineer in all cases for aesthetic purposes where the final pavement lift has, in the opinion of the Engineer, been excessively damaged and patched by the Contractor. Provide a seal coat over new pavement in accordance with:
  - 1. State Standard Specification, Section 37.
  - 2. For work within the City, City of Healdsburg Standard Specifications, Section 6.02
  - 3. For work within the County, County of Sonoma Standard Specifications.

### 3.08 TRAFFIC STRIPES AND PAVEMENT MARKINGS

- A. Replace traffic stripes and pavement markings in conformance with the following as modified below:
  - 1. State Standard Specification, Sections 84.

2. City of Healdsburg Standard Specifications, Section 7.03.
  3. For work within the County, County of Sonoma Department of Transportation and Public Works Signing, Striping and Marking Notes dated July 2018., revised June 2020.
- B. Restore traffic stripes and pavement markings in accordance with the following schedule.
1. Place cat tracking for the remaining striping the day following installation of the surface course.
  2. Place traffic striping and markings not more than one day following approval of the cat tracking by the roadway jurisdiction.
  3. Place pavement markings not more than 2 weeks following installation of the pavement.
- C. Application:
1. Apply thermoplastic material by extrusion method in a single, uniform layer.
  2. Use stencils in new condition without bends or damage when applying pavement markings.
  3. Completely coat the pavement surface and fill all surface voids with the marking material.
  4. Apply glass beads promptly to the molten thermoplastic material.
  5. Rates of application
    - a. Stripes: 0.075-inch thick,  $\pm$  0.005 inch.
    - b. Pavement markings: 0.125-inch thick,  $\pm$  0.005 inch
    - c. Glass beads: 8 pounds per 100 square feet.
- 3.09 PAVEMENT MARKERS
- A. Restore pavement markers in accordance with:
1. State Standard Specification, Section 85
  2. City of Healdsburg Standard Specifications, Section 7.03
- 3.10 RAISING MANHOLE, VALVE, AND OTHER UTILITY COVERS
- A. Place temporary steel covers over manhole and valve boxes prior to placing permanent pavement.
- B. Following pavement installation, remove the temporary covers and install grade rings as necessary to adjust the surface of the frames and covers to conform to the surface of the surrounding pavement surface.
- C. Following adjustment of the frames and covers, neatly chip with a flat tool or sawcut the pavement around each frame to provide a smooth, even, vertical surface.
- D. Install asphalt concrete in accordance with this Section, to provide a smooth surface around each frame, so that the frame, cover and pavement surfaces match.

**END OF SECTION**

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**SECTION 03301**  
**CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Requirements for cast-in-place concrete work.

1.02 REFERENCED SECTIONS

- A. None

1.03 REFERENCES

- A. NSF International (NSF) and American National Standards Institute (ANSI)
  - 1. NSF/ANSI Standard 61 Drinking Water System Components – Health Effects

1.04 SUBMITTALS

- A. Shop Drawings
  - 1. Reinforcing Steel: Prepare shop fabrication and field installation drawings in accordance with CRSI Manual of Standard Practice and ACI SP.
  - 2. Layout drawings for construction joints.
- B. Product Data: Waterstops, curing, form release agent compound data.
- C. Concrete Mix Design: Data on the concrete mix, including aggregate gradations and admixtures, in accordance with ASTM C94.
- D. Quality Control Submittals
  - 1. Manufacturer’s application instructions for curing compound.
  - 2. Ready-mix delivery tickets for each truck in accordance with ASTM C94.
- E. NSF/ANSI Standard 61 Certification: Submit the complete mix design and certification of each component of Concrete, form-release agent, and curing compound for review and potentially certify by review, or if required by qualified certification agency, submit test cylinders of concrete for testing and certification by NSF, Underwriters Laboratory (UL), or an equal that can test and certify concrete batches in accordance with NSF/ANSI Standard 61. Submit certification results to the Engineer.

1.05 QUALITY ASSURANCE

- A. Supplier Qualifications: A minimum of 5 years’ experience manufacturing ready-mixed concrete and that complies with ASTM C94 for production facilities and equipment.
- B. Source Limitations: Use the same brand of cement from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- C. Concrete and Reinforcement: Unless otherwise specified, meet the requirements of ACI 301 and 318.
- D. Hot Weather Concreting: Conform to ACI 305R.

## **PART 2 - PRODUCTS**

### **2.01 FORMWORK**

- A. Exposed Areas: Use hard plastic or finished plywood.
- B. Unexposed Areas: Use new ship lap or plywood.
- C. Earth cuts may be used for forming footings.

### **2.02 CONCRETE**

- A. Ready-mixed meeting ASTM C94, Option A.
- B. Portland Cement: ASTM C150, Type II.
- C. Aggregates: Furnish from one source.
  - 1. Natural Aggregates
    - a. Free from deleterious coatings and substances in accordance with ASTM C33, except as modified herein.
    - b. Free of materials and aggregate types causing pop outs, discoloration, staining, or other defects on surface of concrete.
  - 2. Non-Potentially Reactive: In accordance with ASTM C33, Appendix XI, paragraph X1.1.
  - 3. Aggregate Soundness: Test for fine and coarse aggregates in accordance with ASTM\_C33 and ASTM\_C88 using sodium sulfate solution.
  - 4. Fine Aggregates
    - a. Clean, sharp, natural sand.
    - b. ASTM C33.
    - c. Materials Passing 200 Sieve: 4 percent maximum.
    - d. Limit deleterious substances in accordance with ASTM C33, Table 1 with material finer than 200 sieve limited to 3 percent, coal and lignite limited to 0.5 percent.
  - 5. Coarse Aggregate
    - a. Natural gravels, combination of gravels and crushed gravels, crushed stone, or combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension).
    - b. Materials Passing 200 Sieve: 0.5 percent maximum.
- D. Admixtures: Do not use admixtures that contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Air-Entraining: ASTM C260.
  - 2. Water-Reducing: ASTM C494, Type A or D.
  - 3. Superplasticizers: ASTM C494, Type F or G.
  - 4. Fly Ash: ASTM C618, Class C or F.

5. Color Pigments: Inert mineral or metal oxide pigments, natural or synthetic; resistant to lime and other alkalies.

E. Concrete Mix Design

1. Minimum Compressive Field Strength: 4,000 psi at 28 days when cured and tested in accordance with ASTM C31 and C39.
2. Coarse Aggregate Size: 1-1/2 inches and smaller.
3. Slump Range: 3 to 5 inches.
4. Air Entrainment: Between 3 and 6 percent by volume.
5. Water Reducers: Use in concrete without plasticizers.

F. Proportions

1. Design mix to meet aesthetic and structural concrete requirements.
2. Water-cement ratio (water-cement plus fly ash ratio) shall control amount of total water added to concrete as follows:

Coarse Aggregate Size	W/C Ratio
1-1/2 inch	0.50
1 inch	0.45

3. Minimum Cement Content (Combined Cement Plus Fly Ash Content):
  - a. 517 pounds per cubic yard for concrete with 1-1/2 inch maximum size aggregate.
  - b. 540 pounds per cubic yard for 1 inch maximum size aggregate.
4. Increase cement content (combined cement plus fly ash content), as required meeting strength requirements and water-cement ratio.
5. Fly Ash Content: minimum 20 percent, maximum 50 percent by weight of total cement content.

- G. Mixing: Minimum 70 and maximum 270 revolutions of mixing drum. Non-agitating equipment is not allowed.

2.03 REINFORCING STEEL

- A. Deformed Bars: ASTM A615, Grade 60.
- B. Welded Wire Reinforcement: ASTM A185, fabricated from as-drawn steel wire into flat sheets.
- C. Bar Supports:
  1. For Slab Rebar: Concrete blocks or plastic bar supports.
  2. For Rebar in Walls, Beams, Columns, and Slabs Exposed to View: Galvanized steel chairs with plastic tips or plastic bar supports and side form spacers.

## 2.04 ANCILLARY MATERIALS

- A. Epoxy Bonding Agent and Adhesives (for Binding New Concrete to Existing Concrete)
  - 1. Epoxies: Two component material for use on dry or damp surfaces and conforming to the requirements of ASTM C881.
  - 2. Apply in accordance with manufacturer's recommendations.
  - 3. Epoxy Bonding Agent for water-containing structures at potable water treatment or storage tanks shall have NSF/ANSI Standard 61 certification for contact with water for the water-containing structure's area/volume ratio.
  - 4. Manufacturers: One of the following or equal:
    - a. Sika Armatec 110 EPOCEM; Sika Chemical Corporation.
    - b. CCS Bonder Paste LWL; Chemco Systems.
- B. Vapor Barrier
  - 1. Material: 15 mil, multilayer plastic, 0.01 minimum permeance rating.
  - 2. Manufacturers: One of the following or equal:
    - a. StegoWrap, Stego Industries.
    - b. Premoulded Membrane Vapor Seal with Plasmatic Corel, W. R. Meadows.
- C. Form-Release Agent
  - 1. Water-based, high solids content non-yellowing curing compound meeting requirements of ASTM C309 and C1315.
  - 2. Moisture Loss: 0.40 kg/square m/72 hours maximum.
  - 3. Capable of meeting moisture retention at manufacturer's specified application rate.
  - 4. Manufacturers and Products:
    - a. Atlas; Bio-Guard.
    - b. Dayton Superior; Clear Strip J1EF.

## PART 3 - EXECUTION

### 3.01 FORMWORK

- A. Design, construct, erect, brace and maintain formwork in accordance with ACI 301.
- B. Form Ties
  - 1. Fixed conical or spherical type inserts that remain in contact with forming material and allow for dry packing of form tie holes.
  - 2. Space ties to withstand pressures and to limit deflection of forms to acceptable limits.
  - 3. Wire ties are not acceptable.
- C. Construction
  - 1. In accordance with ACI 347.

2. Make joints tight to prevent escape of mortar and to avoid formation of fins.
  3. Brace as required to prevent distortion during concrete placement.
  4. On exposed surfaces locate form ties in uniform pattern or as shown.
  5. Construct so ties remain embedded in the wall with no metal within 1-inch of concrete surface when forms, inserts, and tie ends are removed.
- D. Form Removal
1. Remove after concrete has attained 28 day strength, or approval is obtained in writing from Engineer.
  2. Remove forms with care to prevent scarring and damaging the surface.

### 3.02 PLACING REINFORCING STEEL

- A. Place reinforcing steel in accordance with CRSI Recommended Practice for Placing Reinforcing Bars.
- B. Field bending or welding of reinforcing bars will not be allowed.
- C. Bar Supports: Provide in sufficient quantity to prevent sagging and to support bars during concrete placement.
- D. Splices and Laps
  1. Top Bars: Horizontal bars placed such that 12 inches of fresh concrete is cast below in single placement.
  2. Horizontal wall bars are considered top bars.
  3. Bar lap splices shall conform to General Structural Notes on the Drawings.
  4. Tie splices with 18-gauge annealed wire as specified in CRSI Standard.

### 3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301.
- B. Before placing concrete:
  1. Check reinforcing steel for proper placement and correct discrepancies.
  2. Remove excessive rust, mill scale, dirt, oil and other material from rebar that may adversely affect bonding to concrete.
  3. Remove water from excavation and debris and foreign material from forms.
- C. Before depositing new concrete on existing concrete, clean surface using sandblast or other mechanical means to obtain a 1/4 inch rough profile, and apply epoxy bonding agent in accordance with the manufacturer's instructions.
- D. Place concrete as soon as possible after leaving mixer, without segregation or loss of ingredients, without splashing forms or steel above, and in layers not over 2 feet deep. Place within 1-1/2 hours after adding cement to mix.
- E. Placement Limitations: 8 feet maximum vertical drop to final placement, when not guided with chutes or other devices to prevent segregation due to impact with reinforcing.

F. Hot Weather

1. Prepare ingredients, mix, place, cure, and protect in accordance with ACI 305R.
2. Maintain concrete temperature below 80 degrees F at time of placement, or furnish test data or provide other proof that admixtures and mix ingredients do not produce flash set plastic shrinkage, or cracking due to heat of hydration. Ingredients may be cooled before mixing to maintain fresh concrete temperatures at 80 degrees F or less.
3. Make provisions for windbreaks, shading, fog spraying, sprinkling, ice, or wet cover, or other means to provide concrete with temperature specified.
4. Maximum allowable temperature differential between reinforcing steel and concrete: Not greater than 20 degrees F at the time of concrete placement.

3.04 COMPACTION

A. Vibrate concrete as follows:

1. Apply approved vibrator at points spaced not farther apart than vibrator's effective radius.
2. Apply close enough to forms to vibrate surface effectively but not damage form surfaces.
3. Vibrate until concrete becomes uniformly plastic.
4. Vibrator must penetrate fresh placed concrete and into previous layer of fresh concrete below.

3.05 CONSTRUCTION JOINTS

A. Locate as shown or as approved.

B. Maximum Spacing Between Construction Joints: 40 feet, unless otherwise indicated.

3.06 CRACK CONTROL JOINTS

A. Provide crack control joints in concrete slabs on grade, curbs, gutters, sidewalks and other concrete flatwork as follows:

1. Install crack control joints by use of grooving tool on fresh concrete or saw-cut by use of a saw designed for crack control joints as soon as the concrete hardens sufficiently to support the saw, however, no longer than 12 hours after concrete placement.
2. Depth: 1/4 the thickness of the slab.
3. Frequency: Unless otherwise indicated,
  - a. At least 2 times the slab thickness in feet (6-inch slab = 12 foot on center).
  - b. Rectangular slabs: Maximum spacing 1-1/2 to 1

3.07 FINISHING FLOORS AND SLABS

A. Unexposed Slabs: Screed to true surface, bull float with wood float, and wood trowel to seal surface and to provide a uniform surface.

- B. Exposed Slabs to Receive Grout: Screed to indicated elevation and leave without special finish.
- C. Exposed Floors and Slabs: Screed to true surface and use bull float to form a uniform surface with minor texture then apply final surface finish.
- D. Final Surface Finishes for Exposed Floors and Slabs:
  - 1. Walkway finish: Apply to concrete surfaces that will be used for foot traffic such as walkways around basins and sidewalks. Apply steel trowel surface, then a light hairbroom finish to produce a profile that is parallel to the slab drainage.
- E. Tolerances: Exposed surfaces shall not vary from level or true plane more than 1/4 inch in 10 feet when measured with a straightedge.

### 3.08 FINISHING AND PATCHING FORMED SURFACES

- A. Unexposed Surfaces: Provide rough-formed concrete texture as imparted by form-facing material, fill form tie holes with nonshrink grout and grind off projections, fins, and rough spots.
- B. Exposed Surfaces: Provide smooth-formed concrete texture as imparted by form-facing material, arranged in an orderly and systematic manner with a minimum number of seams. Fill form tie holes with nonshrink grout and grind off projections, fins, and rough spots. Where scheduled, apply rubbed surface as follows:
  - 1. Smooth Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive to produce a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- C. Patching Defective Areas: Patch defective areas and repair rough spots resulting from form release agent failure or other reasons to provide smooth uniform appearance.
  - 1. Cut out honeycombed and defective areas.
  - 2. Cut edges perpendicular to surface at least 1-inch deep. Do not feather edges. Soak area with water for 24 hours.
  - 3. Finish surfaces to match adjacent concrete.
  - 4. Keep patches damp for minimum 7 days or spray with curing compound to minimize shrinking.

### 3.09 PROTECTION AND CURING

- A. Protect fresh concrete from direct rays of sunlight, drying winds, and wash by rain.
- B. Keep concrete slabs continuously wet for a 7 day period. Intermittent wetting is not acceptable.
- C. Use curing compound only where approved by Engineer. Cure formed surfaces with curing compound applied in accordance with manufacturer's directions as soon as forms are removed and finishing is complete.
  - 1. Do not use curing compound on concrete surfaces that will be painted.
- D. Remove and replace concrete damaged by freezing.

### 3.10 FIELD QUALITY CONTROL

- A. Concrete Samples:
  - 1. Provide concrete for making composite samples for testing slump, air content, and for making cylinders for determination of compressive strength.
  - 2. Prepare samples in accordance with ASTM C172. Select trucks or batches of concrete on a random basis.
  - 3. Samples may be obtained at the discharge chute of the truck or at the point of discharge into forms.
- B. Sampling Frequency: One composite sample for each 100 cubic yards of structural concrete, or fraction thereof, of each concrete mixture placed in any one day.
- C. Evaluation will be in accordance with ACI 301, Chapter 17 and Specifications.
- D. Slump tests and concrete cylinders will be made by the Owner. Owner will handle cured test cylinders, transport to the testing laboratory and pay testing costs.
- E. Enforcement of Compressive Strength Requirements:
  - 1. Compressive strength of concrete will be considered acceptable if the following conditions are satisfied:
    - a. Averages of all sets of 3 consecutive strength test results are greater or equal to the specified compressive strength.
    - b. No individual strength test (average of 2 cylinders) falls below specified compressive strength by more than 500 pounds per square inch.
  - 2. Whenever one, or both, of 2 conditions stated above is not satisfied, provide additional curing of affected portion of structure, then obtain test cores from the affected area.
    - a. Obtain 3 test cores in accordance with ASTM C42 and ACI 318.
    - b. Concrete will be considered acceptable if the average compressive strength of the 3 test cores is equal to at least 90 percent of the specified 28-day compressive strength and no single core is less than 80 percent of the specified 28-day compressive strength.
    - c. Concrete will be designated as defective when the specified conditions are not achieved.
    - d. Fill core holes with concrete.
  - 3. Engineer may require the Contractor to strengthen defective concrete by means of additional concrete, additional reinforcing steel, or replacement of defective concrete, all of the Contractor's expense.

**END OF SECTION**

**SECTION 03600**  
**BACKFILL GROUT**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES:

- A. Minimum requirements for the backfill grout used to backfill the annular space between a carrier pipe and a casing installed by trenchless methods.
- B. Furnish all designs, tools, equipment, materials, and supplies and perform all labor required to complete the Work as indicated on the Drawings and specified herein.

1.02 REFERENCED SECTIONS:

- A. Section 01330 – Submittals
- B. Section 02449 – Carrier Pipe Installation into Casing

1.03 REFERENCED STANDARDS

- A. General:
  - 1. The following documents form part of the Specifications to the extent stated. Bring conflicts between Specifications, Drawings, and the referenced documents to the attention of the City, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the most stringent shall apply.
  - 2. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual or test designation in effect the date the Notice to Proceed with the Work is given.
- B. American Concrete Institute (ACI):
  - 1. ACI 523.1R – Guide for Cast-in-Place Low-Density Cellular Concrete
  - 2. ACI 523.3R – Guide for Cellular Concretes above 50 lb/ft<sup>3</sup>.
- C. ASTM International:
  - 1. ASTM C150 – Specifications for Portland Cement
  - 2. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete
  - 3. ASTM C495 – Standard Test Method for Compressive Strength of Lightweight Insulating Concrete
  - 4. ASTM C567 – Standard Test Method for Unit Weight of Structural Lightweight Concrete
  - 5. ASTM C796 – Standard Method of Testing Foaming Agents for Use in Producing Cellular Concrete Using Preformed Foam
  - 6. ASTM C869 – Standard Specification for Foaming Agents Used in Making Preformed Foam for Cellular Concrete

#### 1.04 DEFINITIONS (NOT USED)

#### 1.05 SYSTEM DESCRIPTION

##### A. Design Requirements:

1. Backfill grout shall be a cellular grout mix designed in accordance with the requirements of ACI 523.1R, ACI 523.3R, and as specified herein. In the event of conflict between the requirements of the listed documents and those specified herein, the requirements of this Section shall prevail.
2. Mixes shall be adjusted in the field as necessary to meet the requirements of these specifications.
3. Maximum allowable injection pressure shall use a factor of safety not less than the greater of 2.0 or that recommended by the carrier pipe manufacturer.

##### B. Performance Requirements:

1. 7- and 28-day compressive strength range per ASTM C 495 of the cellular grout shall be:
  - a. 7 days: 300 psi minimum,
  - b. 28 days: 500 psi minimum,
  - c. 56 days: 450 psi minimum, as acceptance criteria only.
2. Dry density shall be between 50 and 55 pounds per cubic foot (pcf), unless a higher density is required to achieve strength requirements.
3. Preformed foam shall be generated by combining controlled quantities of air, water, and foaming agent under pressure. Foam shall retain its stability until the cement sets to form a self-supporting matrix. The concentration of foam agent shall be in accordance with the foaming agent material manufacturer's recommendations.

#### 1.06 SUBMITTALS

##### A. General:

1. Submittals shall be made in accordance with Section 01330, Submittals, and as specified herein.
2. Submittals shall be coordinated with all relevant submittals, assembled and submitted as a single, comprehensive submittal.
3. Where calculations are required to be submitted, they shall be signed and sealed by the Contractor's Engineer. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information.
4. Provide written notifications as specified herein or within one workday.
5. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

- B. Product Data:
  - 1. Mix designs for each cellular grout mix proposed for use. Each mix design shall include the following:
    - a. Type, brand, source, and amounts of cement, pozzolans, admixtures, and other additives.
    - b. Amount of water.
    - c. Combined grading of aggregates.
    - d. Specific gravity of all materials.
    - e. Compressive strength test results.
  - 2. Provide material specifications and manufacturer's mixing instructions for each design mix ingredient.
  - 3. Provide sample testing results of each proposed mix design, including the following:
    - a. Three (3) sets of compression test cylinders (3.0 inches by 6.0 inches), three (3) cylinders per set. One set of three (3) cylinders shall be tested at an age of 7 days, another other set shall be tested at an age of 28 days, and the last set shall be tested at an age of 56 days.
    - b. Total air content in accordance with ASTM C 796.
    - c. Unit weight in accordance with ASTM C 567.
- C. Shop Drawings: (NOT USED)
- D. Work Drawings: (NOT USED)
- E. Method Statements: (NOT USED)
- F. Quality Control Submittals:
  - 1. Workforce Qualifications:
    - a. Provide Qualifying Experience Record of the Contractor's:
      - 1) California Professional Engineer
      - 2) Cellular Grout Mix Specialist
  - 2. Certificates: (NOT USED)
  - 3. Record Keeping:
    - a. Provide field testing results as specified herein.
    - b. Submit daily grouting logs in accordance with Section 02449, Carrier Pipe Installation into Casing.
  - 4. Notifications: (NOT USED)
  - 5. As-Builts: (NOT USED)

## 1.07 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Foaming agent manufacturer shall have at least five (5) years of experience manufacturing for similar types of installations.

2. Sample testing shall be performed by a certified laboratory.
- B. Preconstruction Meeting: (NOT USED)

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Portland Cement:
1. Shall conform with ASTM C150, Type II or V.
- B. Potable water:
1. Shall be free from deleterious amounts of alkali, acid, and organic materials which would adversely affect the setting time or strength of the cellular grout.
  2. Provide water with a pH not less than 6.7.
- C. Concrete Admixtures:
1. Shall not contain chlorides that promote corrosion.
  2. Retarder/Water Reducer: Conforming to ASTM C494, Type D.
  3. Plasticizer/Water Reducer: Conforming to ASTM C494, Type A.
  4. Admixtures shall only be used with foaming agent when specifically approved in writing by foam agent manufacturer.
- D. Foaming Agent:
1. Shall comply with ASTM C869 when tested in accordance with ASTM C796.

### **2.02 EQUIPMENT:**

- A. Provide equipment capable of satisfactorily mixing, agitating, and forcing backfill grout into injection ports at a uniform flow rate under the required constant pressure.
- B. Backfill grout batching, mixing, and pumping equipment shall be compatible and of sufficient size and capacity to place backfill grout to distances and volumes proposed.
- C. Configure backfill grouting equipment so that flushing can be accomplished with grout intake valves closed, with water supply valve open, and with grout pump running at full speed.
- D. Provide a timer-controlled foam generator to repetitively discharge a preselected quantity or to discharge continuously at a fixed rate. Foam generating equipment shall be tested and calibrated for dilution percentage, density, and volume output.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Perform work in accordance to accepted submittals.
- B. Backfill grout shall be mechanically mixed to produce a uniform distribution of materials.
- C. Follow the manufacturer's recommendations concerning the order of charging the mixer with the various ingredients.

- D. The admixture content, batching method, and time of introduction to the mix shall be in accordance with the manufacturer's written recommendations for minimum shrinkage and for compliance with these specifications.
- E. Compare field test results to submitted test results and modify mix design as necessary to meet requirements specified herein.
- F. Obtain field measurements as specified herein.

### 3.02 INSTALLATION

- A. Place backfill grout in accordance with Section 02449, Carrier Pipe Installation into Casing.
- B. Prepare daily grouting logs in accordance with Section 02449, Carrier Pipe Installation into Casing.

### 3.03 FIELD QUALITY CONTROL

- A. Each set of compression test cylinders shall be marked or tagged with the date and time the samples were made, stationing of placement, batch number, and the unit weight (wet density) measured at the point of placement, unless otherwise specified herein.
- B. Specimens shall be collected at the point of injection, unless otherwise specified herein.
- C. Each proposed mix shall be tested in accordance with ASTM C796.
- D. Test specimens shall be made, cured, stored, and tested in conformity with ASTM C495.
- E. Sample testing of each specimen collected on the field shall include:
  - 1. Provide one (1) set of four (4) test samples for each shift when backfill grout is placed. One additional set of four test samples shall be made from each additional 200 cubic yards, or major fraction thereof, placed in any one shift. Two (2) samples from each set shall be tested at an age of 28 days. The other two (2) samples shall be tested at an age of 56 days.
  - 2. Provide one (1) set of four (4) test samples from the overflow after excess water and approximately one (1) cubic yard of cellular grout has been wasted. Testing shall be the same as above.
  - 3. Measure as-cast unit weight (wet density) at point of injection.
  - 4. Measure as-cast unit weight (wet density) at point of overflow after excess water and approximately one (1) cubic yard of cellular grout has been wasted.
- F. Compressive strength of cellular grout shall be considered satisfactory if conditions 1 and 2 are both met or condition 3 is met:
  - 1. Average of all 28-day compressive strength tests within a single reach equal or exceed the specified unconfined compressive strength of 500 psi.
  - 2. No individual 28-day unconfined compressive strength test is less than 400 psi.
  - 3. All 56-day unconfined compressive strengths within a single reach average greater than 450 psi.
- G. The foaming agent manufacturer's field services representative shall approve all changes to the proposed mix designs in the field.

**END OF SECTION**

**SECTION 05501**  
**ANCHOR BOLTS AND ANCHORING DEVICES**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Anchor bolts, concrete anchors, adhesive anchors, and other anchoring devices.

1.02 REFERENCED SECTIONS

- A. None

1.03 SUBMITTALS

- A. Product Data: Manufacturer's data for nuts, bolts, concrete anchors, chemical anchors and other fasteners.
- B. Catalog data and ICC reports for each type of anchor bolt.

1.04 QUALITY ASSURANCE

- A. For applications that require special inspection in accordance with building codes, coordinate the progress of the Work with the required inspection activities.

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Unless otherwise specified or indicated on the Drawings, materials of construction for anchoring devices shall conform to the following:
  - 1. Anchor bolts and other anchoring devices, nuts and washers installed indoors: Type 304 stainless steel.
  - 2. Anchor bolts and other anchoring devices, nuts and washers installed outdoors or in locations exposed to wastewater: Type 316 stainless steel.
    - a. Locations exposed to wastewater includes:
      - 1) Below tops of walls of water-containing structures.
      - 2) Underside of roof, slab or walkways of enclosed water-containing structures.
      - 3) Dry side of walls on water-containing structures.

2.02 CAST-IN-PLACE ANCHOR BOLTS

- A. Locations for use of cast-in-place anchor bolts:
  - 1. In locations indicated on the Drawings.
  - 2. To anchor engine-driven equipment and equipment with motors 3 horsepower and larger.
- B. Cast-in-Place Anchor Bolts
  - 1. Material: Stainless steel conforming to ASTM A320.

2. Minimum Length of Bolt: As indicated on the Drawings. When not indicated, provide bolt length such that the length of the embedded anchor is at least 10 bolt diameters.
3. Minimum length of 90-degree hook: 4 bolt diameters.

### 2.03 CONCRETE ANCHORS

- A. Concrete Anchors: Drilled in place wedge-type anchors with threaded stud body, stainless steel expansion clip, nut and washer.
- B. Materials: Type 304 or Type 316 stainless steel, depending upon installed location.
- C. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC193.
- D. Manufacturers: One of the following or equal:
  1. Hilti Kwik Bolt 3.
  2. ITW Redhead, Trubolt Wedge Anchor.
  3. Dewalt Fasteners, Power-Stud SD4 or SD6.
  4. Simpson Strong Tie, Strong-Bolt 2 Wedge Anchors.

### 2.04 STUDS

- A. Material: Conforming to ASTM A108 with 50,000 pounds per square inch minimum yield strength, and 60,000 pounds per square inch minimum tensile strength.
- B. Manufacturers: One of the following or equal:
  1. Nelson Stud Welding Company, S3L Shear Connectors or H4L Concrete Anchors.
  2. Stud Welding Products, Headed Concrete Anchors and Shear Connectors or Concrete Anchors.

### 2.05 ADHESIVE ANCHORS

- A. Applications: Use for bonding threaded rods and concrete reinforcing bars to hardened concrete and grouted cement masonry. Do not use in overhead applications, in chlorine gas environments, or where anchor may be exposed to machine oil or diesel oil.
- B. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC58.
- C. Materials
  1. Epoxy Adhesive: Two component, injectable epoxy adhesive.
  2. Concrete Reinforcing Bars: Grade 60.
  3. Threaded Rods: Type 304 stainless steel all-thread rod conforming to ASTM F593.
- D. Manufacturers: One of the following or equal:
  1. Hilti HVA Adhesive Anchor System.
  2. ITW Redhead G6+ Adhesive Anchoring System.
  3. Dewalt Fasteners PE1000+ Epoxy Anchoring System.

4. Simpson Strong Tie, SET-XP Epoxy Adhesive.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL ANCHORING REQUIREMENTS**

- A. Use equipment shop drawings, anchorage layout drawings, and anchor bolt layout templates to accurately position anchor bolts.
- B. Install anchor bolts, concrete anchors and other anchoring devices with at least 2 threads projecting beyond the nut, but no more than 1/2-inch projecting beyond the nut.
- C. Prior to installing nuts, coat threads of stainless steel bolts with material to prevent galling of threads.
  1. Manufacturers: One of the following or equal:
    - a. Never Seez Compound Corporation, Never-Seez.
    - b. Oil Research, Inc., WLR No. 111.
- D. Tighten nuts on anchor bolts, concrete anchors and other anchoring devices to the "snug-tight" condition, defined as tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary wrench.

#### **3.02 CAST-IN-PLACE ANCHOR BOLTS**

- A. Do not use expansion type concrete anchors or adhesive anchors as substitution for cast-in-place anchor bolts.
- B. Accurately place anchor bolts to be embedded in concrete within the formwork and perpendicular to surface from which they will project. Secure in correct position while concrete is placed.
- C. Do not allow anchor bolts to touch reinforcing steel. Where anchor bolts are within 1/4 inch of reinforcing steel, isolate with a minimum of 4 wraps of 10 mil polyvinyl chloride tape in area adjacent to reinforcing steel.
- D. In anchoring machinery bases subject to heavy vibration, use 2 nuts, with 1 serving as a locknut.
- E. Where bolts are indicated on the Drawings for future use, first coat thoroughly with non-oxidizing wax, then turn nuts down full depth of thread and neatly wrap exposed thread with waterproof polyvinyl tape.
- F. Where indicated on the Drawings, set anchor bolts in metal sleeves having inside diameter approximately 2 inches greater than the bolt diameter and a minimum of 10 bolt diameters deep. Fill sleeves with grout when equipment is grouted in place.

#### **3.03 CONCRETE ANCHORS AND ADHESIVE ANCHORS**

- A. Cast-in-place anchor bolts may be used in place of concrete anchors and adhesive anchors at Contractor's option.
- B. Installation
  1. Drill holes using concrete drill bits and impact type drill motors. Hole diameter shall be in accordance with the manufacturer's recommendations.

2. Clean drilled hole using compressed air to dislodge and remove drilling dust.
3. Accurately locate concrete anchors and set anchors with axis perpendicular to surfaces from which they will project.
4. Do not disturb adhesive anchors until cure time has elapsed.
5. Unless otherwise indicated on the Drawings or as required by structural calculations prepared by the equipment supplier, comply with minimum embedment lengths identified in the following table.

Minimum Embedment Lengths for Concrete and Adhesive Anchors

Diameter of Anchor or Bar, inches	Embedment Length for Concrete Anchors, inches	Embedment Length for Adhesive Anchors or Reinforcing Bars
1/4	1-3/4	As indicated on the Drawings
3/8	1-7/8	
1/2	2-1/4	
5/8	2-3/4	
3/4	3-1/4	
<sup>(1)</sup> Provide longer embedment where otherwise indicated		

**END OF SECTION**

**SECTION 11125**  
**BULK WATER FILL STATION**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Required backflow preventer, controls and software that shall, as a minimum, identify permitted users, dispense a specified volume of water and communicate the data for each transaction effortlessly to an administrator's office PC and other networked PCs.
- B. Furnish, install and place into operation a complete station for dispensing bulk potable water.

1.02 SUBMITTALS

- A. Product Data:
  - 1. Bulk Water Fill Station
  - 2. Accessories for Bulk Water Fill Station
    - a. PLC
    - b. Radio
    - c. Conduit
    - d. Cable
    - e. Disconnect switch
    - f. Antenna
    - g. Management Software

1.03 QUALITY ASSURANCE

- A. The control system and software furnished under the section shall be provided by a manufacturer who has been regularly engaged in the design and manufacture of bulk water filling systems for at least 10 years.
- B. The approved manufacturer of the control system and software shall be required to demonstrate a fully functional system that complies with this specification. The manufacturer shall provide a WEB presentation to show how the control system and software shall work.
- C. The control system shall be manufactured in accordance with all local and applicable standards and shall be inspected as an "Industrial Control Assembly" with either UL508A or CSA label identification.
- D. The manufacturer shall provide documentation necessary for the installation and operation of all associated components of the control system.
- E. The control system and software shall be furnished complete. All features outlined in this specification shall not impose any obligation to the SCADA supplier or the owner of the facility. Any control systems and software that reference these features as being provided by SCADA shall not be accepted on this project.

#### 1.04 WARRANTY

- A. The manufacturer shall guarantee all controller components furnished as part of this specification for a period of two (2) years from date of shipment.
- B. The manufacturer shall provide software updates and phone support services for a period of two (1) year from date of shipment.

#### 1.05 APPROVED MANUFACTURER

- A. The fill station, control system and software shall be by EleMech Inc. of Aurora, IL.

#### 1.06 TRAINING

- A. The manufacturer shall provide a minimum of eight (8) hours of online orientation and WEB-based training for initial software installation and configuration.

#### 1.07 USAGE AND LICENSING

- A. The manufacturer shall provide a multi-user software license to the facility. The license shall allow the software to be installed on multiple PCs at no additional cost.

### **PART 2 - PRODUCTS**

#### 2.01 BULK WATER FILL STATION AND BASE

- A. The manufacturer shall provide an access station and base. The access station shall include a keypad, card reader, and digital display for users to log on and enter a specific volume of water to be dispensed and purchased. The base shall include the electronic metering device and valve. The station and base shall be constructed and tested as an assembly prior to delivery at the site.
- B. Hauler access shall be established using a keypad and/or identification swipe card.
- C. The Bulk Water Fill Station shall be constructed with an outer door that can be closed to enable a wash down of the area without damaging the internal mounted devices.
- D. Once identified, the Hauler shall access the station by opening the door to the enclosure and entering their PIN into the keypad.
- E. The Bulk Water Fill Station shall include a daylight visible display and outdoor-rated robust keypad. The display shall provide log-on instructions for the hauler and prompt the hauler for additional information.
- F. The Bulk Water Fill Station shall continue to function normally even without a network connection to the office. All hauler transaction data shall be stored in non-volatile memory. If a network connection is established, all transaction data shall be automatically synchronized and stored securely in an IT managed SQL database.
- G. The Bulk Water Fill Station shall be maintained without requiring Arc Flash protective clothing. All permitted personnel shall be able to access the Hauler Access Station without high risk. Motor Starters or other high voltage devices must be located in a separate control panel. Control circuits greater than 24VDC shall not be accepted.

- H. The Hauler Access Station shall include the following components:
1. Enclosure
    - a. NEMA 4X Stainless Steel
    - b. Internal Swing-out Door (Stainless Steel)
    - c. Lockable Full-Grip Handle with 3-Point Latch
    - d. Drip Shield
    - e. Thermally Protected
    - f. Instruction Prompts
  2. Access Keypad/Display
    - a. Secure, Robust, and Outdoor Rated
    - b. Clear, Backlit LCD Display, Visible in All Levels of Light
    - c. Compliant with Local and Global Security Standards
    - d. Advanced Tamper-Proof Design
  3. Programmable Logic Controller, PLC, Including:
    - a. Ethernet Connection to PortALogic Software
    - b. Allen-Bradley MicroLogix type
    - c. Configurable Spare Analog and Digital I/O
    - d. Printer Interface
    - e. Detachable Terminals
    - f. Non-Volatile Memory
  4. Pilot Devices
    - a. Heavy Duty, 30mm. AB Type 800H or Equal
    - b. Provided as required
  5. 24VDC Power Supply
    - a. Contractor shall provide a circuit breaker for service connection for 120V AC power. The Contractor shall also provide the 24V DC for the PLC and other functions.
  6. Radio, antenna, and mast.
    - a. Antenna: 902-960 MHz 10dBd Yagi Antenna, GE MDS 97-3194A14 or approved equal
    - b. Radio: Orbit ECR High Performance Unlicensed 900 MHz, GE MDS ECRU91NNNNNS1D1USUNNN or approved equal
    - c. Mast: Schedule 40 Galvanized Steel Pipe secured to bulk fill station enclosure by two (2) Unistrut channels.
  7. Ethernet Switch (Non-Managed)

2.02 HAULER ACCESS STATION VALVE ENCLOSURE (FS-22)

- A. Hauler access station detailed above shall be mounted to the valve and meter enclosure, which will house the process devices and piping.

- B. Associated electrical, instrumentations, HVAC, and piping shall be factory installed and tested prior to shipping.
  - 1. Enclosure
    - a. Type 304 Stainless Steel
    - b. Internal frame brackets for pad anchoring
    - c. Lockable front entry access doors
    - d. Thermally protected for cold weather installation
    - e. Powered freeze protection
    - f. Approximate Dimensions: 42"Hx24"Wx24"D
  - 2. Control Valve and Flowmeter
    - a. 24VDC Solenoid Controlled
    - b. Flow Rate Transmitter, Pulse Type
    - c. Totalizer
    - d. +/- 2% Accuracy
    - e. Cast Iron Body and Cover
    - f. Throttled Open/Close to prevent water hammer

#### 2.03 MANAGEMENT SOFTWARE

- A. The necessary management software shall be installed on one or more site owned PCs. The PC(s) must have a network card to communicate with Hauler Access Stations. The PC(s) must have Windows 7 or newer.
- B. The software shall allow local or remote networked PCs to seamlessly interface with one or more Hauler Access Stations at one or more receiving sites using an Ethernet Connection.
- C. The software shall monitor the Hauler Access Station(s) and automatically upload hauler transaction data to the networked office PC(s).
- D. The data from each hauler transaction shall be collected and stored in a secure SQL database. The following data shall be collected:
  - 1. Site ID
  - 2. Station ID
  - 3. Ticket Number
  - 4. Hauler ID
  - 5. Date and Time of Transaction
  - 6. Volume Unloaded
  - 7. Water ID
  - 8. Alarm ID
  - 9. Five (5) additional fields will be available for the administrator to define.

- E. The software shall be used to configure the hauler’s pin number, magnetic-stripped card, and/or proximity card used at the Hauler Access Station(s).
- F. A user-friendly interface shall be provided to allow the facility to view hauler transaction data and enter/edit information when necessary. The software shall have a built in sorting tool that allows the user to create multiple data views. The software shall have a “Main Screen” view that displays all transaction data divided into the following sections:
  - 1. Transaction Log
  - 2. Customers
  - 3. Truck Status
  - 4. Customer Balances
  - 5. Link to Reports
- G. The software shall allow the facility to define the Hauler Access Station’s operating time schedule. If the station is closed, a message will alert the hauler that the station is closed.
- H. Customer (Hauler) and Truck Features:
  - 1. The software shall allow the facility to create a list of customers that will be billed for use of the Hauler Access Station(s). The software shall not limit the facility as to the number of customer accounts that can be created.
  - 2. The software shall allow the facility to create multiple truck accounts and link these accounts to the corresponding customers. The software shall not limit the facility as to the number of trucks that can be assigned to each customer.
  - 3. The facility shall be able to enter customer ID numbers, pin numbers, and details regarding the truck including capacity, weight, and vehicle information into the system.
  - 4. Each customer shall receive a Hauler ID number and 4-digit PIN number for each truck. PIN number assignment can be unique per owned truck or common to all owned trucks, depending on the facility and customer preference. The software shall auto-generate customer PIN numbers or shall allow the administrator to manually assign pin numbers to customers.
  - 5. The software shall allow the facility to enable or disable a truck’s access privilege. Once disable, a hauler’s access will immediately be denied at all sites. A message shall be displayed at log-in at the hauler station informing the hauler to contact the office.
- I. Water Type Features:
  - 1. The software shall allow the facility to define a list of permitted water types and an associated rate to be charged per 1000 units of water. The software shall allow the facility to define these units. (Gallons, Liters, etc...) The facility shall also be able to set different rates for the same water type. (Ex. Charging In-county customer vs. out-of-county customer)
  - 2. When accessing the station, the customer shall be prompted at log-in to identify the water type that shall be dispensed.

J. Status and Alarm Features:

1. The software shall allow the facility to monitor the Hauler Access Station in real-time. The facility shall be able to monitor the current customers/trucks total flow, water types, valve status, equipment faults, and additional user-defined variables.
2. The software shall allow the facility to monitor alarms at the Hauler Access Station. Alarms make the station unusable or may prevent a hauler from unloading. These alarms include:
  - a. E-Stop pressed
  - b. Equipment Fault
  - c. Optional User-Defined Alarm (20 Available)

K. Reporting, Billing, and Payment Features:

1. The software shall allow the facility to manage each customer on a debit or credit basis. The facility shall choose whether customers shall pay prior to using the Hauler Access Station or after.
2. The software shall debit account balances automatically and auto-deactivate the truck's access privilege should the customer's balance drop below the set minimum. The facility shall be able to set the minimum.
3. The software shall allow the facility to bill on a truck capacity basis, a metered basis (flow-meter or scale), or by manual entry.
4. The software shall allow the facility to enter payments if required. The total balance shall automatically recalculate once a payment is applied. A customer's account that is deactivated shall be automatically reactivated once money is received.
5. The facility shall be able to use the features of the software to substantiate the data recorded from each transaction and accurately calculate the total cost on a per customer basis.
6. The software shall have multiple pre-formatted reports that will, at a minimum, show activity with daily totals, statements, and customer and truck usage. The software shall also allow the facility to generate billing statements that can be exported for accounting use. The reports and billing statements shall be easily exported into PDF, CSV, XLS, and other formats.

2.04 ELECTRICAL COMPONENTS

A. PVC Conduit (PVC-40)

1. Shall be high impact polyvinylchloride suitable for use underground, direct burial and for use with 90 C wires, and shall conform to UL 651. PVC conduits shall be UL listed and labeled for "direct" burial.
2. A copper bonding conductor shall be pulled in each raceway and bonded to equipment at each end with approved lugs.
3. Buried bends and elbows shall be by PVC factory sweeps solvent welded to the buried conduit.

4. Risers shall be made with rigid aluminum (AL) conduit using threaded adapters. Bond each metallic portion to each other and to equipment connected at each end of conduit run. Metallic risers in contact with earth should be wrapped in 10 mil tape or equivalent. Metallic bend may be field bend sweep or factory bend sweep.
5. PVC fittings shall have watertight solvent-weld-type conduit connections.
6. PVC conduit shall be stored on a flat surface and shielded from the sun.
7. PVC conduit shall not be used above grade.

B. Rigid Aluminum Conduit (AL)

1. Rigid aluminum conduit, couplings, bends and nipples shall be in accordance with ANSI C80.5 and UL-6A.
2. Provide threaded type fittings, couplings, and connectors; set screw type and compression type are not acceptable.
3. Minimum trade size - three-quarters inch ( $\frac{3}{4}$ " ) unless otherwise shown on Contract Drawings.
4. Conduits entering enclosures shall be fitted with insulated grounding bushing; O-Z "HBLG", Appleton "GIB", or approved equal. All grounding bushings shall be tied to the grounding system with properly sized bonding conductors per the NEC code.
5. Rigid aluminum field or factory elbows for 90 degree transitions.
6. EMT or IMC is not considered an equivalent to AL.

C. Grounding

1. The utility service entrance switch and equipment grounding shall be tied to a ground rod.
2. The main ground bonding wire from the ground shall extend up into the utility service entrance for the visible connection with a UL approved "ground clamp" attached to the ground rod. The main ground bonding wires shall be #6 AWG copper.
3. The ground rod shall consist of not less than 10 continuous feet of  $\frac{3}{4}$ -inch copper coated electroplated high grade carbon steel. The ground rod shall be an Eritech 613400, NEHRING type NCC, Weater 348 or approved equal.
4. Ground clamps shall be bolt-on type as manufactured by ILSCO type AGC, O-Z Gedney Type GRC, Burndy Type GAR or GP, or approved equal.
5. All ground rod, pipe, and steel plate and buried bond connections shall be made by welding process equal to Cadweld.
6. Provide a 13 inch diameter, 9-inch nominal throat, traffic rated concrete ground rod box, minimum 12 inches deep, with a cast iron traffic cover embossed or engraved "GROUND."
7. Ground buses shall be provided in all electrical enclosures. Each ground bus shall be sized as shown on the Contract drawings or specified herein. The

ground bus shall be adequately sized for the connection of all grounding conductors required per NEC. Screw-type lugs shall be provided on all ground busses for connection of grounding conductors.

8. Each ground bus shall be copper. Screw type fasteners shall be provided on all ground busses for connection of grounding conductors. Ground bus shall be a Challenger GB series, ILSCO D-167 series, or approved equal.
9. Attachment of the grounding conductor to equipment or enclosures shall be by connectors specifically provided for grounding. Mounting, support, or bracing bolts shall not be used as an attachment point for ground conductors.
10. All raceway systems, supports, enclosures, panels, and equipment housings shall be permanently and effectively grounded.
11. One side of the secondary on all transformers shall be grounded.
12. The system neutral (grounded conductor) shall be connected to the system's grounding conductor at only a single point in the system. This connection shall be made by a removable bonding jumper sized in accordance with the applicable provisions of the National Electrical Code if the size is not shown on the Drawings. The grounding of the system neutral shall be in the enclosure that houses the service entrance main over-current protection.
13. The system neutral conductor and all equipment and devices required to be grounded by the National Electrical Code shall be grounded in a manner that satisfies the requirements of the National Code.
14. Grounding conductors shall be sized as shown on the Plans or in accordance with NEC Table 250.122, whichever is larger.
15. Grounding and bonding wires shall be installed on all conduits with grounding bushings, expansion joints and for continuity of raceways transitions. Bonding wires at endpoints shall be connected to enclosure ground bus or equipment grounding lug.
16. Conduit grounding bushings shall be installed on all metallic conduits. Conduit grounding bushings shall be set screw locking type electra-galvanized malleable iron with insulation collar and shall be provided with a feed through compression lug for securing the ground bonding wire. Ground bonding wire shall be bare wire and shall be sized per NEC.
17. All receptacles shall have their grounding contact connected to a grounding conductor.
18. Branch circuit grounding conductors for receptacles, or other electrical loads shall be arranged such that the removal of a lighting fixture, receptacle, or other load does not interrupt the ground continuity to any other part of the circuit.
19. Negative side of all VDC power supplies shall be grounded.

D. Circuit Breakers

1. Circuit breakers shall be of the indicating type, providing ON, OFF and TRIPPED positions of the operating handle. Circuit breakers shall be quick-make, quick-break.

2. The use of tandem or dual circuit breakers in a normal single-pole space to provide the number of poles or spaces specified are not acceptable. All multiple-pole circuit breakers shall be designed so that an overload on one pole automatically causes all poles to open. Main Circuit breakers and motor circuit protectors shall be manufactured by Eaton, G.E., ITE, or approved equal.
3. Each 120 volt breaker shall be rated for a minimum 10,000 amperes interrupting capacity. Breakers shall be sized as necessary for the supplied equipment, anticipated full load amps of 6 amps.
4. Fused disconnects shall not be used in place of breakers.
5. Breakers shall be sized and have a minimum interrupting capacity as required for the supplied equipment.
6. All breakers shall be supplied with the correct sized copper only lugs for wire sizes. Provide larger frame breaker or lug adapters as necessary when connecting to the listed oversized wire.
7. Circuit breaker shall be housed in surface mounted loadcenter, mounted on the back of the fill station. Housing shall have
  - a. NEMA 3R rating.
  - b. Pad lockable door.
  - c. Ground bar kit
  - d. 125 amp rating
  - e. Eaton Model CH2L125RP, equivalent Seimens loadcenter, or equal.

E. Wire

1. All wires shall be properly fused or protected by a breaker at the amperage rating allowed by the NEC.
2. Material: Wire shall be new, plainly marked with UL label, gauge, voltage, type of insulation, and manufacturer's name. All wire shall conform to the following:
  - a. Conductors shall be copper, with a minimum of 97% conductivity.
  - b. Wire shall be Class B stranded. Solid wire conductor prohibited.
  - c. ASTM B8, soft drawn copper, maximum 12 months old.
  - d. Insulation of all conductors and cables shall be rated 600 volt.
  - e. Insulation type for all conductors shall be moisture and heat resistant thermoplastic NEC Type XHHW-, rated 90 °C in dry locations and 75 °C in wet locations, or approved equal.
  - f. Field wire minimum AWG sizes
    - 1) #12 for wires used for individual conductor circuits 480 volt and above. #12 for wires used for individual conductor circuits 100 volt and above, except for PLC I/O which may be #14 AWG.
    - 2) #14 for wires used for individual conductor circuits below 100 volt.

- g. Non-field or panel wire minimum AWG sizes if properly protected by fuse or breaker:
  - 1) #14 for wires used for individual conductor circuits 100 volt and above.
  - 2) #18 for wires used for individual conductor circuits below 100 volt and above if properly protected by fuse or breaker.
- h. Instrument Wiring
  - 1) Field: Instrument cables shall have 600V tray cable rated insulation and 100% individual shielded twisted pair #16 conductors with drain wire. Single twisted shielded pair (T.S.P.R.) Cables shall be Belden, Manhattan, or approved equal.
  - 2) Non-Field: Instrument cables shall have 300V rated insulation and 100% individual shielded twisted pair #18 conductors with drain wire. Single twisted shielded pair (T.S.P.R.) cables shall be Belden, Manhattan, or approved equal.
  - 3) General: Instrument cables shall have 600V rated insulation and 100% individual shielded twisted pair #16 conductors with drain wire. Single twisted shielded pair (T.S.P.R.) cables shall be Belden, or approved equal.

#### F. Wire Marking

1. Wire Identification: All wire terminations including field interconnect as well as wiring interior MCC cubicles, switchboard, panels, equipment, junction panels and boxes shall be identified with machine printed labels. Hand lettered labels are not acceptable and shall be replaced at the Contractor's expense. The wire identification code for all field interconnect and panel interior wiring, shall be similar to the designations shown on the Contract example drawings.
2. Wire Labels: The labels shall be machine printed with indelible ink, heat shrink type capable of accepting a minimum of 23 machine printed characters per sleeve label by Brady "Bradysleeve" or equal. Labeling shall be neatly installed for visibility and shall be clearly legible. Each wire and conductor shall be labeled with wire label as shown on approved loop, elementary and interconnect Drawings. Labels shall not be wrap around or snap-on type.
3. Where there is insufficient space for labels on locally interconnected neutral wires such as jumpers between adjacent auxiliary relay coil neutral terminals, these labels may be omitted. "Locally" is defined as wires no longer than 8".
4. Wire labels for lighting and receptacles shall be installed and consist of the panelboard and circuit number (i.e., Panelboard "LP100", circuit breaker #3 would have wire label line "LP100-L3" and neutral "LP100-N3").
5. All spare wires shall be labeled with equipment number followed by X1, X2, etc. (i.e. P11001-X1 for first spare wire).
6. All control and signal wiring terminations shall have the correct wire label applied prior to making connection.

G. Wire. Color Code

1. Color code of all wire shall conform with the wire color code table below.
2. The same color shall be connected to the same phase throughout the panel.
3. All wires shall be properly fused or protected by a breaker at the amperage rating allowed by the NEC.
4. Neutral used for AC Control shall be white.
5. Phase color insulation shall be provided for complete length of #8 wire or smaller, colored phase tape is not allowed on #8 and smaller wire.

**WIRES COLOR CODE TABLE**

Description	Phase/Code Letter	Field Wire or Tape Color	Non-Field Wire Color
480 V, 3 Phase	A	Brown	Brown
	B	Orange	Orange
	C	Yellow	Yellow
240 V or 208 V, 3P	A	Black	–
	B Red (Orange if high leg)	–	–
240 / 120 V, 1 P	C	Blue	–
	L1	Black	Black
12 V Positive	L2	Red	–
	12P	Dark Blue	Dark Blue
12 V Negative	12N Black/Red Stripe	Black/Red Stripe	–
24 V Positive	24P	Pink	Pink
24 V Negative	24N Black/White Stripe	Black/White Stripe	–
AC Control		Violet Red	(Yellow for Foreign Circuits)
DC Control		Blue	Blue
Neutral	N	White	White
Ground	G	Green	Green
Shielded Pair	+	Black	Black
	–	Clear (White)	Clear (White)

**PART 3 - EXECUTION**

3.01 SEQUENCE OF OPERATION

A. Log-On Sequence

1. Hauler shall open exterior door and present their swipe card (or ID number)

2. Hauler shall enter their PIN and required volume of water.
3. Upon authorization, the 'System Ready' light will energize and the discharge valve shall become active
4. The hauler may now press 'Start' to begin the flow of water.
5. The hauler may press 'Pause' at any time to temporarily halt the flow of water. Pressing it again will restart the flow.

B. Log-Off Sequence

1. The transaction will automatically stop once the required volume has been dispensed or if the hauler pressed the 'Stop' button.
2. The valve shall close and a receipt will be printed for the hauler.

C. Alarm Shutdown

1. The Log-off sequence will automatically be initiated if an alarm is triggered.
2. Possible alarm triggers:
  - a. Station permissive signal removed.
  - b. Valve fault.
  - c. Other defined fault conditions.

**END OF SECTION**

**SECTION 13410**  
**TURBINE FLOW METER**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Full-body turbine flow meters.

1.02 REFERENCED SECTIONS

- A. None

1.03 SUBMITTALS

A. Certifications

- 1. Manufacturer's certificates of compliance with the specified standards.
- 2. Calibration certification.

B. Product Data

- 1. Drawings and descriptions of meters, particularly connections.
- 2. A real-time computer generated printout of the actual calibration data indicating apparent and actual flows at 20 percent, 40 percent, 60 percent, 80 percent and 100 percent of the calibrated range shall be submitted to the Engineer for approval prior to ordering/shipping of the meters.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver the turbine flow meter to the project site per manufacturer's recommendations and in the original packaging.
- B. Repair any damage per the manufacturer's recommendations at no additional cost to Owner.
- C. Store in original packaging, off the ground, per manufacturer's recommendations.

1.05 QUALITY ASSURANCE

A. Verify the instruments are compatible with the installation conditions including:

1. Process conditions:

- a. Recycled water
- b. Temperature: 50 to 70 degrees Fahrenheit
- c. Pressure: 20 to 150 pounds per square inch (psi)
- d. Velocity: 0 to 20 feet per second (ft/s)

2. Physical conditions:

- a. Installation and mounting as shown in drawings.
- b. Accessories: Verify that all required accessories are provided and are compatible with the process conditions and physical installation.

- B. Notify the Engineer if any installation condition does not meet the instrument manufacturer's recommendations or specifications.
- C. The manufacturer shall furnish certified test results for each meter showing that it has been tested for accuracy of registration according to manufacturer's specifications. Meter shall be  $\pm 1.5\%$  for the normal flow range when tested in accordance with AWWA Manual M6.

#### 1.06 COORDINATION

- A. The Contractor will be responsible for:
  - 1. Furnishing and installing the meter specified
  - 2. Running antenna wires as indicated on the Drawings.

### PART 2 - PRODUCTS

#### 2.01 TURBINE FLOW METER

- A. Meters shall conform to the material and performance requirements of AWWA C701 Class II as applicable and the specifications herein.
  - 1. Size:
    - a. 3-inch meter: Badger Turbo Series Model 450, no equal, to match existing equipment.
    - b. 4-inch meter: Badger Turbo Series Model 1000, no equal, to match existing equipment.
- B. Measuring Chamber Cover:
  - 1. Measuring chamber cover shall be Type 316 stainless steel.
- C. Communication
  - 1. Provide communication module (Orion) with cellular endpoints.
- D. Readings: Unaffected by changes in fluid pressure, temperature, viscosity, or conductivity.
- E. Flange connections: ANSI Class 150 (minimum) as required by Drawings.

#### 2.02 ACCESSORIES

- A. Weatherproof 3"x4" plastic tag, purple in color, with the words, "WARNING – RECYCLED WATER – DO NOT DRINK" or similar imprinted on one side, and "AVISO – AGUA IMPURA – NO TOMAR" on the other side, or similar as approved by engineer. Attach tag to all recycled water meters.

#### 2.03 SOURCE QUALITY CONTROL

- A. Perform wet calibration tests at the factory to verify meter operation for each meter supplied.
- B. Submit calibration certificate.

**PART 3 - EXECUTION**

3.01 INSTALLATION

- A. Install the meters in conformance with the Manufacturer’s written instructions.

3.02 FIELD SERVICES

- A. Provide field services for each meter as follows:
  1. Field services to be performed by a Manufacturer’s certified technician paid for by the Contractor.
  2. Initial Inspection: Perform an initial inspection of each meter installation and confirm the meter has been installed in conformance with the Manufacturer’s requirements.
  3. Start-up and performance demonstration: Following completion of the pipeline installation, installation of the electronic components by the City, and within two weeks’ notification from the City, perform start-up and verification of proper meter operation in conjunction with the City staff. Provide up to 8 hours technician field time for each meter.
  4. Replace meters that fail to calibrate or operate in conformance with the requirements.
  5. Following successful start-up and operation, submit a field compliance memo signed by the field technician indicating that the meter was installed in conformance to the Manufacturer’s recommendations.

**END OF SECTION**

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**SECTION 15050**  
**GENERAL PIPING**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Contractor furnished, installed, tested, and complete piping in accordance with the Contract Documents.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section.
  - 1. Section 01330 – Submittals
  - 2. Section 02241 – Control of Water
  - 3. Section 02320 – Trenching
  - 4. Section 15143 – Ductile Iron Pipe
  - 5. Section 15996 – Testing Pressure Piping

1.03 QUALITY ASSURANCE

- A. Like items of materials provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance and manufacturer's service.
- B. To assure uniformity and compatibility of piping components in grooved-end piping systems, fittings and couplings shall be furnished by the same manufacturer.

1.04 GENERAL

- A. Construction materials proposed to be used shall be new materials approved by the Engineer prior to start of construction.
- B. Where material specification numbers are used herein, they shall refer to the latest revision thereof.
- C. Pipe Installed by Open Cut Method
  - 1. The recycled water pipelines and fittings to be installed by open cut method shall be ductile iron, except as otherwise shown on the plans or specified.

1.05 SUBMITTAL

- A. Submit installation instructions and details of all pipe, joints, fittings, metallic pipeline marking tape, and appurtenances to be used in the work.
- B. The review of procedures and equipment by the Engineer shall not relieve the Contractor of his responsibility nor modify any of the provisions of the contract.
- C. Pipe: Furnish shop drawings for pipe in accordance with the requirements of Section 15143 as follows.
  - 1. Details of the pipe to be used. Submit shop drawings indicating the details of all reinforcement, thickness, joints, materials, and procedures, as applicable. Indicate the required fabrication tolerances for the pipe.

2. Information indicating that pipe manufacturer meets the experience requirements indicated below.

## **PART 2 - PRODUCTS**

### **2.01 GENERAL**

- A. Provide required piping and fittings in accordance with the individual piping sections.

### **2.02 WARNING TAPE**

- A. Warning tape shall consist of purple metallic warning tape with the words "Caution: Recycled Water Line Buried Below" printed continuously along its length with letters approximately 3/4-inch high at maximum intervals of 2 feet.
- B. Submit samples of the tape in accordance with Section 01330.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Dewatering
  1. Comply with the requirements of Section 02241.
- B. Verification of Existing Facilities
  1. Where connections are to be made to an existing facility, uncover and check for location and elevation prior to submitting shop drawings. Any discrepancy between the Plans and field information shall be reported immediately to the Engineer.
- C. Handling of Pipe
  1. Carefully lower pipe and accessories into the trench or jacking pits in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the excavation.
  2. Protect pipe against impact shocks during handling. Prior to making pipe joints, all surfaces of the portion of the pipe to be joined shall be cleaned, dried, primed or otherwise repaired in accordance with the manufacturer's installation instructions. Keep the interior of all pipe free from all dirt and foreign matter as the work progresses.
  3. At the close of each day's work, and at such other times when pipe is not being installed, the ends of all open pipes shall be closed with a watertight plug or cap.
- D. Field Cutting Pipe
  1. Use whole lengths of pipe wherever possible. Short lengths or cut pieces shall be allowed only to complete connections to structures and other required fittings.
  2. Unless otherwise permitted by the Engineer, pipes that must be cut in the field shall be cut with mechanical cutters or as recommended by the pipe manufacturer.

### 3.02 EXCAVATION AND TRENCHING

- A. Perform all excavations for pipelines and appurtenances, of whatever substances encountered, to the depths indicated in the Contract Documents and in accordance with Section 02320.

### 3.03 INSTALLATION

#### A. General:

1. Each pipe and fitting shall be carefully inspected before the pipe or fitting is installed. The interior and exterior protective coating shall be inspected, and all damaged areas patched in the field with material similar to the original. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after laying.
2. Clean out fittings and pipe sections before installing.
3. Furnish and assemble pipe and fittings to provide accurate alignment for joints.
4. Make all joints watertight.
5. Use an anti-seize compound on all bolt threads. Manufacturer's instructions for application shall be followed. The anti-seize compound shall be designed to prevent rusting and seizure of bolt threads and to prevent galling of stainless steel.
6. Provide temporary plugs or bulkheads for closure of the open ends of piping whenever work is stopped.
7. Use proper implements, tools, and facilities for the safe and proper protection of the pipe. Carefully handle pipe in such a manner as to avoid any physical damage to the pipe. Do not drop or dump pipe into trenches under any circumstances.

#### B. Buried Pipe (Open-cut Installation):

1. Install in accordance with manufacturer's instructions.
2. Joint Deflections
  - a. The deflection in the joint between any two successive pipe sections shall not exceed 50 percent of the maximum deflection as recommended by the pipe manufacturer.
3. Curved Pipe
  - a. Curvature of the pipe shall be accomplished through longitudinal bending of the pipe barrel. Where longitudinal bending of the pipe segment is used to curve the pipe alignment, deflection at either joint is not allowed and may cause leakage.
4. General
  - a. Grade the bottom of the trench by hand to the line and grade to which the pipe is to be laid, with proper allowance for pipe thickness and for sand bedding when required. Remove hard spots that would prevent a uniform thickness of bedding. Before laying each section of the pipe, check the grade with a straight edge and correct any irregularities found.

The trench bed shall form a continuous and uniform bearing and support for the pipe at every point between bell holes, except that the grade may be disturbed for the removal of lifting tackle.

- b. At the location of each joint, dig bell (joint) holes of ample dimensions in the bottom of the trench and at the sides, where necessary, to permit easy visual inspection of the entire joint.
- c. Provide and maintain ample means and devices at all times to remove and dispose of all water entering the trench during the process of pipe laying. The trench shall be kept dry until the pipe laying and jointing and backfill are completed.
- d. When the pipe laying is not in progress, including the noon hours, the open ends of pipe shall be closed by approved means, and no trench water, animals, or foreign material shall be permitted to enter the pipe.
- e. Minimum pipe cover in the trench shall be as shown on the Drawings.
- f. Buried pipe shall be prepared as herein before specified and shall be laid on the prepared granular base and bedded in accordance with the Contract Documents to ensure uniform bearing. No pipe shall be laid in water or when, in the opinion of the Engineer, trench conditions are unsuitable. Joints shall be made as herein specified for the respective types. Take all precautions necessary to prevent uplift and floating of the pipe prior to backfilling.
- g. Mains and laterals installed by open cut methods shall be installed with purple metallic marking tape indicating the presence of the buried pipeline. The tape shall be within the trench as shown on the Drawings.

### 3.04 FITTINGS

- A. Fittings shall be sized to receive the type of pipe specified. Installation of fittings will be in accordance with manufacturer's recommendations.

### 3.05 STORAGE

- A. Store pipe in strict accordance with the manufacturer's requirements. Typical requirements for flexible pipe storage include:
  - 1. Pipe shall be stored, if possible, at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage, or deformation to the pipe joints and barrel. Pipe supports and straps installed by the manufacturer shall be maintained in place during storage.
  - 2. When unit packages of pipe are stacked, insure that weight or upper units do not cause deformation to pipe in lower units.
  - 3. Support pipe unit packages by struts, racks or dunnage to prevent damage to the bottom during storage. Specs supports to prevent pipe bending. Unit package supports shall be maintained during storage.
  - 4. When long-term storage with exposure to direct sunlight is unavoidable, flexible pipe shall be covered with an opaque material while permitting adequate air circulation above and around the pipe as required to prevent excessive heat accumulation.

5. Flexible pipe shall not be stored close to heat sources or hot objects such as heaters, boilers, steam lines, engine exhaust, etc.
6. Protect gaskets from excessive exposure to heat and sunlight.

### 3.06 PIPE COUPLINGS

- A. Use approved pipe couplings to join pipes of unlike materials and to join pipes of like materials when a splice is made. Install couplings as recommended by the coupling manufacturer. Couplings shall have type 316 stainless steel bands and hardware.

### 3.07 TESTING

- A. Complete in accordance with Section 15996.

### 3.08 CLEANING

- A. Exercise care during fabrication to prevent the accumulation of weld rod, weld spatter, pipe cuttings, and filings, gravel, cleaning rags, etc., within piping sections. All piping shall be examined to assure removal of these and other foreign objects prior to assembly. Shop cleaning may employ any conventional commercial cleaning method if it does not corrode, deform, swell, or otherwise alter the physical properties of the material being cleaned.
- B. Following assembly and testing and prior to final acceptance, flush pipelines installed under this Section with high-velocity water and remove all accumulated construction debris and other foreign matter only if deemed necessary by the Engineer. Flushing velocities shall be a minimum of two and one half (2-1/2) feet per second.

**END OF SECTION**

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**SECTION 15110.1**  
**GENERAL REQUIREMENTS FOR VALVES**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Requirements for valves.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
  - 1. Section 15111 – Gate Valves

1.03 REFERENCED SPECIFICATIONS

- A. Conform to the requirements of the City of Healdsburg Standard Specifications as modified herein.

1.04 SUBMITTALS

- A. Provide the following information, at a minimum:
  - 1. Shop drawings
    - a. Valves and actuators
  - 2. A schedule of valves indicating the label location, attachment method, and proposed label text for each valve.
  - 3. A schedule of responsible manufacturers for the project and contact information, planned site visits, and compliance tests to be performed.
  - 4. Design calculations, test and performance data, and other information required to substantiate that the valve units proposed will meet the performance requirements specified and shown.
  - 5. Protective Coatings: Manufacturer's data.

1.05 DEFINITIONS

- A. Responsible Manufacturer: Manufacturer or manufacturer's representative who will ensure satisfactory performance of equipment.
- B. Valve: Device for mechanically regulating pipeline or open-channel flow.
- C. Actuator: Devices added to obtain mechanical advantage or power assist in operation.

1.06 RESPONSIBLE MANUFACTURER

- A. Furnish, adjust, test, and ensure satisfactory performance of each valve.
- B. Provide any field adjustments, settings, and tests required for satisfactory performance of each valve at no additional cost to Owner.

1.07 QUALITY ASSURANCE

- A. Unless specified otherwise, factory test each valve body with a test pressure equal to twice the listed working pressure rating.

- B. Submit a certified copy of the pressure test reports for all valves over 12 inches in nominal size prior to shipping valves to the Site. Format these test reports per the requirements of the applicable reference standards.
- C. Storage and Preparation for Installation
  - 1. Package and store valves to prevent exposure to sunlight, chemical exposure, and atmospheric pollution.
  - 2. Inspect each valve prior to installation for damage. Repair any damage to seats, machined surfaces, or protective coatings before installation. Clean each valve to remove any dirt and debris from the interior surfaces and seat areas. Install valves in the closed position.
  - 3. Some valves must be installed with seats or seat adjustment rings on the downstream side of the valve. Determine these requirements prior to installation and install the valve in the correct orientation.

## **PART 2 - PRODUCTS**

### **2.01 GENERAL**

- A. Provide valves, gates, actuators, stem extensions, and other accessories as indicated on the Drawings or specified. All valves shall be new and of current design. For valves of the same type, provide identical valves supplied by a single manufacturer.
- B. Provide valves and actuators with the name of the manufacturer, nominal size, flow direction arrow, design working pressure, and the reference standard cast in raised letters or indelibly marked on an appropriate part of the body.
- C. Provide valves and actuators designed for submerged service for the following locations
  - 1. Located outdoors
  - 2. Within a building below the adjacent finished grade
  - 3. In vaults
  - 4. Where otherwise indicated. All other units shall be weather-tight and suitable for outdoor service.
- D. Provide buried valves with valve boxes and covers where indicated.
- E. Flanges, gaskets, and bolts for valves: in accordance with Section 15111.
- F. Unless otherwise specified, all interior bronze parts of valves shall conform to the requirements of ASTM B62.
- G. Wetted parts shall be lead-free as defined by California AB1953, California Prop-65, or the most stringent of current regulations.

### **2.02 PROTECTIVE COATINGS**

- A. Coat ferrous surfaces in water passages of all valves of size 2 inches and larger and exterior surfaces of valves and actuators, with epoxy per AWWA C550, unless otherwise specified in the valve specification.
  - 1. Interior Surfaces:

- a. Minimum dry film thickness: 8 mil
  - b. NSF/ANSI 61 approved.
- 2. Exterior Surfaces:
  - a. Above ground:
    - 1) Minimum dry film thickness: 8 mil
  - b. Buried, submerged or in blow ground vaults:
    - 1) Minimum dry film thickness: 12 mil
- B. Do not coat flange faces or bronze and stainless steel surfaces in water passages.
- C. Coat exterior bronze and stainless steel surfaces using the same system as the associated piping.
- D. Provide holiday-free protective coatings.

### 2.03 VALVE ACTUATORS

- A. Furnish valves and gates with an actuator as indicated in the valve Technical Specification.
- B. Assemble valve actuators to the valve, adjust, and test the completed unit by Responsible Manufacturer prior to shipment to the Site.

## PART 3 - EXECUTION

### 3.01 VALVE INSTALLATION

- A. Install valves per the manufacturer's written instructions and as indicated on the Drawings and specified.
- B. Fit, support and brace gates to prevent warping, binding, and bending under all operating conditions. Accurately position and support embedded parts cast into concrete during concrete placement.
- C. Assembly of Valves and Piping
  - 1. Install valves with piping per Section 15111 and per this Section.
  - 2. Install valves with piping prior to the assembled piping or attached supports being cast into concrete or attached to supports.
  - 3. Sequence construction and operations so that the adjacent piping supports the valves, and so that the valves do not support the piping. Where permanent supports are located at valves, install the supports after the piping and valves have been installed as a completed assembly on temporary supports.
  - 4. Install piping and valve assemblies so that the piping does not exert forces on the valves from settlement or assembly operations.
  - 5. Correct piping alignment deviations before the valve is joined to the piping.
  - 6. Unless shown otherwise, install butterfly, plug, and ball valves with the shafts in the horizontal position.
  - 7. Install gates, gate valves, and other types of valves with the stems in the vertical position.

- 8. For manually operated valves 3 inches in nominal size and smaller, orient the valve operators and indicators to be visible to the operator.
- D. Install floor boxes, valve boxes, extension stems, and floor stands vertically centered over the operating nut, with couplings as required. Adjust the elevation of the box top to conform with the elevation of the finished floor, grade, or pavement at the completion of the Work. Support boxes and stem guides during concrete placement to maintain vertical alignment and proper orientation.

3.02 TESTING

- A. Pressure test valves as part of the pipeline testing. Demonstrate valve operation (open/close) after the valve is installed including valve box and riser, as appropriate.
- B. Following installation, Owner may conduct holiday test for valves larger than 30-inch.

**END OF SECTION**

**SECTION 15111**  
**GATE VALVES**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Resilient seated ductile iron body gate valves.

1.02 REFERENCED SECTIONS

- A. None

1.03 SUBMITTALS

- A. Product Data: Provide manufacturer's catalog data, weights, dimensions, and assembly drawings with materials of construction.
- B. Demonstration of Compliance with Referenced Standard:
  - 1. Testing records per Section 5 of AWWA C515.
  - 2. Affidavit of compliance with AWWA C515.

**PART 2 - PRODUCTS**

2.01 RESILIENT SEATED GATE VALVES

- A. General Requirements:
  - 1. Use resilient seated type gate valves for valves 3-inches in nominal size and larger.
  - 2. Pressure Ratings:
    - a. Valves less than 16 inches in nominal size: 250 psi.
  - 3. Type:
    - a. Exposed Gate Valves: Non-rising stem type.
    - b. Buried Gate Valves: Non-rising stem type.
- B. Manufacturers: One of the following, or equal:
  - 1. American Darling
  - 2. M&H / Kennedy Valve Company, Model KS-RW.
  - 3. Clow Corporation
  - 4. Mueller Company, 2360 Series.
  - 5. AVK
- C. Valve Design:
  - 1. Body, Bonnet, and Wedge: Ductile Iron conforming to ASTM A536.
  - 2. Wedge: EPDM Rubber Encapsulated Ductile Iron, ASTM A536.
  - 3. End Connections: Unless otherwise indicated on the Drawings, provide valves with the following end connections:

- a. Exposed Gate Valves: Flanged ends conforming to ANSI B16.1, Class 125.
- b. Buried Gate Valves: Mechanical joint or push-on ends.
- 4. Stem: 316 Stainless Steel.
- 5. Stem Packing:
  - a. Non-rising stem valves: Provide with double or triple o-ring stem seals or with braided packing material.
- 6. Bolts and Nuts: 316 Stainless Steel
- 7. Operator Extension: As indicated on the Drawings.
- D. Valve Actuator:
  - 1. Exposed Gate Valves: Provide valve with manual handwheel actuator unless a powered actuator is indicated on the Drawings.
    - a. Valves 8-inch in Nominal Size and Larger: Provide geared type actuator.
  - 2. Buried Gate Valves: AWWA operating nut on a shaft that extends to within 6 inches below finished grade. Support shaft at 5 foot intervals with the last support just below the operating nut.
  - 3. Operation: Counter clock-wise to open.
- E. Coating:
  - 1. Coat interior and exterior of valve body and bonnet with fusion bonded epoxy.
    - a. Fusion bonded epoxy: Complying with AWWA C550 and NSF/ANSI 61 approved.
    - b. Exposed Gate Valves: Exterior Coating color shall be Pantone 512 (Purple).

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION**

- A. Install valves in accordance with the manufacturer's recommendations.
- B. Repair damaged areas of epoxy coating in accordance with AWWA C550 such that coating is free of holidays and other defects.

**END OF SECTION**

**SECTION 15112**  
**BUTTERFLY VALVES**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Metal body butterfly valves for water service.
- B. Valve actuators specified include manually-operated actuators as scheduled.

1.02 UNIT RESPONSIBILITY

- A. Responsibility of the butterfly valve manufacturer extends to the proper selection and furnishing of the valve and actuator combination.

1.03 GENERAL PERFORMANCE AND DESIGN REQUIREMENTS

- A. Butterfly valves shall be designed and manufactured in accordance with AWWA C504. Valve design based on a maximum water velocity through the valve of 16 feet per second with valve fully open.
- B. Valve Body for Exposed Service:
  - 1. Provide flanged butterfly valves.
- C. Flange Drilling: In accordance with ANSI B16.1, Class 150.

1.04 SUBMITTALS

- A. Product Data: Manufacturer's standard catalog information and data on valve and valve actuator.
- B. Valve Operating Characteristics: Manufacturer's recommended seating and unseating torque coefficient, dynamic torque and bearing friction for calculation of maximum operating torque.
- C. Installation Drawings: Illustrate orientation of valve actuator.
- D. Certificates: Affidavits of compliance with AWWA C504.

**PART 2 - PRODUCTS**

2.01 BUTTERFLY VALVES

- A. Materials
  - 1. Size 3 inches:
    - a. Shaft: Stainless steel, ASTM A276, Type 316
    - b. Disc: Ductile iron, ASTM A536 Grade 65-45-12
    - c. Disc Edge: Stainless steel, ASTM A276, Type 316
    - d. Seat Sealing Surface: Buna N or EPDM.
    - e. Body: Cast iron, ASTM A126, Class B

B. Design

1. AWWA Class: Provide valves conforming to AWWA C504 Class 150B.
2. Disc: Lens-shaped with a flat surface and curved surface.
3. Shafts and Bearings:
  - a. Valve shafts shall be fabricated of AISI Type 304 or 316 stainless steel. The use of shafts having a hexagonal cross section will not be acceptable.
  - b. Turned, ground and polished.
  - c. Select shaft diameter for the pressure requirements identified for adjacent pipeline materials and Class B as specified in AWWA C504.
  - d. When carbon steel shafts and stainless steel journals are used, provide static seals to isolate the interior of the disc and the shaft from the process fluid.
4. Resilient Seats:
  - a. Acceptable seating surfaces mating with rubber are AISI Type 304 or 316 stainless steel, monel, or plasma-applied nickel-chrome overlay for all valves, bronze and alloy cast iron.
  - b. Valve sizes 3 inches to 24 inches: Vulcanized, bonded, mechanically secured, or clamped to the valve body. Cartridge type seats that rely on a high coefficient of friction for retention within the valve body are not acceptable.
5. Ten position locking lever with provision for locking in any of the ten positions using a standard padlock.
6. Coating:
  - a. Exterior and interior surfaces of butterfly valves shall be coated per AWWA C504.

C. Manufacturers:

1. The manufacturer shall have produced AWWA butterfly valves for a minimum of five years.
2. One of the following or equal:
  - a. DeZurik BAW

2.02 MANUAL ACTUATORS

A. General

1. Designed in accordance with AWWA C504.
2. Provide disc position indicator designating the opened and closed position of the valve.
3. Direction of Rotation: Counterclockwise for opening.

B. Manual Actuators for Butterfly Valves

1. Above Grade Service Valves:

- a. Provide a lever actuator in standard position.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION**

- A. Install butterfly valves in accordance with the manufacturer's published recommendations.
- B. Before installation, clean the seat and sealing edge of the disc.
- C. Do not scratch or damage the flange gasket sealing surfaces, the valve seat or the sealing edge of the disc.
- D. Mount butterfly valves with the shaft in the horizontal position.
- E. Install butterfly valves so that the flat side of the closed disc is on the higher pressure side.

#### **3.02 TESTING**

- A. Test valves at the same time that the adjacent pipeline is tested. Joints shall show no visible leakage under test. Joints that show signs of leakage shall be repaired prior to final acceptance. If there are any special parts of control systems or operators that might be damaged by the pipeline test, they shall be properly protected. The Contractor shall be held responsible for any damage caused by the testing.
- B. If requested by the Engineer, the valve manufacturer shall furnish an affidavit stating the materials options furnished, and/or that these and other referenced specifications have been complied with.

**END OF SECTION**

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## SECTION 15114

### BALL VALVES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. 3-Way Ball Valves 1-inh in size for control of recycled water altitude valve.
  - 1. Type: Continuous service type.
- B. 2-Way Ball valves up to 1inch in size for control of pressure and flushing at recycled water swivel-ell connections and operation of altitude valve.
  - 1. Type: Open and close service type.

##### 1.02 SUBMITTALS

- A. Include the following items:
  - 1. Manufacturer's data, performance data, wiring diagrams, and outline drawings.
  - 2. Operating and maintenance information.

##### 1.03 QUALITY ASSURANCE

- A. Unit Responsibility
  - 1. Assign unit responsibility to the ball valve manufacturer for the combined equipment consisting of valve and operator.
  - 2. Responsibility of the manufacturer extends to proper selection, assembly, factory testing, and furnishing of specified products.

#### PART 2 - PRODUCTS

##### 2.01 MANUFACTURERS

- A. For 3-way ball valves, one of the following or equal:
  - 1. Marwin Series 3T-3700R Series.
- B. For 2-way ball valves, one of the following or equal:
  - 1. Apollo 70-140 Series
- C. Modify equipment as necessary to meet this specification.

##### 2.02 MATERIALS

- A. For 3-way ball valves:
  - 1. Body and Cap: ASTM A351, stainless steel Type 316.
  - 2. Ball: ASTM A351, stainless steel, Type 316.
  - 3. Shaft: ASTM A351, stainless steel, Type 316.
  - 4. Trim Material: Type 316 stainless steel.
  - 5. Body Seal: RPTFE

6. Seat: PTFE
  7. Body Bolt and Tie Rod: ASTM A193, Grade B8.
  8. Handle: ASTM A351, stainless steel, Type 340.
- B. For 2-way ball valves:
1. Body and Cap: B584-C84400, Bronze
  2. Ball and Stem: ASTM A351, stainless steel, Type 316.
  3. Body Seal: RPTFE
  4. Seat: RPTFE
  5. Handle: ASTM A351, stainless steel, Type 340.

### 2.03 COMPONENTS

- A. Ball Valves
1. 3-way ball valves shall be T-port ball valves with threaded ends.
  2. 2-way ball valve shall be full port ball valves with threaded ends.
  3. Suitable for water service at a temperature of 100°F and 800 psi.
  4. For fully closed valves of size 2" and less at a differential pressure of 100 psi, maximum allowable opening torque is 20 ft-lbs of torque to open.
- B. Equip manually-operated valves with handle operators

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Operators shall have their manual operating accessories, where specified, mounted and operable from the floor.

### 3.02 OPERATION

- A. 3-way Ball Valve at Golf Course Service Connection
1. Valve Position 1: Recycled Water Tap to Altitude Valve (Altitude Valve Closed)
  2. Valve Position 2: Tank Outlet to Altitude Valve (Altitude Valve Open)
  3. Valve Position 3: Recycled Water Tap to Tank Outlet (Not Used)

### 3.03 INSTALLATION

- A. Install each valve as shown on the contract drawings and in accordance with manufacturer's printed instructions.

### 3.04 TESTING

- A. After completion of installation, field test each control valve to demonstrate compliance with performance requirements as specified.

**END OF SECTION**

**SECTION 15117**  
**COMBINATION AIR VALVES**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Combination Air Valves (CAV).

1.02 SUBMITTALS

- A. Provide the following, at a minimum:
  - 1. A summary sheet for each type of valve including the size and orifice diameter for each.
  - 2. Product data sheets for each type of valve.
  - 3. Product data sheets for the coating material.

1.03 DEFINITIONS

- A. Combination Air Valve (CAV): Includes a small venting orifice to vent the accumulation of air and other gases with the line or system under pressure, a large venting orifice to permit the release of air as the line is being filled, and vacuum relief as the line is drained or under negative pressure. Includes both single- and dual-body construction.

**PART 2 - PRODUCTS**

2.01 GENERAL

- A. Provide valves with the inlet and orifice sizes indicated. If the orifice sizes are not indicated, propose an orifice size suitable for the proposed operating conditions for each valve as part of the submittal.
- B. Operating pressures: 250 psi. minimum. Provide valves with higher pressure ratings where indicated.

2.02 MATERIALS

- A. Provide air valves of the type and in the location indicated.
- B. Air Valve Materials:
  - 1. Body, cover: Cast iron, ASTM A126, Grade B, or ASTM A8, Class 35
  - 2. Float: Stainless steel, ASTM A240, Type 316
  - 3. Seat: Buna-N or Type 316 stainless steel
  - 4. Lever mechanism: Stainless steel, ASTM A40, Type 316
  - 5. Trim: Stainless steel, ASTM A240, Type 316
- C. Seat washers and gaskets: Designed to provide drop tight shutoff when valves are closed.
- D. Finish: Two-part epoxy minimum 12 mils thick.

## 2.03 COMBINATION AIR VALVES

- A. Combination air valves for water service shall be single-body construction. Combination air valves shall have a small venting orifice to vent the accumulation of air and other gases with the line or system under pressure and shall have a large venting orifice to permit the release of air as the line is filling or relieve the vacuum as the line is draining or is under negative pressure. Valve shall have a three-inch or two-inch inlet and outlet unless otherwise shown and designed to have a small 3/32-inch venting orifice. Body and cover, cast iron; float and trim, stainless steel; seat, Viton or Buna-N.
- B. Air valves for the transmission main shall be installed as shown on plan. Isolation valves shall be provided below each air valve.
- C. One and Two Inch:
  - 1. Type: Single body
  - 2. Inlet/Outlet: NPT
  - 3. Manf./Model:
    - a. APCO 145C
    - b. Valmatic 202C
    - c. Crispen UL10
    - d. Or equal
- D. Three Inch:
  - 1. Type: Single body
  - 2. Inlet/Outlet: Flanged unless otherwise indicated
  - 3. Manf./Model:
    - a. APCO 147C
    - b. Valmatic 203C
    - c. Crispen C Series
    - d. Or equal
- E. Box Enclosure:
  - 1. Box – Christy B36
  - 2. Lid- Christy B36D marked “RECYCLED WATER”
  - 3. Box Extension – Christy B36X12
- F. Pedestal Cabinet: Marconi TV80SB
- G. Suction Screen: Flow Ezy Filters Inc.
- H. Polyethylene Service Pipe
  - 1. Service Pipe: High density polyethylene pipe, class 200, 3408, SDR 9, ASTM D-2737, AWWA C901.
  - 2. Stainless steel insert:
    - a. Ford 52

- b. Jones J2805
- c. McDonald 6133
- d. Mueller 504385

**PART 3 - EXECUTION**

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.02 TESTING

- A. Following installation, test each valve as part of the pipeline the valve is attached to demonstrate the intended operation and zero leakage when closed.

**END OF SECTION**

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**SECTION 15120**  
**ALTITUDE VALVES**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Altitude control valve for recycled water system.

1.02 REFERENCED SECTIONS

- A. None

1.03 SUBMITTALS

- A. Product Data: Provide manufacturer's catalog data, weights, dimensions, and assembly drawings with materials of construction.
- B. O&M Manual: Control Valve manufacturer's Installation, Operation and Maintenance manual.

1.04 QUALITY ASSURANCE

- A. The control valve shall be tested prior to shipment. The standard test shall include a functional stroke test and pressure and leak test of valve body, seat, fitted pilots and accessories.
- B. The control valve shall be covered by a minimum three (3) year warranty against defects in materials and workmanship. The 316 stainless steel seat ring shall be covered by a lifetime guarantee.
- C. All control valve maintenance and repairs shall be possible without removing the main valve body from the line, when installed in accordance with manufacturer's recommendations.

**PART 2 - PRODUCTS**

2.01 ALTITUDE CONTROL VALVE

- A. General Requirements:
  - 1. The valve shall be a non-modulating one-way flow altitude control valve which shall maintain a preset maximum reservoir level.
  - 2. Valve shall be designed to accommodate a sustained flow rate of 450 gallons per minute with an inlet pressure of 33 psi.
- B. Manufacturers: One of the following, or equal:
  - 1. Singer Valve, Model 106-A-2-RW 150F (Recycled Water)
- C. Main Valve Design:
  - 1. The main valve, bonnet and removable stem cap shall be constructed of ASTM A536 (Grade 65/45/12) ductile iron.

2. Main valves of 2.5" (65mm) and larger shall have a removable stem cap for access to the main valve stem for alignment check, spring installation and ease of service and assembly.
3. The main valve bonnet shall be located using two or more locating guide pins to maintain the inner valve assembly alignment and for ease of maintenance.
4. The main valve trim, consisting of seat ring shall be constructed of AISI 316 stainless steel. The valve stem shall have wrench flats for ease of maintenance.
5. The main valve stem shall be constructed of Oxy-Nitrite.
6. The main valve shall provide a drip-tight seal using a mechanically retained EPDM resilient disc, having a rectangular cross section, against the stationary AISI 316 stainless steel seat ring.
7. The stationary AISI 316 stainless steel seat ring of main valves 2.5" (65mm) and larger shall be held in place using Spiralock® self-locking screws and seat ring retainers.
8. All internal and external ferrous components, including all mating surfaces, shall be coated with an NSF-61 approved fusion bonded epoxy to a minimum of 10 mils DFT-Dry Film Thickness.
9. The main valve elastomers: diaphragm, resilient disc and seals, shall be EPDM.
10. All main valve fasteners (bolts, nuts, studs, cap screws) shall be supplied as AISI 18-8 stainless steel. All bonnet bolts shall be fitted with stainless steel washers to prevent damage to the bonnet coating.
11. Yellow metals exposed to the media are not allowed, minimum 303 Stainless Steel shall be used.
12. Valve shall have flanged end connections. Flanged connections shall be specify ANSI/ASME B16.42 Class 150# flange drilled, faced and rated. Threaded connections shall be NPT.
13. Due to the potential for noise, vibration and erosion damage from cavitation, the valve manufacturer shall provide, upon request, a computerized sizing and cavitation analysis, using independent third party software. Cavitation analysis shall provide the status of cavitation based on customer supplied parameters as to valve size, flow rate requirements and pressure conditions. The cavitation analysis shall also provide information as to Cv factor, percent of valve lift, cavitation index and noise level.
14. The valve manufacturer shall be able to supply cavitation control trim which shall be engineered to be optimized to the actual operating parameters of the control valve application and warranted to perform correctly and prevent main valve cavitation damage under the stated conditions. Orifice plates or other non-engineered cavitation control devices shall not be used to prevent or minimize valve cavitation.

D. Pilot Controls:

1. The 3-way altitude control pilot shall be a Singer 301-4 or approved equal, with a spring to adjust the reservoir maximum level setting. The altitude pilot body shall be serviceable without removing the pilot from the valve.
2. The pilot trim, consisting of a replaceable inner valve shall be constructed of AISI 316 stainless steel. The pilot body and diaphragm casing shall be constructed of ASTM A536 ductile iron with fusion bonded epoxy coating.
3. The pilot elastomers: diaphragm and seals shall be of EPDM.
4. The adjustable pilot spring range shall be supplied as 40 to 125 feet (12-38m). The pilot shall be preset at specify 60 feet (18m).
5. The pilot tubing shall be supplied as rigid AISI 316 stainless steel.
6. A closing speed control shall be provided. An adjustable needle valve closing speed control shall be constructed of 316 stainless steel with handle operator.
7. Pilot isolation ball valves shall be supplied as standard. Pilot isolation ball valves shall be constructed of 316 stainless steel with stainless steel handle operator.
8. A pilot strainer shall be supplied as standard. Strainer to be Arion J1521G(M) with a 40-mesh 316 stainless steel screen. The external pilot strainer shall have a removable plug for easy maintenance access to the pilot screen and have provision for installation of a ball valve for pilot screen flushing.
9. The control valve shall be supplied with a Singer Model X107 Position Indicator as standard. The valve position indicator shall provide a visual reference to the main valve open position. The indicator stem rod shall be AISI 316 stainless steel, threaded or pinned to the main valve stem. The indicator rod shall move within a 303 stainless steel hexagonal housing having a clear Pyrex sight glass. A cap and bleed valve shall be provided to purge any air that may become trapped within the main valve bonnet and stem cap.

E. Coating:

1. Coat interior and exterior of valve body and bonnet with fusion bonded epoxy.
  - a. Fusion bonded epoxy: Complying with AWWA C550 and NSF/ANSI 61 approved.
  - b. Exterior of valve shall be powder coated and purple in color.

**PART 3 - EXECUTION**

3.01 INSTALLATION

- A. Install valves in accordance with the manufacturer's recommendations.
- B. Repair damaged areas of epoxy coating in accordance with AWWA C550 such that coating is free of holidays and other defects.

**END OF SECTION**

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**SECTION 15130**  
**BACKFLOW PREVENTER**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Contractor furnished and installed above ground reduced pressure double check valve assembly complete and operable, including check valves, shut off valves, and test ports.

1.02 REFERENCED SECTIONS

- A. Section 01330 – Submittals

1.03 SUBMITTALS

- A. Comply with Section 01330.
- B. Submit detailed dimensions, materials of construction, pressure and temperature ratings.
- C. Submit complete schematics and dimensioned drawings that show the pilot control tubing and devices that will be provided to implement the control features required for each valve.

**PART 2 - PRODUCTS**

2.01 BASIC POTABLE VALVE

- A. Materials of construction for the basic valve shall be as follows and in accordance with AWWA C511. Provide compatible materials to avoid galvanic corrosion between dissimilar metals.
  - 1. Body, cover: Cast iron, ASTM A48, ductile iron, ASTM A536, cast steel, ASTM A216 WCB, cast bronze, ASTM B62, or stainless steel, AISI Type 316
  - 2. Disc: Cast bronze, ASTM B62
  - 3. Seat checks: Stainless steel, ASTM A276, Type 316
  - 4. Spring: Stainless steel, ASTM A276, Type 302
  - 5. Stem: Stainless steel, ASTM A276, Type 316
  - 6. Shutoff valves and test cocks shall be full ported ball valves.
  - 7. Guide bushings: Bronze, ASTM B 584
  - 8. Resilient seat: Buna N
  - 9. Fasteners: Type 316 stainless steel
  - 10. Coating: Fusion bonded epoxy
- B. Valves shall be equipped with stem hand wheel operators and locking chain.
- C. Valves shall be rated for a minimum working pressure of 175 psi.
- D. The assembly shall be reduced pressure backflow assemblies appearing on “List of Approved Backflow Prevention Devices” (latest edition) by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research.

## 2.02 RECYCLED WATER BACKFLOW

- A. Materials of construction for the basic valve shall be as follows and in accordance with AWWA C511. Provide compatible materials to avoid galvanic corrosion between dissimilar metals.
  - 1. Body, cover: Cast iron, ASTM A126 Class B
  - 2. Disc: Cast iron, ASTM A126 Class B
  - 3. Seat checks: Cast iron, ASTM A126 Class B
  - 4. Spring: Stainless steel, ASTM A276, Type 302
  - 5. Stem: Stainless steel, ASTM A276, Type 316
  - 6. Resilient seat: Buna N
  - 7. Fasteners: Type 316 stainless steel
  - 8. Coating: Fusion bonded epoxy, Purple
- B. 3-inch and Larger assemblies: Flanged conforming to ANSI B16.1
- C. Manufactured by Matco Norca model 120F or approved equal.

## **PART 3 - EXECUTION**

### 3.01 INSTALLATION

- A. Installation shall be in accordance with manufacturer's instructions.

### 3.02 TESTING

- A. Following installation, assembly shall be tested by AWWA certified backflow prevention technician to demonstrate operation under actual service conditions.

**END OF SECTION**

**SECTION 15143**  
**DUCTILE IRON PIPE**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Ductile iron pipe, joints, fittings, gaskets, and pipe lining and coating.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
  - 1. Section 02089 – Pipe Polyethylene Protective Sleeves
  - 2. Section 15050 – General Piping
  - 3. Section 15996 – Testing Pressure Piping

1.03 SUBMITTALS

- A. Certifications
  - 1. Manufacturer’s certificates of compliance with the specified standards.
- B. Shop Drawings
  - 1. Detailed layout drawings showing alignment of pipes, location of valves, fittings, and appurtenances, types of joints, connections to structures and joint thrust restraint details.
- C. Product Data
  - 1. Photographs, drawings, and descriptions of fittings, gaskets, couplings, grooving of pipe and fittings, pipe linings, and coatings.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Block piping material for shipment, prevent damage to castings and linings.
- B. Carefully handle piping material during loading, unloading, and installation. Do not drop piping material from cars or trucks. Lower piping material by mechanical means. Do not drop or pound pipe to fit grade.
- C. Repair damaged cement mortar lining to match quality, thickness, and bonding of original lining in accordance with AWWA C104. When lining cannot be repaired or repairs are defective, replace defective piping with undamaged piping.
- D. Protect gaskets and polyethylene encasement from long term exposure to sunlight.
- E. Store fittings and other accessories such that they do not accumulate and hold rainwater, dirt, and debris.

**PART 2 - PRODUCTS**

2.01 DUCTILE IRON PIPE

- A. Type: Conforming to AWWA C150 and AWWA C151 with minimum pressure class 350.

## B. Pipe Joints

### 1. General Intent:

- a. Use push-on type joints on buried pipe unless mechanical joints are specifically indicated on the Drawings.
- b. Use restrained joints on buried piping on fittings that create a change in pipe size and on fittings that result in a change of direction, whether the change is in horizontal plane or a vertical plane.
- c. Use flanged joints on all exposed pipes. Use flanged joints in buried situations only where flanged joints are specifically indicated on the Drawings.
- d. Exposed Piping: To the greatest extent possible, use factory-assembled pipe spools with flanges for exposed piping. Field cutting pipe to match field conditions will be allowed in limited quantities as determined by the Construction Manager.

### 2. Flanged Joints:

- a. Screw-on type with diameter, thickness, bolt holes, and other characteristics conforming to ANSI B16.1.
- b. Material: Ductile iron.
- c. After installation of flanges, machine flange face to make perpendicular to axis of the pipe.
- d. Bolt Holes on Flanges:
- e. 2-holed and aligned at both ends of pipe.
- f. Cap Screw or Stud Bolt Holes: Tapped.
- g. Bolts and Nuts: Conform to ANSI/ASME B16.1.
  - 1) Type 304 or Type 316 stainless steel.
  - 2) Cut and finish bolts to project a maximum of 1/4-inch beyond nut when joints are assembled.

### 3. Grooved Joints:

- a. Joint Design: In accordance with ANSI/AWWA C-606

### 4. Mechanical Joints:

- a. Joint Design: In accordance with AWWA C111/ANSI A21.11.

### 5. Restrained Mechanical Joints:

- a. Design: Lug-type joint.
- b. Bolts: Type 304 Stainless Steel.
- c. Manufacturers: One of the following or equal:
  - 1) Pacific States Cast Iron Pipe Company, Lock Mechanical Joint.
  - 2) American Cast Iron Pipe Company, MJ Coupled Joint.
  - 3) EBBA Iron, Megalug.

### 6. Push-on Joints:

- a. Type: Gasketed type joint suitable for buried service.

- b. Conforming to AWWA C111.
  - c. Manufacturers: One of the following, or equal:
    - 1) Fastite Joint as manufactured by American Cast Iron Pipe Company.
    - 2) Pacific States Cast Iron Pipe Company.
    - 3) Tyton Joint as manufactured by U.S. Pipe.
  - d. Not permitted on fittings or specials, unless otherwise specified.
  - e. Joint Deflection: Provide an allowable deflection up to 5 degrees at specified pressures.
  - f. Make joint assembly and field cut joints per AWWA C600 and manufacturer's recommendations.
7. Restrained Push-on Joints:
- a. Manufacturers: One of the following or equal:
    - 1) United States Pipe and Foundry Company, TR Flex.
    - 2) Pacific States Cast Iron Pipe Company, Thrust Lock.
    - 3) American Cast Iron Pipe Company, Flex Ring or Lok-Ring.
  - b. Design: Suitable for the following working pressures:
    - 1) For 4- through 24-inch Pipe: 350 pounds per square inch gauge.

## 2.02 FITTINGS

- A. Fittings: Ductile iron conforming to AWWA C110 or AWWA C153.
- B. Joint Type: Same as that of the associated piping as specified in Section 15050.
- C. Plain end-to-flanged joint connectors using set screws are not acceptable.

## 2.03 GASKETS

- A. Push-on Joints and Mechanical Joints: Synthetic rubber compound in which the elastomer is nitrile or neoprene and conforming to AWWA C111.
- B. Flanged Joints: Neoprenem, full face..

## 2.04 PIPE LININGS AND COATINGS

- A. Asphaltic Base Coating
  - 1. Apply to outside surface of pipes which will not receive another coating. Apply in accordance with AWWA C151/ANSI A21.51.
- B. Cement-mortar Lining
  - 1. Apply mortar lining in accordance with AWWA C104 to interior surface of pipe unless un-lined pipe is specifically indicated on the Drawings or specified.
  - 2. Apply mortar to clean, bare metal surfaces, extended to faces of flanges, ends of spigots, and shoulders of hubs.
  - 3. Provide double thickness lining per AWWA C104.

## 2.05 DUCTILE IRON PIPE APPURTENANCES

### A. Dismantling Joints

1. Flange Spool: AWWA Class D Steel ring flange. Pipe is ASTM A36 plate.
2. End Ring and Body: ASTM A36 steel.
3. Gaskets: NBR made from rubber compounded for water and sewer service.
4. Bolts and Nuts: Type 304 stainless steel conforming to ASTM A588.
5. Pressure: Rated to 150 psi.
6. Manufacturers: Romac Industries Inc., DJ400 or equal.

### B. Lug-type Restrained Flange Adapters

1. Use lug type restrained flanged adapters when connecting flanged joints on pipe, fittings, or valves to straight pipe that has been cut to length in the field.
2. Material: Ductile iron conforming to ASTM A536.
3. Restraint Mechanism: Consists of multiple gripping wedges designed to maximize restraint capability. Use torque limiting actuating screws to insure proper initial set of gripping wedges. Restrained flange adapters using set screws are not acceptable.
4. The flange adapter shall be capable of deflection during assembly, or permit lengths of pipe to be field cut, to allow a minimum of 0.6" gap between the end of the pipe and the mating flange without affecting the integrity of the seal.
5. Manufacturers: EBAA Iron Inc. Series 2100 Megaflange, or equal.

## 2.06 POLYETHYLENE ENCASEMENT

- A. Conform to Section 02089, Pipe Polyethylene Protective Sleeves.

## **PART 3 - EXECUTION**

### 3.01 INSTALLATION

#### A. General

1. Install ductile iron piping in accordance with AWWA C600, modified as specified in Section 15050.
2. Lay mechanical joint or bell and spigot pipe with 1/8 inch space between the spigot and shoulder of the pockets.

#### B. Polyethylene Encasement

1. Wrap ductile iron pipe to be buried with polyethylene encasement in accordance with ASTM A674 and AWWA C105.
2. Repair tears and make joints with two layers of plastic tape.

### 3.02 FIELD QUALITY CONTROL

- A. Test ductile iron piping as specified in Section 15996.

## **END OF SECTION**

**SECTION 15145**  
**POLYVINYL CHLORIDE (PVC) PRESSURE PIPE (AWWA C900)**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Polyvinyl chloride pipe manufactured in compliance with AWWA C900, sizes 4 inch through 24-inch.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this section:
  - 1. Section 02089 – Polyethylene Protective Sleeves
  - 2. Section 15996 – Testing Pressure Pipe

1.03 SUBMITTALS

- A. Product Data
  - 1. Manufacturer’s product data for all materials proposed for use in the Work.
  - 2. Shop drawings showing detailed layout of pipe spools, spacers, adapters, connectors, fittings and pipe supports not indicated in the Contract Documents.
  - 3. Manufacturer’s technical data and installation instructions.
  - 4. Manufacturer’s certificate of compliance indicating that all materials provided under this Section meet the requirements of the Contract Documents.
- B. Test reports from:
  - 1. Hydrostatic proof testing
  - 2. Sustaining pressure testing
  - 3. Burst strength testing
- C. Warranty

1.04 DEFINITIONS

- A. Field joints: Joints between subsequent pipe pieces (does not include fitting joints).

1.05 PRODUCT, DELIVERY, STORAGE, AND HANDLING

- A. Handling
  - 1. Use wide fabric choker slings.
  - 2. Do not drop pipe or fittings.
  - 3. Do not use hooks.
  - 4. Use extra care when handling and installing PVC pipe during cold weather due to reduced impact resistance.

5. Pipe shall be transported in a vehicle having a bed long enough to provide support for the full length of pipe. The shipping company shall protect the loaded pipe to avoid vehicle exhaust during transit.

B. Storage

1. Store in accordance with the manufacturer's requirements.
2. Store pipe at the job site in unit packages provided by the manufacturer.
3. Avoid compression, damage, or deformation to the pipe bells and barrels.
4. Keep manufactures pipe supports and straps in place until just before installation.
5. When unit packages of flexible pipe are stacked, ensure that weight or upper units do not cause deformation to pipe in lower units.
6. When long-term storage with exposure to direct sunlight is unavoidable, cover flexible pipe with an opaque material while permitting adequate air circulation above and around the pipe as necessary to prevent excessive heat accumulation.
7. Do not store flexible pipe close to heat sources or hot objects such as heaters, boilers, steam lines, engine exhaust, etc.
8. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no water, earth, or other substances will enter the pipe of fittings.
9. Protect gaskets and/or rubber rings from excessive exposure to heat and sunlight.

1.06 INSPECTION

A. Factory Inspection

1. Piping and PVC fittings may be subject to inspection at the place of manufacturer in accordance with the referenced standards at the option of the Engineer.
2. Notify the Engineer 14 calendar days prior to the start of any phase of the pipe manufacture.
3. During manufacture of the pipe, give the Engineer or Engineer's representative access to all areas where manufacturing is in process to make inspections to confirm compliance with the Contract Documents.

1.07 TESTING

- A. Except as modified herein, factory test pipe in compliance with AWWA C900.
- B. Contractor shall pay all expenses incurred for testing or providing samples.

**PART 2 - MATERIALS**

2.01 PIPE

- A. Polyvinyl Chloride (PVC) pressure pipe 4- through 24-inches nominal size:
  1. Conform to AWWA C900, Pressure Class 235 and DR of 18 unless otherwise indicated.

2. Pipe Materials: Manufactured from Class 12454A or 12454B virgin compounds as defined in ASTM D1784.
3. Joint Design: Bell and spigot push-on, O-ring gasket, compression type conforming to ASTM D3139.
4. Gaskets: Elastomeric with solid cross section, conforming to the requirements of ASTM D3139 and ASTM F477.
5. Pipe Lengths: Standard laying length of 20 feet. Shorter pipe lengths may be used in curved alignments to meet manufacturer’s joint deflection limitations.
6. Color: Pantone 522 Purple.
7. Markings: “Caution: Recycled Water – Do Not Drink”. Stamp on opposite sides of pipe every three feet.

## 2.02 FITTINGS

- A. Ductile iron conforming to AWWA C153.
  1. Cement-mortar lined in conformance with AWWA C104.
  2. Minimum working pressure: 350 psi.
  3. Mechanical joint conforming to AWWA C111.
  4. Use flanged fittings where required to connect to flanged valves and other flanged piping components. Conform to the requirements of AWWA C115 for flanged ductile iron pipe and fittings.
  5. Rubber rings for use in couplings and fittings shall conform to the requirements of ASTM F477. Rubber rings shall be clearly labeled with the material type.
  6. Size for dimensions of the pipe being used.
  7. Wrap buried fittings with polyethylene wrap per Section 02089.
- B. PVC:
  1. Polyvinyl Chloride (PVC) conforming to AWWA C900
  2. Pressure class: Match the pipe pressure class or greater.

## 2.03 RESTRAINED JOINTS

- A. Restrain pipe by use of joint restraint devices installed as indicated or as necessary to restrain the pipe joint from coming apart due to internal pressure.
- B. Field joints, 4-inch to 12-inch diameter pipe:
  1. Harness type joint restraint specifically designed for use with the specified pipe.
  2. Description: Two rings that clamp to the pipe which utilize machined teeth to grip the outside surface of the pipe and rods to connect the two rings to restrain the joint.
  3. Design and Materials
    - a. Restrainer Rings: Ductile iron conforming to ASTM A536, split ring with clamping lugs and bolts, serrated on inside face.

- b. Bell Rings: Ductile iron, split, non-serrated ring installed behind and against the pipe ring.
    - c. Restraint rods: Stainless steel per AWWA C111. Use to connect the bell ring and restrainer ring to fully restrain the pipe joint from separation.
    - d. Pressure Rating: 200 psi with a minimum safety factor of 2.
    - e. Coating: Epoxy enamel or fusion bonded epoxy applied in the factory.
  - 4. Manufacturers:
    - a. EBAA Iron, Series 1500.
    - b. Romac Industries, Style 611.
    - c. Or equal.
- C. Thrust Restraint Harness for Flexible Couplings
  - 1. Design
    - a. Split restraint rings manufactured from ductile iron with gripping wedges that are tightened against the exterior surface of the pipe.
    - b. Incorporate tie bars into the harness that span the distance between the restraint rings and provide adequate clearance from the flexible coupling.
    - c. Pressure Rating: 200 psi with a minimum safety factor of 2.
    - d. Coating: Epoxy enamel or fusion bonded epoxy applied in the factory.
  - 2. Manufacturers: One of the following, or equal:
    - a. EBAA Iron, Series 1900.
    - b. Romac Industries, Series 611.
- D. Restrained Joints on Ductile Iron Pipe Fittings and Valves
  - 1. Specifically designed for use with the specified PVC pipe.
  - 2. Designed as a mechanical joint follower gland for ductile iron fittings and valves with mechanical joint ends. Designed with multiple gripping wedges to grip the outside surface of the PVC pipe.
  - 3. Materials
    - a. Gland Body, Wedges and Wedge Actuating Devices: Ductile iron conforming to ASTM A536 steel.
  - 4. Pressure Rating: 200 psi with a minimum safety factor of 2.
  - 5. Manufacturer:
    - a. EBAA Iron, Series 2000PV
    - b. Romac Industries, RomaGrip
    - c. Or equal.
- E. Romac Industries, Series 611.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Install PVC pipe in conformance with the City of Healdsburg Standards and AWWA M23 as modified herein.

### **3.02 INSPECTION**

- A. Promptly remove PVC pipe with any of the following visual defects from the project site:
  - 1. Pipe that is sufficiently out-of-round to prohibit proper joining.
  - 2. Improperly formed ends.
  - 3. Fractured, cracked, chipped, dented, gouged, scratched or otherwise damaged pipe.
  - 4. Pipe that has been damaged during shipment or handling.
  - 5. Discolored Pipe.

### **3.03 PREPARATION**

- A. Straight Pipe Runs: Cut pipe smooth, straight, and at right angles to the pipe axis with saws or pipe cutters designed specifically for the material.
- B. Remove any burrs and dust from the jointing surfaces.
- C. Bevel cut ends in accordance with manufacturer's recommendations.

### **3.04 INSTALLATION**

- A. Prior to making up pipe joints, clean the socket and plain end of the pipe and apply pipe lubrication meeting the requirements of AWWA C111.
- B. Lubricate the entire circumference of the spigot end of the pipe, especially the beveled end. Use lubricant for the pipe gaskets furnished by the pipe manufacturer. No substitutes will be permitted.
- C. Do not lubricate the gasket or the gasket groove in the bell to avoid gasket displacement.
- D. Keep lubricated spigot clean. If sand or dirt adheres to the spigot lubrication, wipe spigot clean and re-lubricate.
- E. Insert the plain end of the pipe into the bell in uniform contact with the gasket. Push the spigot into the bell until the reference mark on the spigot end is flush with the end of the bell. Use a bar or block to assemble the joint. Pullers such as come-along may also be used. Do not use the excavation equipment to assemble the pipe joint.
  - 1. If undue resistance to insertion of the spigot is encountered or the reference mark is not reached the flush position, disassemble the joint, check gasket and reposition if necessary, clean the gasket, bell and spigot and repeat the assembly steps.
- F. Keep pipe lengths in proper alignment. Keep pipe lengths straight. Pipe joints may be deflected in accordance with these specifications, or the pipe may be bent per the manufacturer's recommendations to meet alignment or curve radius. However, no pipe segments shall have deflected joints and bent pipe.

- G. Do not disturb previously completed joints during the joining operation.
- H. Close off open ends of pipe when pipe laying is not in progress.

### 3.05 JOINT DEFLECTIONS

- A. Small alignment deflections may be made at the PVC pipe joints or by using ductile iron restrained mechanical joint sleeves or fittings. Deflection of each PVC pipe joint shall be limited to a maximum of 50 percent of the manufacturer's allowable pipe joint deflection.
- B. Small alignment deflections may be made by bending the pipe segments. Pipe bending shall be limited to a maximum of 75 percent of the manufacturer's allowable pipe deflection. To avoid deflecting the joints while achieving curvature, joints shall be braced or backfilled and compacted to keep them stationary.
- C. Allowable ductile iron fitting joint pulls: No more than 50 percent of the manufacturer's allowable joint pull for the size and DR rating of pipe being placed.
- D. Pipe shall not be offset to a degree such that the spigot end of the pipe deflects (touches) against the end of the pipe bell.

### 3.06 DUCTILE IRON FITTINGS

- A. Install ductile iron fittings consistent with the requirements for the pipe installation.
- B. Following installation of fitting:
  - 1. Wrap ductile iron fitting with polyethylene in conformance with Section 02089.
  - 2. Secure polyethylene wrap to PVC pipe on either side of joint with nylon straps.

### 3.07 THRUST RESTRAINT

- A. Install thrust restraint devices in conformance with the manufacture's recommendations.
- B. Tighten bolts on joint restraint device to the torque recommended by the manufacturer.

### 3.08 PIPE LOCATION

- A. Install locator tape over non-metallic pipe and include a metallic substance that can be registered by magnetic field location device.
- B. Install tracer wire on all non-metallic pressurized pipelines.
  - 1. All runs of non-metallic water pipe, including services, shall have a No.10 gauge, solid, soft drawn, copper wire insulated with high molecular weight polyethylene (HMWPE) insulation laid along the top of the pipe to facilitate locating the pipe at a later date. Tracer wire shall be taped to top of pipe every 10 feet. Wire must be a continuous strand.
  - 2. The wire shall be stubbed up inside each valve box or can. Crimpable copper butt splice kits are permitted in valve boxes or cans only.
  - 3. Conduct continuity test on each splice at all locations.
    - a. The Contractor shall retain a third-party specialist to facilitate a continuity test on the tracer wire.
    - b. The Contractor shall submit a certified report by the third-party testing service stating the tracer wire is performing satisfactorily.

- c. All tests must be reviewed and approved by the Engineer and/or Engineer before the work is accepted.
- d. All construction defects must be repaired and retested before final acceptable is made.
- e. All unacceptable tests must be re-performed by the Contractor at no additional cost to the Engineer.

3.09 FIELD QUALITY CONTROL

- A. Pressure test per Section 15996.
- B. When testing is unsuccessful, remove defective pipe or make necessary corrections and re-test.

**END OF SECTION**

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**SECTION 15200**  
**WATER SERVICES**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Furnishing all labor, materials, tools and equipment required to install new recycled water services and related work as shown on the drawings and in accordance with the Specifications.
- B. This section refers to 3" and 4" water services as shown on the drawings.

1.02 REFERENCED SECTIONS

- A. The following Section is referenced in this Section:
  - 1. Section 01330 –Submittals
  - 2. Section 15143 – Ductile Iron Pipe

1.03 SUBMITTALS

- A. Comply with Section 01330.
- B. Submit Shop Drawings and manufacturer's literature for all materials.

**PART 2 - PRODUCTS**

2.01 GENERAL

- A. All materials for service connection installations shall conform to ANSI/AWWA C800 and shall be "lead free" containing not more than 0.25% total lead content by weight.
- B. All parts provided shall be NSF certified per ANSI/NSF Standard 61 for use in potable water service.

2.02 SERVICE SADDLES FOR SERVICES UP TO 1 INCHES

- A. All service saddles for 1" services shall be made of bronze and shall be made to specially fit the contour of the pipe they are to be installed on.
- B. All reducer bushings shall be bronze.
- C. Saddles for ductile-iron shall be brass body with double bronze straps, female iron pipe threads, and shall be A.Y. McDonald Model 3826, Mueller BR 2B, or Ford 202B, per AWWA C800.
- D. Saddles for PVC C900 pipe shall be brass body, single wide bolted brass band, female iron pipe thread outlet, and shall be Ford Model S91, Mueller Series H-13000, or approved equal.

2.03 SERVICE TEES FOR SERVICES 3 INCHES AND LARGER

- A. All 3 inch service connections shall connect to the PVC C900 pipe by a 12"x4" ductile iron tee as shown on the plans.
- B. Each 3 inch service connection includes a 4" gate valve bolted directly to the 12"x4" tee, 4 inch service piping and then a 4 inch x 3 inch reducer located as shown on the plans.

- C. All service piping shall be ductile iron pipe per specification section 15134.

#### 2.04 STOPS

##### A. Corporation Stops

1. Corporation Stops for copper services shall have compression coupling outlets and male iron pipe (I.P.) thread inlets in accordance with ANSI/AWWA C800 Standard for Underground Service Line Valves and Fittings.
2. 1.5" or 2" services: Mueller 300 Series, Ford FB500 Series, or approved equal.
3. Install all corporations with approved saddles listed in Paragraph 2.02.

##### B. Angle Stops

1. Angle Stops shall be installed on all services up to 2-inch.
2. 1.5" or 2" services: Mueller 300 Series, Ford BFA13 Series, or approved equal.
3. All stops shall have "Lock Off" holes.

#### 2.05 WATER SERVICE LINE

- A. 1" Service Lines (Altitude Valve Pressure Sensing Lines): High Density Polyethylene Pipe, Class 200, 3408, SDR 9, ASTM D-2737, AWWA C901.
- B. 3" or 4" service lines: Ductile iron pipe. All restrained pipe.

#### 2.06 WATER METER AND BOX

- A. Water meter box for 1.5" or 2" service: Christy N-36 or Brooks No. 66 with lid stamped "RECYCLED WATER".
- B. Water meter box for 3" or 4" service: Oldcastle B48BOX (Minimum 30"x48") with Oldcastle Lid B48M2 and as shown on drawings.

### **PART 3 - EXECUTION**

#### 3.01 INSTALLATION

- A. Confirm the location of existing water service to be replaced with the Owner's representative in the field prior to start of any excavation.
- B. Install new 1.5" or 2" water service per Standard Drawing No. SD-217 and this specification.
- C. Install new 3" or 4" water service per Standard Drawing No. SD-220 but as modified on the drawings and this specification.
- D. Service tap for 1.5" and 2" services shall be made using suitable tapping machine approved by Owner. Service taps shall not be made near fittings.
- E. Flush each water service prior to installation of the meter and connection to the customer service line.
- F. Wrap buried copper piping with polyethylene as indicated on the Drawings. Provide polyethylene wrap as specified in Section 15143.

**END OF SECTION**

**SECTION 15996**  
**TESTING PRESSURE PIPING**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Hydrostatic pressure pipeline testing.

1.02 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
  - 1. Section 01500 – Construction Facilities and Utilities
  - 2. Section 01999 – Reference Forms
  - 3. Section 15050 – General Piping

1.03 SUBMITTALS

- A. Testing Schedule and Notification of Testing: Submit advance written notice of testing activities a minimum of 48 hours prior to conducting piping tests.
- B. Testing Plan: Submit a written plan that identifies the methods for water procurement, conveyance and disposal.
- C. Completed Pipe Test Record Forms, found in Section 01999.

1.04 TESTING REQUIREMENTS

- A. Furnish personnel, materials, bulkheads, test plugs, restraints, anchors, temporary connections, pumps, pressure gauges and other equipment needed to perform testing.
- B. Recycled Water for Testing
  - 1. Use recycled water for pressure testing pipelines. Obtain water from the source identified in Section 01500.
  - 2. Disposal:
    - a. Minimize disposal of water used for testing pipelines as practical.
    - b. Dispose of water used for testing pipelines into the existing sewer collection system.
- C. Test only those portions of the pipe that have been installed as part of this Contract.
  - 1. Test new pipe sections prior to making final connection to existing piping.
  - 2. Install test plugs or bulkheads to isolate new piping systems.
  - 3. When testing against a valve is indicated or approved by the Engineer, provide a test plate “pancake” to further isolate the new and existing piping.
- D. Sequence
  - 1. Buried Pressure Piping: Except as otherwise indicated, conduct piping pressure test after trench has been backfilled to subgrade and compacted. Piping may be tested before or after final paving, at Contractor’s option.

2. Encased Piping: Test before encasing pipe in concrete.
- E. Failed Tests: Make necessary corrections or remove defective pipe or defective appurtenances. Repeat pressure test until a successful test is achieved.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Test pipelines, appurtenances, valves and fittings in the pipeline system.
- B. Where allowable leakage rates are not specifically indicated, no leakage is allowed.
- C. Perform testing operations in the presence of the Engineer.
- D. No pressure testing on Fridays.
- E. Prior to pressure testing, clean pipeline of debris, construction materials, dirt and other foreign material within the piping system.
- F. Do not test pipelines until thrust restraint devices have been installed. Where concrete thrust blocks are used, do not begin pressure test until concrete has attained an age of at least 7 days unless otherwise approved by the Owner. Pressure test buried pipe after backfill.

### **3.02 FILLING PIPING SYSTEMS WITH WATER**

- A. Place temporary bulkheads in the pipe at the ends of the test section, and then slowly fill the pipeline with recycled water at a rate which does not cause surges or exceed the rate at which the air can be released through the air valves.
- B. Ascertain that test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to, or movement of, the adjacent pipe.
- C. Fill water from the low point of the pipe segment being pressure tested so that the air may be purged from the pipeline more efficiently.
- D. Purge air within the pipeline during the filling operation. Check proper operation of air release valves and air vents during the filling operation to ascertain proper operation and venting of air from the pipeline.
- E. Concrete pipe, cement-mortar lined pipe and other pipe made from water absorbing material:
  1. After the filling operation is complete, allow the filled pipeline to stand under a slight pressure for at least 24 hours to allow air to escape from any air pockets within the pipeline and the pipe lining to absorb water.
  2. Examine bulkheads, valves and connections for leaks during this period. If leaks are found, make corrections before conducting the pressure test.

### 3.03 PRESSURE TESTING EXPOSED PIPING

#### A. Test exposed piping as follows:

1. Fill section of piping under test with water and raise the system pressure to the test pressure specified below.
2. Visually inspect exposed pipe joints, joints at fittings, valves, hydrants, and other piping appurtenances for leaks.
3. Correct leakage as necessary to eliminate the leakage.
4. Duration of Pressure Test: 2 hours.
5. Leakage Allowances: Zero leakage.
6. Correct any visible leakage by tightening flanges and screwed joints, replacing gaskets or removing defective materials.
7. Repeat test until no leakage is observed.
8. Record results of pressure test on Pipe Test Record form, included in Section 01999.

### 3.04 PRESSURE TESTING BURIED PIPING

#### A. Pressure test buried piping as follows:

1. Fill section of piping under test with water and raise the system pressure to the test pressure specified below.
2. Visually inspect exposed pipe joints, joints at fittings, valves, hydrants, and other piping appurtenances for leaks.
3. Correct visible leaks necessary to eliminate the leakage.
4. The maximum test section shall be 3,500 feet. Test bulkheads shall be provided where the distance between valves exceed this limit.
5. Duration of Pressure Test: 2 hours.
6. The test pressure for hydrostatic testing shall be 150 psi. Test pressure readings shall be taken at the lowest point in the section of pipe being tested.
7. Leakage Measurement:
  - a. Begin test once visible leaks have been eliminated.
  - b. Maintain test pressure during the test period by adding makeup water to a calibrated test reservoir.
  - c. Accurately measure the volume of makeup water introduced into the pipeline to maintain the test pressure to determine the leakage rate for the test.
8. The pipeline pressure test is successful when the makeup water added during the test is equal to or less than the allowable leakage rate (L) defined below.

9. Gasketed Ductile Iron Pipe (mechanical or push-on joint)

$$L = \frac{SD(P)^{1/2}}{148,000}$$

L = Allowable leakage in gallons per hour.

S = Length of the test section in feet.

D = Nominal diameter of the piping in inches.

P = Test pressure in pounds per square inch gauge.

10. Steel Pipe (AWWA C200, Concrete Bar Wrapped Cylinder Pipe (AWWA C303)

a. Gasketed joints:

1) L = 6.25 gallons/inch diameter/mile/24 hours

2) L = allowable makeup water in gallons.

b. Welded joints: No leakage allowed.

c. Where pipeline consists of a combination of welded and gasketed joints, adjust the formula above by the ratio of the joint types over the test section.

11. Polyvinyl Chloride (PCV) pipe:

$$L = \frac{ND(P)^{1/2}}{7,400}$$

L = Allowable leakage in gallons per hour.

N = Number of joints in the length of pipeline to be tested.

D = Nominal diameter of the piping in inches.

P = Test pressure in pounds per square inch gauge.

**END OF SECTION**