MCSD Central Avenue Water & Sewer Rehabilitation Project

Contract Documents and Technical Specifications

November 2022

www.ghd.com

GHD Inc: 12560439

McKinleyville Community Services District

Central Avenue Water & Sewer Rehabilitation Project

November 2022

Prepared for

McKinleyville Community Services District
P.O. Box 2037
1656 Sutter Road
McKinleyville, California 95519

BOARD OF DIRECTORS

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TABLE OF CONTENTS

Page

Advertisement for Bids AD-1

PART 1 – BID REQUIREMENTS

Information for Bidders 1-1
Bidders' Checklist 1-7
Bid Proposal 1-9
Bid Schedule 1-10
Subcontractor Details 1-15
Bid Bond 1-16
Noncollusion Affidavit 1-18
Contractor's Certification for Worker's Compensation Insurance 1-19
Anti-Lobbying Certification 1-20

PART 2 – CONTRACT FORMS

Contract Agreement 2-1
Performance Bond 2-3
Payment Bond 2-5
Notice of Award 2-7
Notice to Proceed 2-8

PART 3 – GENERAL CONDITIONS

General Conditions 3-1

PART 4 – SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS

Section 01 11 00 – Summary of Work
Section 01 20 00 – Measurement and Payment
Section 01 30 00 – Administrative Requirements
Section 01 33 00 – Submittal Procedures
Section 01 40 00 – Quality Requirements
Section 01 50 00 – Temporary Facilities and Controls
Section 01 55 26 – Temporary Traffic Control Systems
Section 01 55 60 – Temporary Sewage Bypass Pumping System
Section 01 57 13 – Erosion Control
Section 01 57 19 – Environmental Requirements
Section 01 60 00 – Product Requirements
Section 01 70 00 – Execution Requirements
Section 01 74 00 – Site Area and Cleanup

DIVISION 2 – EXISTING CONDITIONS

Section 02 00 10 – Site Conditions
Section 02 00 30 – Existing Utilities and Underground Structures

DIVISION 31 – EARTHWORK

Section 31 05 13 – Soils for Earthwork

Section 31 05 16 – Aggregates for Earthwork
Section 31 10 00 – Site Clearing
Section 31 23 16 – Excavation
Section 31 23 19 – Dewatering
Section 31 23 30 – Shoring and Trench Safety
Section 31 23 33 – Trenching and Backfilling

DIVISION 32 – EXTERIOR IMPROVEMENTS

Section 32 11 23 – Aggregate Base Courses
Section 32 12 16 – Asphalt Paving

DIVISION 33 – UTILITIES

Section 33 01 10 – Disinfection of Water Utility Distribution Piping
Section 33 01 30 – Sewer Cleaning
Section 33 01 31 – CCTV Inspection of Existing and Rehabilitated Sewers
Section 33 01 32 – Cured-in-Place Pipe (CIPP) Lining
Section 33 01 33 – Manhole Rehabilitation
Section 33 14 00 – Water Piping Systems
Section 33 14 19 – Valves and Appurtenances
Section 33 14 20 – Fire Hydrants
Section 33 31 00 – Sanitary Utility Sewerage Piping

PART 5 – DRAWINGS

PART 6 – APPENDICES

Appendix A – Geotechnical Report, MCSD Central Ave Water and Sewer Mains, Crawford & Associates, Inc., March 24, 2022

Appendix B – Draft Humboldt County Encroachment Permit

PART 7 – JANUARY 2022 Sewer Main CCTV FOOTAGE

https://www.mckinleyvillecsd.com/bids-and-rfps

ADVERTISEMENT FOR BIDS

McKinleyville Community Services District
Owner

P.O. Box 2037 1656 Sutter Road
McKinleyville, CA 95519
Address

Separate sealed bids will be received for the McKinleyville Community Services District Central Avenue Water & Sewer Rehabilitation Project.

A conditional or qualified bid will not be accepted if it modifies the Plans or Specifications or method of work.

A non-mandatory pre-bid meeting will be held to familiarize potential bidders with the project and is scheduled for 10:00 a.m., December 14th, at the McKinleyville Community Services District Office, 1656 Sutter Road, McKinleyville, California.

The work for this project generally includes, but is not limited to, furnishing all labor, materials, equipment, and supervision required for installation of cured-in-place pipe lining for approximately 2,015 LF of 8-inch AC sewer main, 700 LF of 6-inch AC sewer main, and 4-inch sewer laterals; rehabilitation of manholes; and construction of 2,240 LF of 16-inch PVC water main, 333 LF of 10-inch PVC water main, and 245 LF of 8-inch PVC water main with all service connections, fittings, valves, paving, and other items of work as shown on the Plans.

The engineer's opinion of probable cost for construction of the project is $2.9 million.

Contractors shall submit Qualifications Statements as a part of their bid that meet the requirements outlined in the following sections of the Contract Documents: Section 1.3.A of Specification 33 01 31 (CCTV Inspection of Sewers); Section 1.5.A of Specification 33 01 32 (Cured-in-Place Pipe Lining); and Section 1.6.A of Specification 33 01 33 (Manhole Rehabilitation).

Bids will be received by the General Manager of the McKinleyville Community Services District at the District office, 1656 Sutter Road, McKinleyville, California, 95519 until January 18th at 2:00 p.m., and then at said office publicly opened and read aloud. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to the Owner at McKinleyville Community Services District, PO Box 2037, McKinleyville, CA 95519 and must be delivered to the District office by the above referenced time and date.

The Contract Documents are available and may be examined at the following locations:

MCSD web site: http://mckinleyvillecsd.com/
Humboldt Builders Exchange, Eureka
Shasta Builders Exchange, Redding
Sacramento Builders Exchange, Sacramento
North Coast Builders Exchange, Santa Rosa

Contractors may obtain an electronic copy of the Contract Documents from GHD Inc. for free by emailing a request to Malia Gonzales (malia.gonzales@ghd.com).

Each proposal must be submitted on the prescribed form and accompanied by a certified check or Bid Bond in an amount of not less than 10 percent of the bid amount. Successful bidders will be required to furnish both a Payment Bond and Performance Bond in the full amount of the Contract Price upon receipt of the Notice of Award. In accordance with Public Contract Code Section 10263, the Contractor will be allowed to substitute securities for monies normally withheld by the Owner to insure performance under

this contract.

California State prevailing wage rates will be required on this project. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations, State of California. The general prevailing wage rates applicable to the work are set by the Director of the Department of Industrial Relations.

The District requires that all contractors and subcontractors working on this project keep certified payroll records in accordance with Labor Code 1776 and submit copies to the District. All contractors and subcontractors must also furnish electronic certified payroll records directly to the Labor Commissioner (Division of Labor Standards Enforcement).

It shall be mandatory upon the contractor herein and upon any subcontractors to pay not less than the said specified rates to all laborers, workers and mechanics employed by them in the execution of the Agreement pursuant to CA Labor Code 1774. The Contractor will be required to comply with any changes in these wage rates as they are updated by the State government at no cost to the Owner.

Attention is directed to the provisions in section 1777.5 and sections 1777.6 of the Labor Code concerning the requirement to employ apprentices by the contractor or any subcontractor under it.

Pursuant to Senate Bill 854, all contractors bidding on public works projects must register with the Department of Industrial Relations. Contractors are subject to a registration and annual renewal fee. No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)]. Accordingly, all Prime and Subcontractors contained in a bid must provide valid Department of Industrial Relations registration number(s). Failure to provide valid DIR registration numbers in the bid documents shall disqualify the bid.

David Couch
President
McKinleyville Community Services District

November 15, 2022
Date

PART 1
BID REQUIREMENTS

INFORMATION FOR BIDDERS

Project: Central Avenue Water & Sewer Rehabilitation Project

Bids will be received by McKinleyville Community Services District (herein called the "Owner"), at 1656 Sutter Road, McKinleyville, CA 95519 until the time listed in the Advertisement for Bids, and then at said office publicly opened and read aloud.

Each bid must be submitted in a sealed envelope, addressed to McKinleyville Community Services District, 1656 Sutter Road, P.O. Box 2037, McKinleyville, CA 95519. Each sealed envelope containing a bid must be plainly marked on the outside as BID FOR: Central Avenue Water & Sewer Rehabilitation Project, and the envelope shall bear on the outside the name of the bidder, their address, Contractor's license number, and DIR registration number. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to the Owner at McKinleyville Community Services District, PO Box 2037, McKinleyville, CA 95519.

Bids received by the Owner after the time specified for bid opening will not be considered. The Bidder is solely responsible for timely delivery of their bid.

A non-mandatory, but highly recommended, pre-bid conference/site visit will be held to familiarize potential Bidders with the project. See the Advertisement for Bids for location, date, and time.

It is assumed that by submitting a bid, the Contractor is fully familiar with the existing site conditions and proposed work, and change orders for changed site conditions will not be considered, unless mutually agreed upon by the Owner and Contractor.

All bids must be made on the required bid form. All blank spaces for bid prices must be filled in, in ink or type written, and the bid form must be fully completed and executed when submitted. Only one copy of the bid form is required.

The Owner may waive any informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No Bidder may withdraw a bid within three (3) months after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

Bidders must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and a review of the Specifications including addenda. After bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of Work or of the nature of the Work to be done.

The Contract Documents contain the provisions required for the design and construction of the project. Information obtained from an officer, agent, or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve the Contractor from fulfilling any of the conditions of the Contract.

Each bid must be accompanied by a bid bond payable to the Owner, for ten percent of the total amount of the bid. As soon as the bid prices and firm qualifications have been compared, the Owner will return the bonds of all except the three lowest responsible bidders. When the Agreement is executed, the bonds of the two remaining unsuccessful bidders will be returned. The bid bond of the successful Bidder(s) will be retained until the payment bond and performance bond have been executed and approved, after which it will be returned. A certified check may be used in lieu of a bid bond.

A performance bond and a payment bond, each in the amount of 100 percent of the contract price, with a corporate surety approved by the Owner, will be required for the faithful performance of the Contract.

Attorneys-in-fact who sign bid bonds or payment bonds and performance bonds must file with each bond a certified and effective dated copy of their power of attorney.

The party to whom the Contract is awarded will be required to execute the Agreement and obtain the performance bond, payment bond, and required insurance certificates within twenty-one (21) calendar days from the date when Notice of Award is delivered to the Bidder. The Notice of Award shall be accompanied by the necessary Agreement and bond forms. In case of failure of the Bidder to execute the Agreement, the Owner may consider the Bidder in default, in which case the bid bond accompanying the proposal shall become the property of the Owner.

The Owner, within twenty-one (21) calendar days of receipt of an acceptable performance bond, payment bond and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the Bidder may submit a written notice to withdraw the signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

The Notice to Proceed shall be issued within twenty-one (21) calendar days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor.

If the Notice to Proceed has not been issued within the twenty-one (21) day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

The Owner may make such investigations as they deem necessary to determine the ability of the Bidder to perform the Work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the Work contemplated therein.

A conditional or qualified bid will not be accepted if it modifies the Plans or Specifications or method of Work. The intent is to award the entire job (all Schedules thereunder) to such Contractor or Contractors that will result in the lowest overall total cost to the Owner.

Awards will be made to the lowest responsive, responsible, qualified Bidder(s). The lowest bid will be evaluated based on the total cost provided in the Base Bid Schedule.

All applicable laws, ordinances, rules, and regulations of all Federal, State and local authorities having jurisdiction over construction of the project shall apply to the Contract throughout.

The Bidder shall supply the names, addresses, and valid Department of Industrial Relations (DIR) registration numbers of major subcontractors, material suppliers (greater than 10% of total contract document) and/or fabricators with the bid.

The Contract Documents under which it is proposed to execute the Work consist of the Contract, Plans and Specifications and all material bound herewith as well as any addenda issued as part of the bid process and any change orders or field work directives issued as part of the Work. These Contract Documents are intended to be mutually cooperative and to provide all details reasonably required for the execution of the proposed Work. Any person contemplating the submission of a Bid shall have thoroughly examined all of the various parts of these Documents, and should there be any doubt as to the meaning or intent of said Contract Documents, the Bidder shall request of the Owner, in writing at least six (6) working days prior to bid opening, an interpretation thereof. Any interpretation or change in said Contract Documents will be made only in writing, in the form of addenda to the Documents and will be furnished to all Bidders receiving a set of the Documents, issued no later than 72 hours prior to bid opening, who shall submit, or indicate receipt of all addenda with their proposals. The Owner will not be responsible for any

other explanation or interpretations of said Documents.

Questions regarding the Plans and Specifications shall be submitted in writing to Engineer: Nathan Stevens at nathan.stevens@ghd.com, with a copy to Malia Gonzales at malia.gonzales@ghd.com. Replies to such inquiries will be in the form of addenda or clarifications that will be sent to all plan holders.

Copies of Contract Plans and Specifications may be obtained as specified in the Advertisement for Bids.

The Contract Documents are assembled, arranged, and titled generally in conformance with the 48-division format suggested by the Construction Specifications Institute (CSI). Minor variations to the CSI format may be used herein to suit Owner requirements or to better adapt the Documents to particular types of projects.

Portions of these Contract Documents may contain standard preprinted material. The Bidder's attention is called to the General Conditions of the Contract, which may modify and add to the preprinted material contained herein. Sentences in the Contract Documents which are phrased in mandatory language, but which include no explicit reference to the party who has responsibility for performing the mandated duty, shall be interpreted as imposing responsibility for performance of the duty described on the Contractor. For example, a directive that “the site shall be kept clean” would impose the duty of keeping the site clean on the Contractor.

Each proposal must be submitted on the prescribed form and be accompanied by a certified check or Bid Bond in an amount of not less than 10 percent of the amount bid. Successful bidders will be required to furnish both a Payment Bond and Performance Bond in the full amount of the Contract Price. In accordance with Public Contract Code Section 10263, the Contractor will be allowed to substitute securities for monies normally withheld by the owner to insure performance under this contract.

Where the Bid Proposal is to be submitted on a unit price basis, unit prices will be accepted on all items of Work set forth in the Bid, except those designated to be paid for as a lump sum. The estimate of quantities of Work to be done is tabulated in the Bid and, although stated with as much accuracy as possible, is approximate only and is assumed solely for the basis of calculation upon which the award of Contract shall be made. Payment to the Contractor will be made on the measurement of the Work actually performed by the Contractor as specified in the Contract Documents. The Owner reserves the right to increase or diminish the amount of any class of Work as may be deemed necessary.

When the Bid Proposal is to be submitted on a lump sum basis, a single lump sum price shall be submitted in the appropriate place. The total amount to be paid the Contractor shall be the amount of the lump sum in the Bid, as adjusted for additions or deletions resulting from changes in construction. After award of Contract, the Contractor may be required to break down the lump sum Bid into unit prices for the various portions to be completed.

All blank spaces in the Bid form must be filled in, in ink, in both words and figures where required. No changes shall be made in the phraseology of the forms. Written amounts shall govern in cases of discrepancy between the amounts stated in writing and the amounts stated in figures. In case of discrepancy between unit prices and totals, unit prices will prevail.

Any Bid Proposal shall be deemed informal which contains omissions, erasures, alterations, or additions of any kind, or prices uncalled for, or in which any of the prices are obviously unbalanced, or which in any manner shall fail to conform to the conditions of the published Advertisement for Bids and associated Contract Documents.

The Bidder shall sign the Bid Proposal in the blank space provided therefor. If Bidder is a corporation, the legal name of the corporation shall be set forth above, together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. Bid proposals signed by a non-corporate officer shall be invalid. If Bidder is a co-partnership, the true name of the firm shall be set forth above, together with the signature of the general partner or general partners authorized to sign contracts on behalf of the

co-partnership. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be on file with the Owner prior to opening of Proposals or submitted with the Proposal, otherwise the Proposal will be regarded as not properly authorized.

State and local sales and use taxes, as required by the laws and statutes of the State and its political subdivisions, shall be paid by the Contractor. Prices quoted in the Proposal shall include sales tax unless provision is made in the Bid Proposal form to separately itemize the tax.

Any Bidder may modify their bid by telegraphic or written communication at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the Owner prior to the closing time. The telegraphic or written communication should not reveal the bid price but should state the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened.

Each Bidder must inform themselves of the conditions relating to the execution of the Work, and it is assumed that Bidders will inspect the site, site access limitations, existing electrical and communications infrastructure and capacity, historical energy use and facility load requirements, and make themselves thoroughly familiar with all the Contract Documents. Failure to do so will not relieve the successful Bidder of the obligation to enter into a Contract and complete the contemplated Work in strict accordance with the Contract Documents. The Bidder's attention is called to the General Conditions of the Contract Documents with regard to the Bidder's obligation to verify for themselves and to their complete satisfaction all information concerning site and contract conditions, and Notice requirements.

No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) or be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the State of California Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].This project is subject to compliance monitoring and enforcement by the State of California Department of Industrial Relations. Accordingly, all Prime and Subcontractors contained in a bid must provide valid Department of Industrial Relations registration number(s). Failure to provide valid DIR registration numbers in the bid documents shall disqualify the bid.

The successful bidder and its Subcontractor(s) must possess the California contractor’s license(s) in the classification(s) required by law to perform the Work.

Any bid protest must be in writing and received by the Owner, at 1656 Sutter Road, McKinleyville, CA 95519 before 5:00 p.m. no later than three working days following bid opening (the “Bid Protest Deadline”) and must comply with the following requirements:

Only a bidder who has actually submitted a Bid Proposal is eligible to submit a bid protest against another bidder. Subcontractors are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder but must timely pursue its own protest. If required by Owner, the protesting bidder must submit a nonrefundable fee in the amount specified by Owner, based upon Owner’s reasonable costs to administer the bid protest. Any such fee must be submitted to Owner no later than the Bid Protest Deadline, unless otherwise specified.

The bid protest must contain a complete statement of the basis for the protest and all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the person representing the protesting bidder.

A copy of the protest and all supporting documents must be concurrently transmitted by email, by or before the Bid Protest Deadline, to the protested bidder and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

The protested bidder may submit a written response to the protest, provided the response is received by Owner before 5:00 p.m., within three working days after the Bid Protest Deadline or after actual receipt of the bid protest, whichever is sooner (the “Response Deadline”). The response must include all supporting documentation. Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person representing the protested bidder.

A copy of the response and all supporting documents must be concurrently transmitted by fax or by email, by or before the Response Deadline, to the protesting bidder and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

The procedure and time limits set forth in this section are mandatory and are the bidder’s sole and exclusive remedy in the event of bid protest. A bidder’s failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.

Owner reserves the right to award the Contract to the bidder it has determined to be the responsible qualified bidder submitting a proposal that demonstrates the best value based on the sole findings of the District, and to issue a notice to proceed with the Work notwithstanding any pending or continuing challenge to its determination.

California State prevailing wage rates will be required on this project. The general prevailing wage rates applicable to this work are set by the Director of the Department of Industrial Relations. The Contractor will be required to comply with any changes in these wage rates as they are updated by the State government at no cost to the Owner.

All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (Division of Labor Standards Enforcement), electronic Certified Payroll Reporting (eCPR) at the DIR, and also directly submit certified payroll and supporting documents to the McKinleyville Community Services District (pkaspari@mckinleyvillecsd.com) and Engineer (Malia.Gonzales@ghd.com).

During the performance of this contract, the contractor agrees as follows:

(a) The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

(b) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

(c) The contractor will send to each labor union or representative of workers with which he or she has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his or her books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The contractor will include the provisions of Paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of Sept. 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

Bidders shall inform themselves of, and the Bidder awarded a Contract shall comply with, Federal, State and local laws, statutes, and ordinances relative to the execution of the Work. This requirement includes but is not limited to applicable regulations concerning employment of labor, protection of public and employee safety and health, environmental protection, the protection of natural resources, fire protection, burning and non-burning requirements, permits, fees, and similar subjects.

BIDDERS' CHECKLIST

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

ITEM		PAGE	CHECKED
1.	Bid Proposal	1-9 through 1-14	_____
2.	List of Subcontractors (Subcontractor Details)	1-15	_____
3.	Bid Bond	1-16 through 1-17	_____
4.	Authority to Sign Bid Proposal (if applicable)	(Attached to Bid Bond)	_____
5.	Power of Attorney	(Attached to Bid Bond)	_____
6.	Non-Collusion Affidavit	1-18	_____
7.	Workers Compensation Certification	1-19	_____
8.	Anti-Lobbying Certification	1-20	_____
9.	Qualifications Statement that meets the requirements described in Section 1.3.A of Specification 33 01 31 (CCTV Inspection of Sewers).	(Attached to Bid)	_____
10.	Qualifications Statement that meets the requirements described in Section 1.5.A of Specification 33 01 32 (Cured-in-Place Pipe Lining).	(Attached to Bid)	_____
11.	Qualifications Statement that meets the requirements described in Section 1.6.A of Specification 33 01 33 (Manhole Rehabilitation).	(Attached to Bid)	_____

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BID PROPOSAL

Proposal of _____
(hereinafter called "Bidder"), organized and existing under the laws of the State of California,

doing business as _____*.

To the McKinleyville Community Services District, (hereinafter called "Owner").

In compliance with your Advertisement for Bids, Bidder hereby proposes to perform all Work for the Central Avenue Water & Sewer Rehabilitation Project in strict accordance with the Contract Documents, within the time set forth therein, and at the prices stated below.

In the event of a difference between a price quoted in words and a price quoted in figures for the same quotation, the words shall be the amount bid. In the event that the product of a unit price and an estimated quantity does not equal the extended amount quoted, the unit price shall govern and the corrected product of the unit price and the estimated quantity shall be deemed to be the amount bid. If the sum of two or more items in a bidding schedule does not equal the total amounts quoted, the individual items amounts shall govern and the corrected total shall be deemed to be the amount bid.

By submission of this bid, each Bidder certifies, and in the case of a joint bid, each party certifies as to its own organization, that the bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this bid with any other Bidder or with any competitor.

Bidder hereby agrees to commence Work under this Contract on or before a date to be specified in the Notice to Proceed and to fully complete the project and pay the liquidated damages as provided in Articles III and IV of the General Conditions.

*Insert "a corporation," "a partnership," or "an individual" as applicable.

Bidder agrees to perform all the Work described in the Contract Documents for the following prices. Bidder is advised to carefully review all sections of the Contract Documents to completely understand the Work and all constraints, including the schedule and material requirements.

The work for this project generally includes, but is not limited to, miscellaneous demolition; rehabilitation of the existing operating sewer main, laterals, and manholes; temporary bypass pumping; installation of a new water main including all associated piping, valves, appurtenances, and connections to existing waterlines; potholing, construction staking, trenching, shoring, sheeting, and bracing, excavation, grading, installation of subgrade material, tack coat, placement and compaction of asphalt, traffic control, stockpiling, cleanup, and all other Work required to complete the modifications as shown in the Contract Drawings and described in the Specifications.

The following tables have been provided for the Bidder's convenience to assist Bidder in quantifying the major components of the Work and shall in no way be interpreted to be comprehensive. The bid shall be comprehensive and shall include all work associated with the project, including all necessary labor, materials, equipment, supervision, sales tax, and all other applicable taxes and fees.

General Bid Schedule:

BASE BID SCHEDULE					
Item No.	Description	Unit	Qt.	Unit Cost	Total Cost
1.	Mobilization/Demobilization	LS	1	$_____	$_____
2.	Traffic Control	LS	1	$_____	$_____
3.	Sediment and Erosion Control including Revegetating Disturbed areas	LS	1	$_____	$_____
4.	Removal and Disposal of Asbestos Cement Pipe	LS	1	$_____	$_____

GENERAL SUBTOTAL ($_____)

GENERAL SUBTOTAL IN WORDS:_____

Water Bid Schedule:

BASE BID SCHEDULE					
5.	Dewatering System / Water Control	LS	1	$_____	$_____
6.	2" Waterline Modifications	LS	1	$_____	$_____

BASE BID SCHEDULE					
7.	6” PVC Water Pipe and Fittings (near Station 14+55)	LS	1	$_____	$_____
8.	8” PVC Water Pipe and Fittings for Water Line 2.0 (Heartwood Drive)	LF	245	$_____	$_____
9.	10” PVC Water Pipe and Fittings for Water Line 3.0 (Nursery Way)	LF	333	$_____	$_____
10.	16” PVC Water Pipe and Fittings	LF	2,240	$_____	$_____
11.	6” Water Gate Valves	EA	9	$_____	$_____
12.	8” Water Gate Valves	EA	3	$_____	$_____
13.	10” Water Gate Valves	EA	1	$_____	$_____
14.	12” Water Gave Valves	EA	1	$_____	$_____
15.	16” Water Butterfly Valves	EA	7	$_____	$_____
16.	18” Water Butterfly Valves	EA	2	$_____	$_____
17.	Connection Assembly at Station 27+52 (near BMW)	LS	1	$_____	$_____
18.	Connection Assembly near Station 29+53	LS	1	$_____	$_____
19.	Connection Assembly at Sutter Road	LS	1	$_____	$_____
20.	Connection Assembly at Central Ave and Heartwood Drive to East	LS	1	$_____	$_____
21.	Connection Assembly at Heartwood Drive at West End of Water Line 2.0	LS	1	$_____	$_____
22.	Connection Assembly at Holly Drive	LS	1	$_____	$_____

BASE BID SCHEDULE					
23.	Connection Assemblies at Hiller Road	LS	1	$_____	$_____
24.	1" Water Service Lines	EA	10	$_____	$_____
25.	Multi-Meter Water Service Lines	EA	11	$_____	$_____
26.	Fire Hydrant Services	EA	6	$_____	$_____
27.	Combination Air Valve Assembly (Including Precast Vault)	EA	1	$_____	$_____

WATER SUBTOTAL ($_____)

WATER SUBTOTAL IN WORDS:_____

Sewer Bid Schedule:

BASE BID SCHEDULE					
28.	Temporary Sewer Bypass Pumping	LS	1	$_____	$_____
29.	Pre-Rehabilitation Closed-Circuit Television (CCTV) Inspection and Pipe Cleaning – Sewer Mains	LS	1	$_____	$_____
30.	Pre-Rehabilitation Closed-Circuit Television (CCTV) Inspection and Pipe Cleaning – Sewer Service Laterals	EA	24	$_____	$_____
31.	Set up for Sewer Main Open Cut Section Repairs	EA	5	$_____	$_____
32.	Sewer Main Open Cut Section Repairs	LF	50	$_____	$_____
33.	Set up for Sewer Service Lateral Open Cut Replacement	EA	5	$_____	$_____
34.	Sewer Service Lateral Open Cut Replacement	LF	150	$_____	$_____

BASE BID SCHEDULE					
35.	Set Up for Chemical Grout Injection into Pipe Cracks	EA	2	$_____	$_____
36.	Chemical Grout Injection into Pipe Cracks	GAL	20	$_____	$_____
37.	Set up for Rehabilitation of 4" Sewer Laterals Using Cured-in-Place Pipe Lining Method	EA	24	$_____	$_____
38.	Rehabilitation of 4" Sewer Laterals Using Cured-in-Place Pipe Lining Method	LF	660	$_____	$_____
39.	Rehabilitation of 6" Sewer Main Using Cured-in-Place Pipe Lining Method	LF	700	$_____	$_____
40.	Rehabilitation of 8" Sewer Main Using Cured-in-Place Pipe Lining Method	LF	2,015	$_____	$_____
41.	Rehabilitation of Sewer Manholes	EA	9	$_____	$_____
42.	Post-Rehabilitation Closed-Circuit Television (CCTV) Inspection and Pipe Cleaning – Sewer Mains	LS	1	$_____	$_____
43.	Post-Rehabilitation Closed-Circuit Television (CCTV) Inspection and Pipe Cleaning – Sewer Service Laterals	EA	24	$_____	$_____

SEWER SUBTOTAL ($_____)

SEWER SUBTOTAL IN WORDS:_____

The total base bid price below is the sum of the General Subtotal, Water Subtotal, and Sewer Subtotal.

TOTAL OF BASE BID ($_____)

TOTAL OF BASE BID IN WORDS:_____

The low bidder shall be determined based on the Total of Base Bid.

Receipt of the following Addenda is acknowledged:

_____

_____

_____

The representations made herein are made under penalty of perjury.

Respectfully submitted:

Signature	Title
License Number	Date
License Expiration Date	
DIR Registration Number	

(SEAL - If Bid is by Corporation)

SUBCONTRACTOR DETAILS

The Bidder certifies that:

A. __ I do not intend to subcontract any Work on this project.

B. __ I do intend to subcontract portions of the Work on this project.

NOTE: The Bidder shall check box A or box B. If the Bidder does not check a box, it will be deemed that Bidder has checked box A.

If awarded the Contract, the Bidder proposes to employ the following subcontractors who will perform Work or labor or render service to the Bidder in or about the Work in an amount in excess of one-half of one percent (0.5%) of the total amount of Bidder's proposal. If no subcontract Work is proposed, except within the one-half of one percent (0.5%) limit set forth, the Bidder shall so state.

NAME & ADDRESS OF SUBCONTRACTOR	DESCRIPTION OF WORK TO BE SUBCONTRACTED	SUBCONTRACTOR'S CALIF. LIC. NO. AND DIR NO.

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned,

_____ as Principal, and

_____ , as Surety, are hereby held and firmly bound unto

McKinleyville Community Services District, as Owner, in the penal sum of _____for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed this ____ day of _____, 20____.

The Condition of the above obligation is such that whereas the Principal has submitted to _____ a certain bid, attached hereto and hereby made a part hereof to enter into a contract in writing, for the:

Central Avenue Water & Sewer Rehabilitation Project

NOW, THEREFORE,

(a) If said bid shall be rejected, or

(b) If said bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid), and shall furnish a bond for the faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

SEAL:

_____
Principal

By: _____

Title: _____

_____
Surety

By: _____
Title

IMPORTANT - Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

NOTE: Bidder shall provide current “Power of Attorney” for Attorney-in-fact who signs Bid Bond.

NONCOLLUSION AFFIDAVIT

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

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.

This declaration is intended to comply with California Public Contract Code Section 7106 and Title 23 U.S.C Section 112.

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

s/_____

_____
Name and Title [print]

CONTRACTOR'S CERTIFICATION REGARDING WORKERS' COMPENSATION INSURANCE

State of California

County of _____

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

_____
(Name of Contractor)

by:_____

_____
(Signature of Contractor)

Date: _____

ANTI-LOBBYING CERTIFICATION

The contractor certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in conformance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code.

The contractor also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts that exceed $100,000 and that all such subrecipients shall certify and disclose accordingly.

Notes: Providing false information may result in criminal prosecution or administrative sanctions. The above certification is part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Certification.

PART 2
CONTRACT FORMS

CONTRACT AGREEMENT

THIS AGREEMENT, MADE THIS _____ DAY OF _____, 20___, by and

between the *McKinleyville Community Services District*, hereinafter called "Owner," and

_____,

doing business as _____, hereinafter called “Contractor”
(insert "a corporation," "a partnership," or "an individual" as applicable).

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The Contractor will commence and complete the:
   Central Avenue Water & Sewer Rehabilitation Project

2. The Contractor will furnish all the materials, supplies, tools, equipment, labor and other services necessary for the construction and completion of the project described herein.

3. The Contractor will commence the Work required by the Contract Documents within _____21_____ calendar days after the date of the Notice to Proceed and will complete the same within the time provided in Section B-35 of the General Conditions, unless the period for completion is extended otherwise by the Contract Documents.

4. The Contractor agrees to perform all of the Work described in the Contract Documents and comply with terms therein for the sum of $_____, or as shown in the Bid Proposal.

5. The Contract Documents consist of the Bid Requirements, Contract Forms, General Conditions, the Specifications, and the Plans, including all modifications thereof incorporated into the documents before their execution, and including all other requirements incorporated by specific reference thereto. These form the Contract.

6. The Owner will pay to the Contractor in the manner and at such times as set forth in the General Conditions such amounts as required by the Contract Documents.

7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in quadruplicate, each of which shall be deemed an original on the date first above written.

_____	_____
Owner	Contractor
Title_____	Title_____
Date_____	Date_____

This page left blank intentionally.

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter
(Corporation, Partnership, or Individual)

called Principal, and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

McKinleyville Community Services District
(Name of Owner)

P.O. Box 2037, 1656 Sutter Road, McKinleyville, CA 95519
(Address of Owner)

hereinafter called Owner, in the penal sum of

_____ Dollars
($_____)
in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain Contract with the Owner, dated _____ day of _____, 20___, a copy of which is hereto attached and made a part hereof for the construction of:

Central Avenue Water & Sewer Rehabilitation Project

NOW, THEREFORE, If the Principal shall well, truly and faithfully perform its duties, all the undertaking, covenants, terms, conditions, and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety and during one year (minimum) guaranty period, and if he shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that 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 of the Specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the

right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in __4__ counterparts, each one of which shall be deemed an original, this _____ day of _____, 20___.

ATTEST:

_____	_____
(Principal) Secretary	Principal
	By_____
	_____
	Address
_____	_____
Witness as to Principal	
_____	
Address	
	_____
	Surety
ATTEST:	
_____	By_____
Witness as to Surety	Attorney-in-Fact
_____	_____
Address	Address
_____	_____

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter
(Corporation, Partnership, or Individual)

called Principal, and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

McKinleyville Community Services District
(Name of Owner)

1656 Sutter Road, McKinleyville, CA 95519
(Address of Owner)

hereinafter called Owner, in the penal sum of

_____ Dollars
($_____)
in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain Contract with the Owner, dated _____ day of _____, 20___, a copy of which is hereto attached and made a part hereof for the construction of:

Central Avenue Water & Sewer Rehabilitation Project

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, Subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in such Contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such Work, and all insurance premiums of said Work, and for all wages and fringe benefits of labor, performed in such Work, whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulated 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 the Specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in __4__ counterparts, each one of which shall be deemed an original, this _____ day of _____, 20___.

ATTEST:

_____	_____
(Principal) Secretary	Principal
	By_____
	_____
	Address
_____	_____
Witness as to Principal	
_____	
Address	
	_____
	Surety
ATTEST:	
_____	By_____
Witness as to Surety	Attorney-in-Fact
_____	_____
Address	Address
_____	_____

NOTE: Date of bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute bond.

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

NOTICE OF AWARD

TO: _____
_____
_____

PROJECT: Central Avenue Water & Sewer Rehabilitation Project

The Owner has considered the bid submitted by you for the above-described work in response to its Advertisement for bids dated _____ and Information for Bidders.

You are hereby notified that your bid has been accepted for items in the amount of

_____ Dollars
($_____)

You are required by the Information for bidders to execute the Agreement and furnish the required Contractor's certificates of insurance within twenty-one (21) calendar days from the date this Notice is received by you.

If you fail to execute said Agreement and to furnish said insurance within twenty-one (21) calendar days from the date of receipt of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your bid as abandoned and as a forfeiture of your bid bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

Dated this _____ day of _____, 20___.

Owner: McKinleyville Community Services District

By: _____ Title: General Manager

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged by:

_____
(Name of Contractor)

Dated this _____ day of _____, 20___.

By: _____ Title: _____

NOTICE TO PROCEED

TO: _____
_____
_____

PROJECT: Central Avenue Water & Sewer Rehabilitation Project

You are hereby notified to commence Work in accordance with the Agreement on or before the _____ day of _____, 20_____, and you are to complete the Work within the time provided in Section B-35 of the General Conditions.

The date of completion of all Work is therefore _____ day of _____, 20___.

You are required to return an acknowledged copy of this Notice to Proceed to the Owner.

Dated this _____ day of _____, 20___.

Owner: McKinleyville Community Services District

By: _____ Title: General Manager

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged by:

_____
(Name of Contractor)

Dated this _____ day of _____, 20___.

By: _____ Title: _____

PART 3
GENERAL CONDITIONS

GENERAL CONDITIONS
TABLE OF CONTENTS

SECTION A – DEFINITIONS AND TERMS **Page 3-**

A-1 General 1
A-2 Abbreviations 1
A-3 Definitions 2

SECTION B – GENERAL CONDITIONS

ARTICLE I. SCOPE OF WORK 6
B-1 Intent of Contract Documents 6
B-2 Contractor's Understanding 6
B-3 Changes in the Work 7
B-4 Procedures and Allowable Costs on Changes 8
B-5 Unilateral Change in or Addition to the Work 10
B-6 Differing Site Conditions 10
B-7 Claims for Extra Costs 11
B-8 Disputes 12
B-9 Guarantee 12
ARTICLE II. CONTROL OF WORK 14
B-10 Authority of the Engineer 14
B-11 Drawings 14
B-12 Construction Staking and Surveys 16
B-13 Permits and Regulations 16
B-14 Conformity with Contract Documents and Allowable Deviations 16
B-15 Coordination and Interpretation of Contract Documents 16
B-16 Subcontracts 17
B-17 Cooperation of Contractors 17
B-18 Superintendence 18
B-19 Inspection of Work 18
B-20 Tests 20
B-21 Removal of Rejected and Unauthorized Work and Materials 20
B-22 Deductions for Uncorrected Work 20
B-23 Equipment and Plants 21
B-24 Character of Worker 21
B-25 Separate Contracts 21
B-26 Materials, Services and Facilities 22
B-27 Storage of Materials 23
B-28 Trade Names and Alternatives 23
B-29 Certificate of Compliance 24
B-30 Assignment 24
B-31 Use of Completed Portions, Right to Operate Unsatisfactory Equipment or Facilities 24
B-32 Lands for Work, Right-of-Way Construction Roads 25
B-33 District's Right to Audit and Preservation of Records 25
ARTICLE III. PROGRESS AND COMPLETION OF WORK 27
B-34 Progress Schedule 27
B-35 Commencement and Progress of the Work and Time of Completion 27
B-36 Suspension of Work 27
B-37 Termination For Default - Damages For Delay - Timely Extension 28
B-38 Rights of DISTRICT Upon Termination 30
B-39 Failure to Complete the Work in the Time Agreed Upon - Liquidated Damages 30

B-40 Clean-up 31
ARTICLE IV. LEGAL RELATIONS AND RESPONSIBILITY 32
B-41 Compliance with Laws - Permits, Regulations, Taxes 32
B-42 Prevailing Wage 32
B-43 Labor Compliance and Discrimination 33
B-44 Eight-Hour Day Limitation 34
B-45 Compliance with State Requirements for Employment of Apprentices 35
B-46 Underground Utilities 35
B-47 Water Pollution 35
B-48 Payment of Taxes 35
B-49 Permits and Licenses 35
B-50 Patents 35
B-51 Public Convenience 36
B-52 Safety 36
B-53 Protection of Person and Property 38
B-54 Responsibility for Repair of Facilities 39
B-55 Resolution of Construction Claims 39
B-56 DISTRICT's Repair 39
B-57 Antitrust Claim Assignment 39
B-58 Waiver of Right to Rescind For Material Breach 40
B-59 Contractor's License Notice 40
ARTICLE V. INSURANCE AND LIABILITY 41
B-60 Insurance 41
B-61 Indemnity and Litigation Cost 45
B-62 Protection of Work 45
B-63 No Personal Liability 47
ARTICLE VI. MEASUREMENT AND PAYMENT 48
B-64 Measurement of Quantities 48
B-65 Scope of Payment 48
B-66 Progress Estimate 48
B-67 Progress Payments 49
B-68 Liens and Stop Notices 49
B-69 Final Acceptance and Date of Completion 50
B-70 Final Payment 50
B-71 Final Release 50
B-72 Right to Withhold Payments 51
B-73 Waiver of Interest 52
B-74 Satisfaction of Claims and Liens 52

SECTION A
DEFINITIONS AND TERMS

A-1 General

Wherever the following abbreviations and terms, or pronouns in place of them, are used in these Conditions and other Contract Documents of which these Conditions are a part, the intent and meaning shall be interpreted as provided below.

A-2 Abbreviations

The following abbreviations may be used in the Contract Documents:

AA	Aluminum Association
AASHO	American Association of State Highway Officials
ABMA	American Boiler Manufacturer's Association
ACI	The American Concrete Institute
AGA	American Gas Association
AGC	Associated General Contractors
AGMA	American Gear Manufacturer's Association
AI	The Asphalt Institute
AIA	American Institute of Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALSC	American Lumber Standards Committee
ANSI	American National Standards Institute, Inc.
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
CCMTC	California Concrete Masonry Technical Committee
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CRSI	Concrete Reinforcement Steel Institute
CWSRF	Clean Water State Revolving Fund
DFPA	Douglas Fir Plywood Association
DIR	Department of Industrial Relations
ETL	Electrical Testing Laboratory
FEMA	Federal Emergency Management Agency
FS	Federal Specification
HMGP	Hazard Mitigation Grant Program
ICBO	International Conference of Building Officials
IEEE	The Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IPCEA	Insulated Power Cable Engineers Association
MCSD	McKinleyville Community Services District
MBMA	Metal Building Manufacturer's Association
MSS	Manufacturers Standardization Society of the Valve and Fitting Industry Standards

NBFU	National Board of Fire Underwriters
NBS	National Buildings Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NPDES	National Pollution Discharge Elimination System
OSHA	Occupational Safety and Health Act of 1970
PCA	Portland Cement Association
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
SWRCB	State Water Resources Control Board
UBC	Uniform Building Code
USPHS	United States Public Health Service
UL	Underwriter's Laboratory
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USAS	The United States of America Standard Institute
USBR	United States Bureau of Reclamation
WCLIB	West Coast Lumber Inspection Bureau
WIC	Woodwork Institute of California

"Bureau" - United States Bureau of Reclamation
"State" - State of California
"State Standard Specifications" - Standard Specifications issued by the State of California Business and Transportation Agency, Department of Transportation, latest edition, unless a specific edition is referenced.

A-3 Definitions

a) Acceptance - The formal written acceptance by the DISTRICT of the entire Contract which has been completed in all respects in accordance with the Specifications and any approved modifications.

b) Addenda - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, Drawings and Specifications by additions, deletions, clarifications or corrections.

c) As Approved - The words "as approved" unless otherwise qualified, shall be understood to be followed by the words "by the Engineer."

d) Bid - The offer of the Bidder for the Work when made out and submitted on the prescribed bid form, properly signed and guaranteed. A Bid is also known as a Proposal.

e) Bid Bond - The cash, cashier's check, certified check, or bidder's bond accompanying the Bid submitted by the bidder, as a guarantee that the Bidder will enter into a Contract with the DISTRICT for the performance of work herein described.

f) Bidder - Any individual, firm, partnership or corporation submitting a bid for the work contemplated, and acting directly or through a duly authorized representative.

g) Change Orders - A written order to the Contractor authorizing an addition, deletion, or revision in the work within the general scope of the Contract Documents or authorizing adjustment in the Contract price or Contract time.

h) Claim - A separate demand by the Contractor for (i) a time extension, (ii) payment of money or damages arising from work done by or on behalf of the Contractor pursuant to the Contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (iii) an amount the payment of which is disputed by the DISTRICT.

i) Contract - The written agreement covering the performance of the work and the furnishing of labor, materials, tools and equipment in the construction of the Work. The Contract shall include all Contract Documents and supplemental agreements amending or extending the work contemplated which may be required to complete the Work in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments or extensions to the Contract and include Addenda and Contract Change Orders.

j) Contract Documents - The Contract Documents are any or all of the documents listed in the Contract Agreement.

k) Contract Price - Total monies payable to the Contractor under the terms and conditions of the Contract Documents.

l) Contract Time - The numbers of days stated in the Contract Documents for the completion of the Work.

m) Contractor - The person or persons, firm, partnership or corporation or other entity that has entered into the Contract with the DISTRICT to perform the Work.

n) Contract Drawings - "Contract Drawings" or "drawings" means and includes:

(i) all drawings which have been prepared on behalf of the DISTRICT and which are included in the Contract Documents and all modifying drawings issued by addenda thereto;
(ii) all drawings submitted pursuant to the terms of the Contract by the Contractor with his proposal and by the Contractor to the DISTRICT during the progress of the Work when accepted by the Engineer. Except where a specific type of drawing is indicated, the terms "Drawings" and "Plans" are used interchangeably throughout the Contract Documents and the Plans are Drawings as defined above.

o) County - County of Humboldt, California.

p) Date of Execution of the Contract - The date on which the Contract is signed by the DISTRICT's authorized representative.

q) Datum - The figures given in the Specifications or upon the Drawings after the word "Elevation" or an abbreviation of it shall mean NAVD 88 datum unless noted otherwise.

r) Days - Unless otherwise designated, days as used in the Contract Documents shall mean calendar days.

s) District - The McKINLEYVILLE COMMUNITY SERVICES DISTRICT, may also be referred to as the DISTRICT or OWNER.

t) Engineer - Wherever in these documents the word "Engineer" appears, it shall be understood to mean GHD Inc. The Engineer will have final authority with regards to contract administration, field inspection, and related items.

u) Field Order - A written order effecting a change in the Work not involving an adjustment in the Contract Price or an extension of Contract Time, issued by the Engineer to the Contractor during construction.

v) His - "His" shall include "her" and "its".

w) Install - "Install" wherever and in whatever manner used shall mean the installation, complete in place of an item.

x) Notice of Award - The written notice of the acceptance of the Bid from the DISTRICT to the successful Bidder.

y) Notice to Proceed - Written communication issued by the DISTRICT to the Contractor authorizing him to proceed with the Work and establishing the date of commencement of the Work.

z) Or Equal - The terms "or equal" or "approved equal" shall be understood to indicate that the "equal" product be the same or better than the product named in function, performance, reliability, quality and general configuration. Determination of equality in reference to the project design requirement will be made by the Engineer.

aa) District Project Representative – The authorized representative of the DISTRICT who is assigned to the project site or any part thereof.

bb) Plans or Specification Drawings - The term "Plans or Specification Drawings" refers to the official Plans, profiles, cross sections, elevations, details, and other working drawings and supplementary drawings, or reproductions thereof, signed by the Engineer, which show the location, character, dimensions, and details of the work to be performed. Plans may either be bound in the same book as the balance of the Contract Documents or bound in separate sets, and are a part of the Contract Documents, regardless of the method of binding.

cc) Project - The undertaking performed as provided by the Contract Documents.

dd) Provide - "Provide" wherever and in whatever manner used shall be understood to mean furnish and install.

ee) Project Geotechnical Engineer – Geotechnical report was prepared by Crawford & Associates and is dated March 24, 2022.

ff) Resident Project Representative - Authorized representative of the Engineer who is assigned to the Project or any part thereof.

gg) Service of Notice - Any notice from one party to the other under the Contract shall be in writing and shall be dated and signed by the party giving such notice or by a duly authorized representative thereof. Any such notice shall not be effective for any purpose whatsoever unless service in the following manner:

(i) If the notice is given to the DISTRICT by personal delivery thereof, the DISTRICT'S Project Representative or by depositing the notice in the U.S. mail, enclosed in a sealed envelope addressed to McKINLEYVILLE COMMUNITY SERVICES DISTRICT, P.O. Box 2037, 1656 Sutter Road, McKinleyville, CA 95519, postage prepaid, by certified mail return receipt requested.

(ii) If the notice is given to the Contractor, by personal delivery to the Contractor or its duly authorized representative at the project site or by depositing in the U.S. mail, enclosed in a sealed envelope address to the Contractor on the Contract Form, postage prepaid, by certified mail, return receipt request.

(iii) If the notice is given to the Surety or any other person, by personal delivery to such Surety or other person by personal delivery to such Surety or other person by depositing in the U.S. mail, enclosed in a sealed envelope, addressed to the surety or other person at the address of such Surety or other person last communicated to the party giving the notice, postage prepaid, by certified mail return receipt requested.

hh) Shall or Will - “Shall,” or “Will,” whenever used to stipulate anything, means shall or will be done or be performed by either the Contractor or the DISTRICT and means that the Contractor or the DISTRICT has thereby entered into a covenant with the other party to do or perform the same.

ii) Shop Drawing - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.

jj) Shown - “Shown,” “indicated,” “detailed,” and words of like import, wherever and in whatever manner used, with or without reference to the drawings, means shown, indicated or detailed on the Drawings or Plans.

kk) Specifications - A part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship, including the General Conditions.

ll) Specified - “Specified,” “described,” or “noted,” wherever and in whatever manner used, means as specified, described or noted in the Contract Documents.

mm) Subcontractors - The term "Subcontractor", as employed herein, includes only those having a direct contract with the Contractor and it includes one who furnishes material worked to a special design according to the Plans or Specifications of this Work, but does not include one who merely furnishes material not so worked and would be considered a supplier only.

nn) Substantial Completion - That date as certified by the Engineer when the construction of the Project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Project or specified part can be utilized for the purposes for which it is intended.

The Engineer may, at its sole discretion, issue a written notice of substantial completion for the purpose of establishing the starting date for specific equipment guarantees, and to establish the date that the DISTRICT will assume the responsibility for the cost of operating such equipment. Said notice shall not be considered as final acceptance of any portion of the Work or relieve the Contractor from completing the remaining work within the specified time and in full compliance with the Contract Documents.

oo) Sufficient - “Sufficient,” “necessary,” or “proper,” “acceptable,” “satisfactory,” “desirable,” and words of like import, wherever and in whatever manner used, with or without reference to the Engineer, means sufficient, necessary, proper, acceptable, satisfactory and desirable in the judgment of the Engineer.

pp) Supplementary Conditions (not included for this project) - Modifications to General Conditions required by a Federal Agency for participation in the PROJECT and approved by the Agency in writing prior to inclusion in the Contract Documents, or such requirements that may be imposed by applicable State laws.

References to “Supplemental General Conditions” in the General Conditions and elsewhere in the Contract Documents shall be construed to read “Supplementary Conditions.”

qq) Supplier - Any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

rr) Time Limits - All time limits stated in the Contract Documents are of the essence of the Contract.

ss) Work - All the work specified, indicated, shown or contemplated in the Contract to construct the improvements, including all alterations, amendments or extensions thereto made by Contract

Change Order or other written orders of the Engineer.

tt) Written Notice - "Written Notice" shall be deemed to have been duly served when delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended or if delivered at or sent by registered mail to the last business address known to it who gives the notice, or sent by email.

uu) Whenever in the Specifications or upon the Drawings the words DIRECTED, REQUIRED, PERMITTED, ORDERED, DESIGNATED, PRESCRIBED, or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation or prescription of the Engineer is intended, and similarly the words APPROVED, ACCEPTABLE, SATISFACTORY, or words of like import, shall mean approved or acceptable to, or satisfactory to the Engineer, unless otherwise expressly stated.

SECTION B
GENERAL CONDITIONS

ARTICLE I. SCOPE OF WORK

B-1 Intent of Contract Documents

The intent of the Contract Documents is to prescribe the details for the construction and completion of the Work which the Contractor undertakes to perform in accordance with the terms of the Contract. Where the Specifications and Plans describe portions of the Work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, the Contractor shall furnish all labor, materials, tools, equipment and incidentals and do all the work involved in performing the Contract in a satisfactory and workmanlike manner, ready for use occupancy or operation by the DISTRICT.

The technical provisions are presented in sections for convenience. However, this presentation does not necessarily delineate trades or limits of responsibility. All sections of the Specifications and Plans are interdependent and applicable to the Project as a whole.

The Contract Documents are complementary, and what is called for in any one shall be as binding as if called for in all.

Anything shown on the Drawings and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Drawings shall have the same effect as if shown or mentioned respectively in both. Any work shown on one drawing shall be construed to be shown in all drawings and the Contractor will coordinate the Work and the Drawings. If any portion of the Contract Documents shall be in conflict with any other portion, the various documents comprising the Contract Documents shall govern in the following order of precedence: The DISTRICT-Contractor Contract; the Bid; any Supplementary or Special Conditions; Instructions to Bidders; the General Conditions; the Specifications; the Drawings. Technical Specifications take priority over general Specifications and detail Drawings take precedence over general Drawings. As between schedules and information given on Drawings, the Schedules shall govern. As between figures given on Drawings and the scaled measurements, the figures shall govern. As between large-scale Drawings and small-scale Drawings, the larger scale shall govern. Any conflict or inconsistency between or in the Drawings shall be submitted to the Engineer through the DISTRICT'S Project Representative or Resident Project Representative in writing. Work done by the Contractor after discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's own risk.

B-2 Contractor's Understanding

It is understood and agreed that the Contractor has, by careful examination, satisfied themself as to the

nature and location of the Work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under this Contract. No verbal agreement or conversation with any officer, agent or employee of the DISTRICT, either before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.

Contractor shall comply with all Federal, State, and Local laws and regulations applicable to this scope of work and said project, as well as all permits and environmental conditions established for this project (see section B-13). Contractor is responsible for obtaining all necessary permits for construction except for those permits already obtained by the DISTRICT prior to construction. If a Contractor materially fails to comply with any term of this award, whether stated in a Federal statute or regulation, an assurance, in a State plan or application, a notice of award, or elsewhere, the DISTRICT may take one or more of the actions outlined in 2 CFR Section 200.338, including termination of the project. Project awards may be terminated for convenience through the procedures outlined in 2 CFR Section 200.339.

B-3 Changes in the Work

The DISTRICT may, at any time, by written order make changes in the Work including but not limited to: (a) changes in the Specifications or Drawings; (b) changes in the sequence, method or manner of performance of the Work; (c) changes in the owner-furnished facilities, equipment, materials, services or site; or (d) changes directing acceleration of the Work. If such changes cause an increase or decrease in the Contractor's cost of, or time required for, performance of the Contract an equitable adjustment will be made and the Contract modified in writing accordingly.

Such modification will be in the form of a Contract Change Order which will set forth the work to be done or the method by which the change and cost adjustment, if any, will be determined, and the time of completion of the Work.

To comply with the California Environmental Quality Act (CEQA), material additions or amendments to this scope of work (SOW) may have to be reviewed by all government agencies participating in the CEQA process. CEQA compliance for all SOW additions or amendments is essential before the revised SOW can be approved or implemented by the DISTRICT. Any construction activities associated with a SOW change, prior to DISTRICT approval, may be ineligible for reimbursement. The Contractor shall obtain approval in writing from the DISTRICT prior to proceeding with any changes of work.

The compensation to be paid for any extra work or change shall be determined in one or more of the following ways or at DISTRICT's sole election:

a) By unit prices previously approved (unit prices previously approved shall be used in all cases for similar units unless mutually agreed that for some reason they are not applicable);

b) By estimate and acceptance of an agreed upon lump sum; or

c) On a time and materials basis involving the actual necessary expenses and other services necessary to complete the Work. In addition, there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual necessary expense to cover the cost of general overhead, general superintendence, other expenses and profit. In the events that items (a) and (b) above are not applicable, then this latter method (c) shall be used. Markup by Subcontractors on their work shall not exceed fifteen percent. Contractor's markup on Subcontractor's work shall not exceed five (5) percent.

The Contractor shall keep full and complete records of the actual cost of such work in the form and manner prescribed by the Engineer and shall permit the Engineer to have access to such records as may be necessary to assist in the determination of the compensation payable for such work.

The Engineer also may at any time by issuing a Field Order make changes in the details of the Work. The Contractor shall proceed with the performance of any change in the Work so ordered by the Engineer unless the Contractor believes that such Field Order entitles it to a change in the Contract Price or Time, or both in which event the Contractor shall give the Engineer written notice thereof within seven (7) calendar days after the receipt of the ordered change. The Contractor shall not execute such changes pending the receipt of an executed change order or further instruction from the DISTRICT.

If the Contractor is delayed in completing by reason of any change made pursuant to this section, the time for completion of the Work shall be extended by change order for a period agreed to, commensurate with such delay. The Contractor shall not be subjected to any claim for liquidated damages for this period of time, but the Contractor shall have no claim for any other compensation for any such delay.

B-4 Procedures and Allowable Costs on Changes

a) All changes which affect the cost or time of the construction of the project must be authorized by means of a Change Order. The Change Order will include extra work, work for which quantities have been altered from those shown in the bidding schedule, as well as decreases or increases in the quantities of installed units which are different than those shown in the bidding schedule because of final measurements. All changes should be recorded on a Change Order as they occur. Each Change Order must contain complete and detailed justification for all items addressed by the Change Order.

b) If the change in or addition to the Work will result in an increase in the contract sum, the DISTRICT shall have the right to require the performance thereof in any of the following ways, at DISTRICT's sole election:

(i) By unit prices previously approved (unit prices previously approved shall be used in all cases for similar units unless mutually agreed that for some reason they are not applicable);

(ii) By estimate and acceptance of an agreed upon lump sum; or

(iii) On a time and materials basis involving the actual necessary expenses and other services necessary to complete the work. In addition, there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual necessary expense to cover the cost of general overhead, general superintendence, other expenses and profit. In the events that items (a) and (b) above are not applicable, then this latter method (c) shall be used. Markup by Subcontractors on their work shall not exceed fifteen percent. Contractor's markup on Subcontractor's work shall not exceed five percent (5%).

c) If the DISTRICT elects to have the Change in the Work performed on a lump sum basis, such election shall be based on a lump sum proposal which shall be submitted by the Contractor within ten (10) calendar days of the DISTRICT's request therefor. Request for a lump sum proposal shall not be deemed an election to have the Work performed on a lump sum basis. The Contractor's proposal shall be itemized and segregated by labor and materials for the various components of the change (no aggregate labor total will be acceptable) and shall be accompanied by signed proposals of any Subcontractors which will perform any portion of the change, and of any persons who will furnish materials or equipment for incorporation therein. The proposal shall also include the Contractor's estimate of the time required to perform said changes or additional work.

The portion of the proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, may include reasonably anticipated gross wages of Job Site labor, including foremen, who will be directly involved in the Change in the Work (for such time as they will be so involved), plus payroll costs (including premium costs of overtime labor, if overtime is anticipated, social security, Federal or State unemployment insurance taxes and fringe benefits required by collective bargaining agreements entered into by the Contractor or any such Subcontractor in connection with such labor) and up to fifteen percent (15%) of such anticipated gross wages, but not payroll costs, as overhead and profit for the Contractor or any such

Subcontractor, as applicable (such overhead and profit to include all supervision except foremen.)

The portion of the proposal relating to materials may include the reasonably anticipated direct costs to the Contractor or to any of its Subcontractors of materials to be purchased for incorporation in the Change in the Work, plus transportation and applicable sales or use taxes and up to fifteen percent (15%) of said direct material costs as overhead and profit for the Contractor or any such Subcontractor (such overhead and profit to include all small tools), and may further include the Contractor's and any of its Subcontractors' reasonably anticipated rental costs in connection with the Change in the Work (either actual rates or discounted local published rates), plus up to five percent (5%) thereof as overhead and profit for the Contractor or any such Subcontractors, as applicable. If any of the items included in the lump sum proposal are covered by unit prices contained in the Contract Document, the DISTRICT may, if it requires the Change in the Work to be performed on a lump sum basis, elect to use these unit prices in lieu of the similar items included in the lump sum proposal in which event and appropriate deduction will be made in lump sum amount prior to the application of any allowed overhead and profit percentages. No overhead and profit shall be applied to any unit prices.

The lump sum proposal may include up to five percent (5%) of the amount which the Contractor will pay to any of its Subcontractors for the Change in the Work as a commission to the Contractor.

d) In the event that the Contractor fails to submit its proposal within the designated period, the Engineer may direct the Contractor to proceed with the Change or Addition to the Work and the Contractor shall so proceed. The Engineer shall determine the reasonable costs and time to perform the Work in question, which determination when approved by DISTRICT shall be final and binding upon the Contractor.

e) In the event that the parties are unable to agree as to the reasonable costs and time to perform the change in or addition to the Work based upon the Contractor's proposal and the Engineer and DISTRICT do not elect to have the change in the Work performed on a time and material basis, the Engineer and DISTRICT shall make a determination of the reasonable cost and time to perform the Change in the Work, based upon their own estimates, the Contractor's submission or combination thereof. A Change Order shall be issued for the amount of costs and time determined by the Engineer and the DISTRICT and shall become binding upon the Contractor unless the Contractor submits its protest in writing to the DISTRICT within thirty (30) calendar days of the issuance of the Change Order. The DISTRICT has the right to direct the Contractor in writing to perform the Change in the Work which is the subject of the Change Order. Failure of the parties to reach agreement regarding the costs and time of the performing the Change in the Work and/or any pending protest shall not relieve the Contractor from performing the Change in the Work promptly and expeditiously.

f) If the DISTRICT elects to have the Change in the Work performed on a time and material basis, the same shall be performed, whether by the Contractor's forces or the forces of any of its Subcontractors or Sub-subcontractors, at actual costs to the entity or entities performing the Change in the Work (without any charge for administration, clerical expense, supervision or superintendence of any nature whatsoever, including foremen, or the costs, use or rental of tools or plant), plus fifteen percent (15%) thereof as the total overhead and profit to the entity or entities actually performing the change (except that this fifteen percent (15%) shall not be applied against any payroll costs, defined herein with respect to lump sum proposals). If the entity or entities actually performing the work are Subcontractors or Sub-subcontractors, the Contractor shall be allowed five percent (5%) of the total charge of the performing entity or entities (including mark-up) as Contractor's mark-up. No other mark-ups shall be allowed hereunder. The Contractor shall submit to the DISTRICT daily work and material tickets, to include the identification number assigned to the Change in the Work, the location and description of the Change in the Work, the

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

g) No overhead and profit will be paid by the DISTRICT on account of a Change in the Work except as specifically provided in this Section B-4. Overhead and Profit, as allowed under this paragraph, shall be deemed to include all costs and expenses which the Contractor or any of its Subcontractors may incur in the performance of the Change in the Work and which are not otherwise specifically recoverable by them pursuant to this paragraph.

h) The Contractor shall not be entitled to any amount for indirect costs, damages or expenses of any nature, including, but not limited to, so-called "impact" costs, labor inefficiency, wage, material or other escalations beyond the prices upon which the proposal is based and to which the parties have agreed pursuant to the provisions of this section, and which the Contractor, its Subcontractors and Sub-subcontractors or any other person may incur as a result of delays, interferences, suspensions, changes in sequence or the like, for whatever cause, whether reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable, arising from the performance of any and all Changes in the Work performed pursuant to this section. It is understood and agreed that the Contractor's sole and exclusive remedy in such event shall be recovery of its direct costs as compensable hereunder and an extension of the time of the Contract, but only in accordance with the provisions of the Contract Documents.

The Contractor agrees that it shall not be entitled to claim damages for anticipated profits on any portion of work that may be deleted. The amount of any adjustment for work deleted shall be estimated at the time deletion of work is ordered and the estimated adjustment will be deducted for the subsequent monthly pay estimates.

The DISTRICT reserves the right to contract with any person or firm other than the Contractor for any or all extra work.

B-5 Unilateral Change in or Addition to the Work

Notwithstanding the above, the DISTRICT, directly or through the Engineer, may direct the Contractor in writing to perform changes in or additions to the scope of the Contract. The Contractor shall perform such work and the parties shall proceed pursuant to the provisions of Section B-4.

B-6 Differing Site Conditions

The Contractor shall promptly, and before the following conditions are disturbed, notify the DISTRICT in writing of any:

a) Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25118 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law; or

b) Subsurface or latent physical conditions at the site differing from those indicated in the Contract Documents; or

c) Unknown conditions at the site of any unusual nature, different materially from those ordinarily

encountered and generally recognized as inherent in work of the character provided for in the Contract.

The Engineer shall thereupon promptly investigate the conditions. If the Engineer finds that they do involve hazardous waste, or do materially differ and cause any decrease or increase in the Contractor's cost or time of performance, it will issue a Change Order as appropriate. Any increase or decrease in the cost of the Work or the time for performance shall be adjusted in the manner provided herein for adjustments as to extra and/or additional work and changes. The procedures applicable to claims per extra costs shall then apply.

In accordance with 36 CFR Part 800, in the event a potential historic property or cultural resource is discovered during construction activities, the Contractor must cease work in the vicinity of the discovery and take all reasonable measures to avoid or minimize harm to the discovered property/resource. Construction activities in the area of the discovery shall not resume until the DISTRICT concludes consultation with the State Historic Preservation Officer (SHPO) for treatment of the discovery.

B-7 Claims for Extra Costs

a) The Plans for Work show the conditions as they are supposed or believed by the Engineer to exist, but it is neither intended nor to be inferred that the conditions as shown thereon constitute a representation by the DISTRICT or its officers that such conditions are universally existent nor shall the DISTRICT or any of its officers or representatives be liable for any loss sustained by the Contractor as a result of any variance between conditions as shown on the Plans and alternate conditions revealed during the progress of the Work, or otherwise.

b) The DISTRICT assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract, and (2) the Contract expressly provides that the responsibility therefor is assumed by the DISTRICT.

c) It is hereby mutually agreed that the Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the Engineer or the DISTRICT, or the happening of any event, thing or occurrence, unless the Contractor shall have given the Engineer due written notice of potential claims as hereinafter specified.

d) The written notice of potential claims shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. Except as provided in Section B-6, the notice as above required shall be given to the Engineer at least 48 hours prior to the time that the Contractor commences performance of the work giving rise to the potential claim for additional compensation. If such notice is not given, the Contractor shall be barred from making any such claim for extra compensation.

e) The Contractor may submit a claim to the Engineer concerning any matter for which a protest under Section B-3 or a notice of potential claim is filed within sixty (60) calendar days following the submission of said protest or notice, unless, due to the nature of the claim or the uncompleted state of the work, it is impracticable to determine the amount or the extent of the claim within such period, in which case a claim may be submitted at the earliest time thereafter that such determination can be made, but in no event later than the final release by the Contractor provided for in Section B-71. The claims shall set forth clearly and in detail, for each item of additional compensation claimed, the reasons for the claim, reference to applicable provisions of the Specifications, the nature and the amount of the cost involved, the computations used in determining such costs, and all pertinent factual data. The Contractor shall maintain complete and accurate records of the cost or any portion of the Work for which additional compensation is

claimed, and shall provide the Engineer with copies thereof, as required.

f) The Engineer will, within a reasonable time after submission of the Contractor's claim, make decisions in writing on all claims of the Contractor. All such decisions of the Engineer shall be final unless the Contractor shall within ten (10) calendar days after receipt of the Engineer's decision, file with the Engineer a written protest, stating clearly and in detail the basis thereof. Such protest will be forwarded promptly by the Engineer to the DISTRICT, which will issue a decision upon each such protest, and the DISTRICT's decision will be final. Pending such decision, the Contractor shall proceed with its work in accordance with the determination or instructions of the Engineer. It is hereby agreed that the Contractor's failure to protest the Engineer's determination or instructions, within ten (10) calendar days from and after the Engineer's determinations or instructions, shall constitute a waiver by the Contractor of all its rights to further protest, judicial or otherwise.

g) It is the intention of this Section that the differences between the parties, arising under and by virtue of the Contract, be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible or other appropriate action promptly taken. The Contractor hereby agrees that it shall have no right to additional compensation for any claim that may be based on any act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was timely filed.

h) In the event of an emergency endangering life or property, the Contractor shall act as stated in Section B-62 herein, and after execution of the emergency work shall present an accounting of labor, materials and equipment in connection therewith. The procedure for any payment that may be due for emergency work will be as specified in Section B-3 herein.

B-8 Disputes

Except as otherwise specifically provided in the Contract Documents, the Engineer will initially decide all claims of the Contractor and all disputes arising under and by virtue of the Contract. Such claim or dispute will be processed and decided by the Engineer as soon as practicable after its submission and the submission or availability of any additional information necessary to its decision. If the Contractor is dissatisfied with the Engineer's decision, the Contractor may, within 15 calendar days from the date of the Engineer's decision, follow the procedures set forth in Section B-55. If the Contractor fails to follow the procedures set forth in Section B-55 within the 15 calendar day period, then the Engineer's decision shall be final, conclusive, and binding on the Contractor.

B-9 Guarantee

a) In addition to warranties, representations and guarantees stated elsewhere in the Contract Documents, the Contractor unconditionally guarantees all materials and workmanship furnished hereunder, and agrees to replace at its sole cost and expense, and to the satisfaction of the Engineer and the DISTRICT, any and all materials which may be defective or improperly installed.

b) The Contractor shall repair or replace to the satisfaction of the Engineer any or all such work that may prove defective in workmanship or materials, ordinary wear and tear excepted, together with any other work which may be damaged or displaced in so doing.

c) In the event of failure to comply with the above stated conditions within a reasonable time, the DISTRICT is authorized to have the defect repaired and made good at the expense of the Contractor who will pay the costs and charges therefor immediately upon demand, including any reasonable management and administrative costs, and engineering, legal and other consultant fees incurred to enforce this section.

d) The signing of the Contract by the Contractor shall constitute execution of the above guarantees.

Except as otherwise provided in this Contract, the guarantees and warranties shall remain in effect through the one-year maintenance warranty period specified in the Performance Bond.

ARTICLE II. CONTROL OF WORK

B-10 Authority of the Engineer

a) The Engineer is the representative of the DISTRICT and has full authority to interpret the Contract Documents, to conduct the construction review and inspection of the Contractor's performance, and to decide questions which arise during the course of the work and its decisions on these matters shall be final and conclusive. The Engineer has the authority to reject all work and materials which do not conform to the Contract Documents, and has the authority to stop the work whenever such stoppage may be necessary to ensure the proper execution of the Contract.

If at any time the Contractor's work force, tools, plant or equipment appear to the Engineer to be insufficient or inappropriate to secure the required quality of work or the proper rate of progress, the Engineer may order the Contractor to increase their efficiency, improve their character, to augment their number or to substitute other personnel, new tools, plant or equipment, as the case may be, and the Contractor shall comply with such order.

b) Neither the failure of the Engineer to demand such increase of efficiency, number, or improvement, nor the compliance by the Contractor with the demand, shall relieve the Contractor of its obligation to provide quality work at the rate of progress necessary to complete the Work within the specified time.

c) The Engineer shall have the authority to make minor changes in the Work, not involving extra costs, and not inconsistent with the purposes of the Work.

d) Any order given by the Engineer, not otherwise required by the Contract Documents to be in writing shall, on request of the Contractor, be given or confirmed by the Engineer in writing.

e) Whenever work, methods of procedure, or any other matters are made subject to direction or approval, such direction or approval will be given by the Engineer.

f) The Engineer shall not be responsible for the construction means, controls techniques, sequences procedures or construction safety.

g) It is expressly agreed and understood that GHD Inc. will have no liability whatsoever resulting from the obligations entered into under the Contract except as provided in any scope of work agreement between GHD Inc. and the DISTRICT; that the DISTRICT must look solely to the Contractor for the furnishing of the Work; that the Contractor must look solely to the DISTRICT for payment; and that the DISTRICT and the Contractor must look solely to each other for the enforcement of any claims or liabilities arising under or by reason of the Contract.

B-11 Drawings

a) Drawings furnished herewith are for bidding purposes. The Engineer will furnish the Contractor additional copies of the Contract Documents and full-size plans. Additional copies may be obtained by paying the actual cost of reproduction. The Contractor shall have no claim for excusable delay on account of the failure of the Engineer to deliver such drawings unless the Engineer shall have failed to deliver the same within fourteen (14) calendar days after receipt of written demand therefor from the Contractor. The Contractor shall keep one copy of said drawings, in good order, available to the Engineer and its representatives, and convenient to the working site. The Contractor shall maintain on the job site and make available to the Engineer on request, one current full-sized marked-up set of design drawings which accurately indicate all variations in the completed work that differ from the design information shown on the Plans. If the Contractor, in the course of the Work, finds any discrepancy between the Drawings and the physical condition of the locality, or any errors or omissions in the Drawings, or in the layout as given by points and

instructions, it shall be the Contractor's duty to inform the Engineer in writing, and the Engineer will promptly verify the same. Any work done after such discovery, until authorized, will be done at the Contractor's risk. All Drawings, Specifications, and copies thereof furnished by the Engineer are the property of the Engineer and shall not be reused on other work and, with the exception of the signed Contract sets, are to be returned to the Engineer, on request, at the completion of the Work. All models are the property of the DISTRICT. The Contractor may be furnished additional instructions and detail drawings by the Engineer as necessary to carry out the work required by the Contract Documents.

The additional drawings and instructions thus supplied, will become part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.

b) The Drawings shall be supplemented by such shop drawings prepared by the Contractor as are necessary to adequately control the Work. No changes shall be made by the Contractor in any shop drawings after they have been reviewed by the Engineer.

c) Shop Drawings for any structure shall include, but not be limited to: stress sheets, anchor bolt layouts, shop details, and erection plans, which shall be reviewed and accepted by the Engineer before any such work is performed.

d) Contractor agrees that shop drawings processed by the Engineer are not Contract Change Orders; that the purpose of shop drawings submitted by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept, that it demonstrates its understanding by indicating which equipment and material it intends to furnish and by detailing the fabrication methods it intends to use.

e) It is expressly understood, however, that favorable review of the Contractor's shop drawings shall not relieve the Contractor of any responsibility for accuracy of dimensions and details, or for mutual agreements of dimensions and details. It is mutually agreed that the Contractor shall be responsible for agreement and conformity of its shop drawings with the Specifications. Contractor further agrees that if deviations, discrepancies or conflicts between shop drawings and Specifications are discovered either prior to or after shop drawings are processed by the Engineer, the Specifications shall control and shall be followed.

f) Unless otherwise stated, the Engineer shall have thirty (30) calendar days from the date of receipt of shop drawings for review.

g) Full compensation for furnishing all submittals and shop drawings shall be considered as included in the prices paid for the Contract items of Work to which such drawings relate and no additional compensation will be allowed therefor. Any cost related to the Engineer's review of any particular set of submittals or shop drawings more than twice, due to incompleteness or unacceptability, shall be borne by the Contractor, and the DISTRICT reserves the right to withhold such costs from payments due the Contractor.

h) When submitted for the Engineer's review, Shop Drawings shall bear the Contractor's certification that he has reviewed, checked and approved the Shop Drawings and that they are in conformance with the requirements of the Contract Documents.

i) That portion of the Work requiring a shop drawing or sample submission shall not begin until the shop drawing or submission has been approved by the Engineer. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

j) Acceptance by the Engineer of any drawing, method of work, or any information regarding

materials and equipment the Contractor proposes to furnish shall not relieve the Contractor of responsibility for any errors therein and shall not be regarded as an assumption of risks or liability by the Engineer or DISTRICT, or any officer or employee thereof, and the Contractor shall have no claim under the Contract on account of the failure or partial failure or inefficiency or insufficiency of any plan or method or work or material and equipment so accepted. Such acceptance shall be considered to mean merely that the Engineer has no objection to the Contractor using, upon his own full responsibility, the plan or method of work proposed, or furnishing the materials and equipment proposed.

B-12 Construction Staking and Surveys

The Contractor shall furnish land surveys deemed necessary for locating the principal component parts of the Work.

B-13 Permits and Regulations

Permits, licenses, and easements of a temporary or permanent nature, necessary for the prosecution of the Work shall be secured and paid for by the Contractor, except as noted in Section B-32, and herein.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as shown on the Plans and described in the Specifications. The Contractor shall promptly notify the Engineer in writing of any specification at variance therewith and any necessary changes shall be adjusted as provided in the Contract for Changes in the Work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules, and regulations and without such notice to the Engineer, it shall bear all costs arising therefrom.

B-14 Conformity with Contract Documents and Allowable Deviations

Work and materials shall conform to the lines, grades, cross sections, dimensions and material requirements, including tolerances, shown on Contract Documents. Although measurement, sampling, and testing may be considered evidence as to such conformity, the Engineer shall be the sole judge as to whether the work or materials deviate from the Specifications and Plans, and its decision as to any allowable deviations therefrom shall be final and conclusive.

Whenever a material, article or piece of equipment is identified on the Drawings or Specifications by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered as described in Section B-28. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Engineer, such material, article, or piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor. Any cost differential shall be deductible from the Contract Price and the Contract Documents shall be appropriately modified by Change Order. The Contractor warrants that if substitutions are approved, no major changes in the function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitution will be made by the Contractor without a change in the Contract Price or Contract Time.

B-15 Coordination and Interpretation of Contract Documents

a) The Contract Documents are complementary and a requirement occurring in one is as binding as though occurring in all.

b) In the event of conflict between the Plans and the Technical Specifications, the Technical Specifications shall govern, except that, where items are shown on the Plans and are not

specifically included in the Technical Specifications, the Plans shall govern.

c) Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Specifications or Plans, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform to them as part of the Contract. In the event of any doubt or question arising respecting the true meaning of the Specifications and Plans, reference shall be made to the Engineer, whose decision thereon shall be final and conclusive.

d) In the event of any discrepancy between any plans and the figures written thereon, the figures shall be taken as correct. Detailed drawings shall prevail over general drawings.

e) Any reference made in these Specifications or on the plans to any Specification, standard, method, or publication of any scientific or technical society or other organization shall, in the absence of a specific designation to the contrary, be understood to refer to the Specification, standard, method, or publication in effect as of the date that the Work is advertised for Bids.

B-16 Subcontracts

a) In accordance with 2 CFR Section 200.213, the Contractors must not make any award or permit any award (subgrant or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs under Executive Order 12549, “Debarment and Suspension.”

b) The attention of the Contractor is directed to the provisions of Public Contract Code sections 4100-4113, regarding subcontracting and said provisions are by this reference incorporated herein and made a part hereof.

c) Each Subcontract shall contain a suitable provision for the suspension or termination thereof should the Work be suspended or terminated or should the Subcontractor neglect or fail to conform to every provision of the Contract Documents insofar as such provisions are relevant. No Subcontractor or supplier will be recognized as such, and all persons engaged in work will be considered as employees of the Contractor, and the Contractor will be held responsible for their work, which shall be subject to the provisions of the Contract Documents. The Contractor shall be fully responsible to the DISTRICT for the acts or omissions of its Subcontractors and of the persons either directly or indirectly employed by him. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the DISTRICT. If a legal action, including arbitration and litigation, against the DISTRICT is initiated by a Subcontractor or Supplier, the Contractor shall reimburse the DISTRICT for the amount of legal, engineering and all other expenses incurred by the DISTRICT in defending itself in said action.

d) The DISTRICT and the Engineer reserve the right to approve all Subcontractors. Such approval shall be a consideration to the awarding of the Contract and unless notification to the contrary is given to the Contractor prior to the signing of the Contract, the list of Subcontractors which is submitted with its proposal will be deemed to be acceptable.

B-17 Cooperation of Contractors

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

b) When two or more contractors are employed on related or adjacent work, each shall conduct their operation in such a manner as not to cause any unnecessary delay or hindrance to the other. Each contractor shall be responsible to the other for all damage to work, to persons or property caused to the other by its operations, and for loss caused the other due to its unnecessary delays or failure to finish the Work within the time specified for completion.

B-18 Superintendence

a) The Contractor shall designate in writing before starting work an individual as authorized representative who shall have the authority to represent and act for the Contractor. This authorized representative shall be present at the site of the work at all times while work is actually in progress on the Contract. When work is not in progress and during periods when work is suspended, arrangements acceptable to the Engineer shall be made for any emergency work which may be required.

b) The Contractor is solely responsible, at all times, for the superintendence of the Work and for its safety and progress.

c) Whenever the Contractor or its authorized representative is not present on any particular part of the Work where it may be desired to give direction, orders will be given by the Engineer, which shall be received and obeyed by the superintendent or foreman who may have charge of the particular work in reference to which the orders are given.

d) Any order given by the Engineer, not otherwise required by the Specifications to be in writing, will on request of the Contractor, be given or confirmed by the Engineer in writing.

B-19 Inspection of Work

a) Unless otherwise provided, all equipment, materials, and work shall be subject to inspection and testing by the Engineer. The Engineer will observe the progress and quality of the Work and determine, in general, if the Work is proceeding in accordance with the intent of the Contract Documents. The Engineer shall not be required to make comprehensive or continuous inspections to check the quality of the Work, and it shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work. Visits and observations made by the Engineer shall not relieve the Contractor of its obligation to conduct comprehensive inspections of the Work and to furnish proper materials, labor, equipment and tools, and perform acceptable work, and to provide adequate safety precautions, in conformance with the intent of the Contract.

b) Whenever the Contractor varies the period during which work is carried on each day, it shall give due notice to the Engineer so that proper inspection may be provided. Any work done in the absence of the Engineer shall be subject to rejection. Proper facilities for safe access for inspection to all parts of the Work shall at all times be maintained for the necessary use of the Engineer and other agents of the DISTRICT, and agents of the Federal, State, or Local governments at all reasonable hours for inspection by such agencies to ascertain compliance with laws and regulations.

c) One or more inspectors may be assigned to observe the Work and to act in matters of construction under this Contract. It is understood that inspectors shall have the power to issue instructions and make decisions within the limitations of the authority of the Engineer. Such inspection shall not relieve the Contractor of its obligation to conduct comprehensive inspections of the work, to furnish proper materials, labor, equipment and tools, and perform acceptable work, and to provide adequate safety precautions in conformance with the intent of the Contract.

d) The Engineer and its representatives and the DISTRICT and its representatives shall at all times

have access to the Work wherever it is in preparation or progress, and the Contractor shall provide safe and convenient facilities for such access and for inspection. If the Specifications, the Engineer's instructions, laws, ordinances, or any public authority require any material, equipment or work to be specifically tested or approved, the Contractor shall give the Engineer timely notice of its readiness for inspection, and if the inspection is by an authority other than the DISTRICT, of the time fixed for inspection. Inspections by the Engineer will be made promptly and, where practicable, at the source of supply.

e) Work performed without inspection may be required to be removed and replaced under proper inspection and the entire cost of removal and replacing, including the cost of DISTRICT-furnished materials used in the Work, shall be borne by the Contractor, regardless of whether or not the Work exposed is found to be defective. Examination of questioned work, other than that installed without inspection, may be ordered by the Engineer and, if so ordered, the work must be uncovered by Contractor. If such work is found to be in accordance with the Contract Documents, the DISTRICT will pay the cost of re-examination and replacement. If such work is found to be not in accordance with the Contract Documents, the Contractor shall pay such cost.

f) The inspection of the Work shall not relieve the Contractor of its obligation to fulfill the Contract as herein prescribed, or in any way alter the standard of performance provided by the Contractor, and defective work shall be made good and unusable materials may be rejected, notwithstanding that such work and materials have been previously overlooked by the Engineer and accepted or estimated for payment. If the Work or any part thereof shall be found defective, Contractor shall, within ten (10) calendar days, make good such defect in a manner satisfactory to the Engineer. If the Contractor shall fail or neglect to make ordered repairs of defective work or to remove the condemned materials from the Work within ten (10) calendar days after direction by the Engineer in writing, the DISTRICT may make the ordered repairs, or remove the condemned materials, and deduct the cost thereof from any monies due the Contractor.

g) The Contractor shall furnish promptly without additional charge all facilities, labor and materials reasonably needed by the Engineer for performing all inspection and tests. Contractor shall be charged with any additional cost of inspection when material and workmanship are not ready at the time specified by the Contractor for its inspection.

h) Where any part of the Work is being done under an encroachment permit or building permit, or is subject to Federal, State, County or City codes, laws, ordinances, rules or regulations, representatives of the government agency shall have full access to the Work and shall be allowed to make any inspection or tests in accordance with such permits, codes, laws, ordinances, rules, or regulations. If advance notice of the readiness of the Work for inspection by the governing agency is required, the Contractor shall furnish such notice to the appropriate agency.

i) The Engineer may inspect production of the material, or the manufacture of products at the source of supply. Plant inspection, however, will not be undertaken until the Engineer is assured of the cooperation and assistance of both the Contractor and the material producer. The Engineer or its authorized representative shall have free entry at all times to such parts of the plant as concerns the manufacture or production of the materials. Adequate facilities shall be furnished free of charge to make the necessary inspection. The DISTRICT assumes no obligation to inspect materials at the source of supply.

j) Forty-eight (48) hours prior to work being accomplished, the Contractor will notify the Engineer of the proposed working hours to accomplish the work for that day. A working day shall be 8 hours per day with allowable maximum of 40 hours per week. Any work hours outside of this shall be considered overtime. Overtime and shift work may be established as a regular procedure by the Contract and with the written permission of the Engineer. Such permission might not be granted and may be revoked at any time. No work other than overtime and shift work established as a regular procedure shall be done on Saturdays, Sundays, or legal holidays, unless if such work as

is necessary for the proper care and protection of the work already performed, or in case of an emergency.

All costs for the overtime inspection, including those occurring as a result of overtime and shift work established as a regular procedure, shall be paid for by the Contractor. Overtime inspection shall include inspection required during holidays, Saturdays, and Sundays. Such costs will include, but will not necessarily be limited to, engineering, inspection, general supervision and other expenses which are directly chargeable to the overtime work. All such charges shall be deducted by the DISTRICT from payment due the Contractor.

k) A prefinal inspection of the Work will be made by the DISTRICT and the Engineer. This inspection shall be made as soon as practical after Contractor has notified the DISTRICT in writing that the Work is ready for this inspection. The prefinal inspection shall be made prior to acceptance of any portion of the Work as being substantially complete and prior to filing the Notice of Completion.

A final inspection of all the Work will be made by the DISTRICT, Engineer, and Contractor.

B-20 Tests

The DISTRICT shall perform or witness all tests specified or required by the Technical Specifications. The responsibility for payment for these tests is also outlined in the Technical Specifications. In general, and unless explicitly stated otherwise, the Contractor is responsible for the performance of all tests required, and the payment for such tests is to be included in the Bid Item to which it relates. No additional payment will be made for the required testing. The Engineer will direct the Contractor to perform such tests as it deems necessary to determine the quality of work or compliance with Contract Documents. The Contractor shall furnish promptly without additional charge all facilities, labor, and material reasonably required for performing safe and convenient tests as may be required by the Engineer. The Contractor shall not be required to reimburse the DISTRICT for tests performed by the DISTRICT or Engineer above and beyond those outlined in the plans or specifications. If samples of materials are submitted which fail to pass the specified tests, the Contractor shall pay for all subsequent tests.

B-21 Removal of Rejected and Unauthorized Work and Materials

a) All work or materials which have been rejected shall be remedied, or removed and replaced by the Contractor in an acceptable manner and no compensation will be allowed it for such removal, replacement, or remedial work.

b) Any work done beyond the lines and grades shown on the plans or established by the Engineer or any extra work done without written authority will be considered as unauthorized work and will not be paid for. Upon order of the Engineer, unauthorized work shall be remedied, removed, or replaced at the Contractor's expense.

c) Upon failure of the Contractor to comply with any order of the Engineer made under this Section, the DISTRICT may cause rejected or unauthorized work to be remedied, removed or replaced, and may deduct the costs therefor from any monies due or to become due the Contractor.

d) If following the installation of any equipment furnished hereunder, defects requiring correction by the Contractor are found, the DISTRICT shall have the right to operate such unsatisfactory equipment and make reasonable use thereof until the equipment can be shut down for correction of defects without injury to the DISTRICT.

B-22 Deductions for Uncorrected Work

If the Engineer deems it inexpedient to correct work damaged or not done in accordance with the Contract, an equitable deduction from the Contract price shall be made therefor, and such sum may be

withheld by DISTRICT from Contractor's payment.

B-23 Equipment and Plants

a) If equipment is acquired by the contractor under this project and paid for by the DISTRICT, the use and disposition of the equipment shall be in compliance with 2 CFR Section 200.313.

b) Only equipment and plants suitable to produce the quality of work and materials required will be permitted to operate on the project.

c) Plants will be designed and constructed in accordance with general practice for such equipment and shall be of sufficient capacity to ensure the production of sufficient material to carry the Work to completion within the time limit.

d) The Contractor shall provide adequate and suitable equipment and plants to meet the above requirements, and when ordered by the Engineer, shall remove unsuitable equipment from the Work and discontinue the operation of unsatisfactory plants.

e) The Contractor shall identify each piece of its equipment, other than hand tools, by means of an identifying number plainly stenciled or stamped on the equipment at a conspicuous location, and shall furnish to the Engineer a list giving the description of each piece of equipment and its identifying number. In addition, the make, model number and empty gross weight of each unit of compacting equipment shall be plainly stamped or stenciled in a conspicuous place on the unit. The gross weight shall be either the manufacturer's rated weight or the scale weight.

f) In the case of termination of this Contract before completion from any cause whatever, the Contractor, if notified to do so by the DISTRICT, shall promptly remove any part or all of its equipment and supplies from the property of the DISTRICT. If the Contractor fails to do so, the DISTRICT shall have the right to remove such equipment and supplies at the expense of the Contractor.

B-24 Character of Worker

The Contractor shall employ only competent Subcontractors or skillful workers to do the work. If any Subcontractor, or person employed by the Contractor or any Subcontractor shall fail or refuse to carry out the directions of the DISTRICT or its agents or shall appear to the DISTRICT or its agents to be incompetent or to act in a disorderly or improper manner, they shall be removed from the project Work immediately on the requisition of the DISTRICT or its agents, and such person shall not again be employed on the Work. Such discharge shall not be the basis for any claim for compensation or damages against the DISTRICT, or any of its officers or agents.

B-25 Separate Contracts

The DISTRICT reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate its work with the other contractor's work.

If any part of the Contractor's work depends for proper execution or results upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. The Contractor's failure to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of its work, except as to defects which may develop in the other contractor's work after the execution of its work.

To ensure the proper execution of its subsequent work, the Contractor shall measure work already in place and shall at once report to the Engineer any discrepancy between the executed work and the

Drawings.

The DISTRICT may perform additional Work related to the Project itself, or it may let other contracts containing provisions similar to these. The Contractor will afford the other contractors who are parties to such contracts (or the DISTRICT, if the DISTRICT is performing the additional Work itself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work and shall properly connect and coordinate his Work with theirs.

If the performance of additional Work by other contractors or the DISTRICT is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof shall be given to the Contractor prior to starting any such additional Work. If the Contractor believes that the performance of such additional Work by the DISTRICT or others involves him in additional expense or entitles him to an extension of the Contract Time, he may make a claim therefore as provided in Section B-7 of this Contract.

B-26 Materials, Services and Facilities

a) Unless otherwise specifically stated in the Contract Documents, the Contractor shall furnish all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature on all of the facilities necessary for the execution and completion of the Work. Unless otherwise specified, all materials shall be new and shall be manufactured, handled, and installed in a workmanlike manner to ensure completion of the Work in accordance with the Contract Documents. The Contractor shall, upon request of the Engineer, furnish satisfactory evidence as to the kind and quality of materials.

b) Where materials are to be furnished by the DISTRICT, the type, size, quantity and location at which they are available will be stated in the Contract Documents.

c) Manufacturers' warranties, guarantees, instruction sheets and parts listed, which are furnished with certain articles or materials incorporated in the Work, shall be delivered to the Engineer before acceptance of the Contract.

d) Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

e) Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and approved by the Engineer.

f) Materials, supplies or equipment to be incorporated into the Work shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

g) The completed Work shall include all necessary permanent safety devices, such as machinery guards and similar ordinary safety items required by the State and Federal (OSHA) industrial safety authorities and applicable local and national codes. Further, any features of the Work subject to such safety regulations shall be fabricated, furnished, and installed in compliance with these requirements. Prior to performing Work specified herein, the Contractor shall request an inspection by a State Industrial Safety representative for the purpose of determining that the facilities provided are in compliance with the State and Federal safety requirements. Any facilities which are deemed necessary by official response following the above safety inspection shall be added or corrected as required as a part of the Contract Work. However, no payment will be made to the Contractor for such changes or additions to equipment furnished under this Contract since it is a requirement of these Specifications that such equipment be manufactured or fabricated in such a manner as to be in conformance with all Federal, State, and local safety requirements. The Contractor shall notify all manufacturers, equipment suppliers, and Subcontractors of the

provisions of this article.

h) In approving equipment for installation in the project, the DISTRICT and Engineer assume no responsibility for injury or claims resulting from failure of the equipment to comply with applicable National, State, and local safety codes or requirements, or the safety requirements of a recognized agency, or failure due to faulty design concepts, or defective workmanship and materials.

i) All materials incorporated into the job shall be new, especially purchased for the project unless otherwise specified or agreed in writing. Unless otherwise noted, any equipment offered shall be current modifications which have been in successful regular operation under comparable conditions for a period sufficient to determine the reliability of the product. This time requirement, however, does not apply to minor details nor to thoroughly demonstrated improvements in design or in materials of construction.

j) Whenever the Contractor shall furnish materials or manufactured articles or shall do work for which no detailed specifications are set forth, the materials or manufactured articles shall be of the best grade in quality and workmanship obtainable in the market from firms of established good reputation, or, if not ordinarily carried in stock, shall conform to the usual standards of first-class materials or articles of the kind required with due consideration of the use to which they are to be put. In general, the work performed shall be in full conformity and harmony with the intent to secure the best standard of construction and equipment of the work as a whole or in part.

k) If there is a residual inventory of unused supplies exceeding $5,000 in total fair market value upon completion of the Project, the Contractor shall notify the DISTRICT and provide unused supplies to the location and at the time arranged, for unloading and storage. The DISTRICT shall compensate the grant awarding agency for its share (2 CFR Section 200.314).

B-27 Storage of Materials

Materials shall be so stored as to ensure the preservation of their quality and fitness for the Work. When considered necessary, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground, and they shall be placed under cover. Stored materials shall be located so as to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the owner or lessee.

Electrical equipment, devices, and motors shall be placed in dry and warm storage as approved by the Engineer.

All equipment and materials which are not to be painted (such as aluminum and stainless steel) and all factory finished or coated equipment and materials which are not to be painted, that are installed prior to completion of adjacent work, shall be completely covered and protected.

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

B-28 Trade Names and Alternatives

For convenience in designation in the Specifications and Plans, certain articles or materials to be incorporated in the Work may be designated under a trade name or the name of a manufacturer and its catalog information. The use of an alternative article or material which is of equal quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:

a) The burden of proof as to the quality and suitability of alternatives shall be upon the Contractor and it shall furnish all information necessary as required by the Engineer. The Engineer shall be the sole judge as to the quality and suitability of alternative articles or materials and its decision shall be final.

b) Whenever the Specifications and Plans permit the substitution of a similar or equivalent material or article, no tests or action relating to the approval of such substitute material or article will be made until the request for substitution is made in writing by the Contractor accompanied by complete data as to the equality of the material or article proposed. Such request by the Contractor must be made within thirty-five (35) calendar days after award of Contract.

B-29 Certificate of Compliance

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

b) All materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that material is used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material in the Work which conforms to the requirements of the Contract Documents and any such material not conforming to such requirements will be subject to rejection whether in place or not.

c) The DISTRICT reserves the right to refuse to permit the use of material on the basis of a Certificate of Compliance.

d) The form of the Certificate of Compliance and its disposition shall be as directed by the Engineer.

B-30 Assignment

The Contractor shall not assign the Contract or sublet it as a whole or in part without the prior written consent of the DISTRICT, nor shall the Contractor assign any monies due, or to become due to it hereafter, without the prior written consent of the DISTRICT.

B-31 Use of Completed Portions, Right to Operate Unsatisfactory Equipment or Facilities

a) The DISTRICT may, at any time, and from time to time, during the performance of the Work, enter the work site for the purpose of installing any necessary work by the DISTRICT labor or other contracts, and for any other purpose in connection with the installation of facilities. In doing so, the DISTRICT shall endeavor not to interfere with the Contractor and the Contractor shall not interfere with other work being done by or on behalf of the DISTRICT.

b) If, prior to completion and final acceptance of all the Work, the DISTRICT takes possession of any structure or facility (whether completed or otherwise) comprising a portion of the Work with the intent to retain possession thereof (as distinguished from temporary possession contemplating the return to the Contractor), then, while the DISTRICT is in possession of the same, the Contractor shall be relieved of liability for loss or damage to such structure other than that resulting from the Contractor's fault or negligence. Such taking of possession by the DISTRICT shall not relieve the Contractor from any provisions of this Contract respecting such structure, other than to the extent specified in the preceding sentence, nor constitute a final acceptance of such structure or facility.

c) If, following installation of any equipment or facilities furnished by the Contractor, defects requiring correction by the Contractor are found, the DISTRICT shall have the right to operate such unsatisfactory equipment or facilities and make reasonable use thereof until the equipment or facilities can be shut down for correction of defects without injury to the DISTRICT.

B-32 Lands for Work, Right-of-Way Construction Roads

a) The DISTRICT will provide the lands, easements, and/or rights-of-way necessary or other rights to enter and work on lands necessary for the performance of the Work, except that it is the responsibility of the Contractor to finalize the Humboldt County Encroachment Permit. A draft Humboldt County Encroachment Permit has been included as an Appendix to these Specifications for purposes of providing the Contractor with an understand of requirements prior to submitting a bid. Other permits and licenses are addressed by sections B-13 and B-49. Should the Contractor find it advantageous to use any additional land for any purpose whatsoever, the Contractor shall provide for the use of such land at its expense. The Engineer shall be furnished with a copy of written agreements or otherwise be notified in writing of additional working space which is acquired. Nothing herein contained and nothing marked on the Plans shall be interpreted as giving the Contractor exclusive occupancy of the territory provided by the DISTRICT. When two or more contracts are being executed at one time on the same or adjacent land in such a manner that work on one contract may interfere with that on another, the Engineer shall decide which contractor shall cease work, and which shall continue, or whether the work on both contracts shall progress at the same time and in what manner, and the decision of the Engineer shall be final and binding. When the territory of one contract is the necessary or convenient means of access for the performance of another contract, such privilege of access or any other reasonable privilege may be granted by the Engineer to the contractor so desiring, to the extent, amount, in the manner, and at the time permitted. No such decision as to the method or time of conducting the work or the use of territory shall be the basis of any claim for delay or damage.

b) The limits of construction, including the limits of the Humboldt County Encroachment Permit (to be finalized by contractor) and a laydown area at the District office are shown on the Plans.

c) The Contractor shall construct and maintain all roads necessary to reach the various parts of the Work and for the transportation thereto of construction material and personnel. The cost of constructing and maintaining such roads shall be borne by the Contractor.

B-33 District's Right to Audit and Preservation of Records

a) The DISTRICT is responsible for obtaining audits in accordance with the Single Audit Act of 1996, in compliance with 2 CFR Section 200 Subpart F. The Contractor shall facilitate the completion of such an audit as it relates to the Contractor’s work on this project.

b) The Contractor shall maintain books, records and accounts of all costs in accordance with generally accepted accounting principles and practices. The DISTRICT, the Comptroller General of the United States, State of California, and its authorized representatives shall have the right to audit the books, records and accounts of the Contractor under any of the following conditions:

(i) The Contract is terminated for any reason in accordance with the provisions of the Contract Documents in order to arrive at equitable termination costs;
(ii) In the event of a disagreement between the Contractor and the DISTRICT over the amount due the Contractor under the terms of the Contract;
(iii) To check or substantiate any amounts invoiced or paid which are required to reflect the costs of the Contractor, or the Contractor's efficiency or effectiveness under this Contract or in connection with extras, changes, claims, additions, backcharges, or others, as may be provided for in this Contract; and/or
(iv) If it becomes necessary to determine the DISTRICT's rights and the Contractor's obligations under the Contract or to ascertain facts relative to any claim against the Contractor which may result in a charge against the DISTRICT;
(v) To determine any difference in cost occasioned by a permissible substitution;
(vi) To make audits, examinations, excerpts, and transcriptions pertinent to the loan financing on this project.

(vii) For any other reason in the DISTRICT's sole judgment.

c) If any of the conditions stated in paragraph B-33(b) are satisfied, Contractor shall provide the DISTRICT (or its representatives), unlimited, reasonable access during working hours to the Contractor's books and records under the conditions stated above. The DISTRICT's audit rights shall be liberally construed in the DISTRICT's favor.

d) The Contractor, from the effective date of final payment or termination hereunder, shall preserve and make available to the DISTRICT for a period of three (3) years thereafter, at all reasonable times at the office of the Contractor (but without any charge to the DISTRICT), all its books, records, documents, photographs, micro-photographs, and other evidence bearing on the costs and expenses of the Contractor under this Contract and relating to the Work hereunder.

e) The DISTRICT will make all payments required of it under this Contract subject to audit, under circumstances stated above, which audit may be performed at the DISTRICT's option, either during the Contract time period or during the record retention time period. Regardless of authorization, approval or acceptance, signatures or letters which are given by the DISTRICT and are part of the DISTRICT's control systems or are requested by the Contractor, the payments made under this Contract shall not constitute a waiver or agreement by the DISTRICT that it accepts as correct the billings, invoices or other charges on which the payments are based. If the DISTRICT's audit produces a claim against the Contractor, the DISTRICT may pursue all its legal remedies even though it has made all or part of the payments required by this Contract.

f) If any audit by the DISTRICT or its representative discloses an underpayment by the DISTRICT pursuant to the terms of the Contract Documents, the DISTRICT shall have the duty to pay any amount found by the audit to be owed to the Contractor. If such audit discloses an overpayment, the Contractor shall have the obligation to reimburse the DISTRICT for the amount of the overpayment. The DISTRICT's right to claim reimbursement from the Contractor of any overpayment shall not be terminated or waived until three years after the completion of the DISTRICT's audit or upon the termination of audit rights under subparagraph B-33(d), whichever date is later. The obligation of the Contractor to make reimbursements hereunder shall not terminate except as provided by law.

The DISTRICT's right to audit and the preservation of records shall terminate at the end of three (3) years after the date final payment is made or termination of the Contract. The Contractor shall include this "Right to Audit and Preservation of Records" clause in all subcontracts issued by it shall require the same to be inserted by all lower tier Subcontractors in their subcontracts, for any portion of the Work. Should Contractor fail to include this clause in any such contract or lower tier contract, or otherwise fail to ensure the DISTRICT's rights hereunder, Contractor shall be liable to the DISTRICT for all costs, expenses and attorney's fees which the DISTRICT may have to incur obtaining or attempting to obtain an audit or inspection of or the restoration of records which otherwise have been available to the DISTRICT from said persons under this clause. Such audit may be conducted by the DISTRICT or its authorized representative.

ARTICLE III. PROGRESS AND COMPLETION OF WORK

B-34 Progress Schedule

The Contractor shall submit to the DISTRICT such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data, where applicable, as are required by the Contract Documents for the Work to be performed.

Prior to the first partial payment estimate, the Contractor shall submit construction progress schedules showing the order in which it proposes to carry on the Work, including dates at which it will start the various parts of the Work, estimated date of completion of each part and as applicable:

a) The dates at which special detail drawings will be required; and

b) Respective dates for submission of shop drawings, the beginning of manufacture, the testing and the installation of materials, supplies, and equipment.

c) The Contractor shall also submit a schedule of payments that it anticipates it will earn during the course of the Work.

The progress schedules shall be submitted regularly and shall cover a time period satisfactory to the Engineer. The Contractor shall also forward to the Engineer, with the request for progress payment each month, a summary report of the progress of the various parts of the Work under the Contract in the shops and in the field, stating the existing status, rate of progress, estimated time of completion, and cause of delay, if any. If the Work is behind the submitted schedule, the Contractor shall submit in writing a plan acceptable to the DISTRICT and Engineer for bringing the Work up to schedule.

B-35 Commencement and Progress of the Work and Time of Completion

Prior to the start of construction, the DISTRICT will conduct a preconstruction conference. At the conference, the DISTRICT will review the planned development with the Engineer, Contractor, and other interested parties. Items to be reviewed include materials, equipment, rights-of-way, schedules and all arrangements for prosecuting the Work.

The Contractor shall begin work within twenty-one (21) calendar days after receiving a Notice to Proceed and shall diligently prosecute the work to completion within one hundred fifty (150) calendar days after beginning work. Engineer shall have the right to specify the locations where Contractor shall start and proceed with the Work.

B-36 Suspension of Work

a) The Engineer may at any time, by notice in writing to the Contractor, suspend any part of the Work for such period of time as may be necessary to prevent improper execution of the Work on the project by the Contractor, its Subcontractors or agents, and the Contractor shall have no claim for damages or additional compensation on account of any such suspension.

b) The DISTRICT may at any time suspend any part or all of the Work upon ten (10) calendar days written notice to the Contractor, who shall thereupon discontinue all Work suspended except for all operations to prevent loss or damage to Work already executed as may be directed by the Engineer. In the event a part of the Work is suspended, the Contractor, if the suspension is not through its fault or the fault of its Subcontractors or agents, shall be paid on the same basis as Extra Work for costs of work performed in accordance with such orders of the Engineer during such suspension, provided that this shall not include any cost pertaining to Work not suspended by said notice. Work shall be resumed by the Contractor after such suspension on written notice from the DISTRICT. In the event of suspension of the entire Work by the DISTRICT, the Contractor, if the suspension is not through fault of the Contractor or the fault of its Subcontractors or agents,

shall be paid the sum of $500.00 for each calendar day during which the entire Work shall have been suspended. Said sum is hereby mutually agreed upon as fixed and liquidated damages in full settlement of all costs and expenses, losses and damages resulting to the Contractor from such suspension. Work shall be resumed by the Contractor after such suspension on written notice from the DISTRICT.

c) In the event of any suspension of the Work in whole or in part under subsection (b) above, the Contractor shall be entitled to an extension of time wherein to complete the Work to the extent of the delay caused the Contractor thereby.

d) In the event the entire Work shall be suspended by order of the DISTRICT, as hereinabove provided, and shall remain so suspended for a period of sixty (60) consecutive calendar days, through no fault of the Contractor, and notice to resume the Work shall not have been served on the Contractor as hereinabove provided, Contractor may, at its option, by written notice to the DISTRICT, terminate the Contract in the same manner as if the termination had been initiated by the DISTRICT, and the DISTRICT shall have no claim for damages because of such termination of the Contract.

e) If, through no act or fault of the Contractor, the Work is suspended for a period of more than ninety (90) calendar days by the DISTRICT or under an order of Court or other public authority, or the Engineer fails to act on any request for payment within thirty (30) calendar days after it is submitted, or the DISTRICT fails to pay the Contractor substantially the sum approved by the Engineer or any final award by arbitration or litigation within sixty (60) calendar days of its approval and presentation, then the Contractor may, after ten (10) calendar days from delivery of a written notice to the DISTRICT and the Engineer, terminate the Contract and recover from the DISTRICT payment for all Work executed and all expenses sustained.

In addition and in lieu of terminating the Contract, if the Engineer has failed to act on a request for payment or if the DISTRICT has failed to make any payment as aforesaid, the Contractor may upon ten (10) calendar days written notice to the DISTRICT and the Engineer stop the Work until he has been paid all amounts then due, in which event and upon resumption of the Work, Change Orders shall be issued for adjusting the Contract Price or extending the Contract Time or both to compensate for the costs and delays attributable to the stoppage of the Work.

If the performance of all or any portion of the Work is suspended, delayed, or interrupted as a result of a failure of the DISTRICT or Engineer to act within the time specified in the Contract Documents, or if no time is specified, within a reasonable time, an adjustment in the Contract Price or an extension of the Contract Time, or both, shall be made by Change Order to compensate the Contractor for the costs and delays necessarily caused by the failure of the DISTRICT or Engineer.

If the Contractor intends to file a claim for additional compensation for a delay caused by the DISTRICT or Engineer at a particular time, the Contractor shall file a Notice of Claim with the DISTRICT within seven (7) calendar days of the beginning of the occurrence. The Notice of Claim shall be in duplicate, in writing, and shall state the circumstances and the reasons for the Claim, but need not state the amount. No Claim for additional compensation will be considered unless a Notice of Claim has been filed with the DISTRICT within the time and in the manner stated above. Contractor's failure to file a claim shall constitute a waiver.

B-37 Termination For Default - Damages For Delay - Timely Extension

a) The Contractor shall at all times employ such force, plant, materials, and tools as will be sufficient, in the opinion of the Engineer, to prosecute the Work at not less than the rates fixed under the terms of the Contract and to complete the Work or any part thereof within the time limits fixed therein. If the Contractor refuses or fails to prosecute the Work, or any separable part

thereof, with such diligence as will ensure the completion within the time specified in the Contract, or any extension thereof, or fails to complete said Work within such time, the DISTRICT may, after giving ten (10) calendar days written notice to the Contractor, terminate its right to proceed with the Work or such part of the Work as to which there has been delay.

b) The Contractor's right to proceed shall not be so terminated nor the Contractor charged with resulting damage if:

(i) The delay in the completion of the Work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to Acts of God, acts of the public enemy, acts of the DISTRICT, acts of another contractor in the performance of a Contract with the DISTRICT, fires, floods, excluding site flooding due to groundwater, epidemics, quarantine restrictions, unusually severe weather, as determined by the Engineer; and

(ii) The Contractor shall, within 48 hours of the start of the occurrence, give notice to the DISTRICT of the cause of the potential delay and an estimate of the possible time extension involved. The Contractor, within seven (7) calendar days from the beginning of any such delay (unless the Engineer grants further period of time before the date of final payment under the Contract), notifies the Engineer in writing of the causes of delay and requests an extension of time.

(iii) The Engineer shall ascertain the facts and the extent of the delay and extend the time for completing the Work when, in its judgment, the findings of fact justify such an extension, and its findings of fact shall be final and conclusive on the parties.

c) A request for an extension of time, or the granting of an extension of time, shall not constitute a basis for any claim against the DISTRICT for additional compensation or damages unless caused by the DISTRICT or another contractor employed by the DISTRICT.

d) If the Contractor should be adjudged bankrupt, or if it should make a general assignment for the benefit of its creditors, or if a receiver should be appointed for the Contractor on account of its insolvency and not be discharged within ten (10) calendar days after its appointment, or if the Contractor should fail to make prompt payments to Subcontractors or suppliers, or should it persistently disregard laws, ordinances, or the instructions of the Engineer, or otherwise commit a substantial violation of any provisions of the Contract, the DISTRICT may, after giving ten (10) calendar days written notice to the Contractor, terminate the Contract and the Contractor's right to proceed with the Work.

e) No extension of time will be considered for time lost due to weather conditions normal to the area. Unusual weather conditions, if determined by the Engineer to be of a severity that could not be predicted, may be considered as cause for an extension of Contract completion time.

f) Delays in delivery of equipment or material purchased by the Contractor or his Subcontractors shall not be considered as a just cause for delay. The Contractor shall be fully responsible for the timely ordering, scheduling, expediting delivery, and installation of all equipment and materials.

g) The rights and remedies of the DISTRICT provided in this section are in addition to any of the rights and remedies provided by law or under this Contract.

h) In addition to the DISTRICT's rights under this section, if at any time before completion of the work under the Contract, it shall be determined by the DISTRICT that reasons beyond the control of the parties hereto render it impossible or against the interests of the DISTRICT to complete the Work, or if the Work shall be stopped by an injunction of a court of competent jurisdiction or by order of any competent authority, the DISTRICT may, upon ten (10) calendar days written notice to the Contractor, discontinue the Work and terminate the Contract. Upon service of such notice of termination, the Contractor shall discontinue the Work in such manner, sequence, and at such

times as the Engineer may direct. The Contractor shall have no claim for damages for such discontinuance or termination, nor any claim for anticipated profits on the Work thus dispensed with, nor any other claim except for the Work actually performed up to the time of discontinuance, including any extra work ordered by the Engineer to be done, nor for any claim for liquidated damages in accordance with the provisions of Section B-39.

B-38 Rights of DISTRICT Upon Termination

a) In the event the right of the Contractor to proceed with the Work, or any portion thereof, has been terminated because of the fault of the Contractor and the Contractor has been given ten (10) calendar days' notice to cure such fault and has not done so, the DISTRICT may take over the Work and prosecute the same to completion by contract or any other method the DISTRICT deems expedient, and may take possession of and utilize in completing the Work such materials, appliances, equipment and plant as may be on the site of the Work and necessary therefor. Whether or not the Contractor's right to proceed with the Work is terminated, it and its sureties shall be liable for all damages including costs of managerial and administrative services, engineering, legal and other consultant fees, sustained or incurred by the DISTRICT in enforcing the provisions of Section B-37 and in completing or causing to complete the Contract Work.

b) Upon termination the Contractor shall not be entitled to receive any further payment until the Work is finished. If upon completion of the Work the total cost to the DISTRICT, including engineering, legal and other consultant fees, costs of managerial and administrative services, construction costs, and liquidated damages shall be less than the amount which would have been paid if the Work had been completed by the Contractor in accordance with the terms of the Contract, then the difference shall be paid to the Contractor in the same manner as the final payment under the Contract. If the total cost incurred by the DISTRICT on account of termination of the Contract and subsequent completion of the Work by the DISTRICT by whatever method the DISTRICT may deem expedient shall exceed said amount which the Contractor would otherwise have been paid, the Contractor and its sureties shall be liable to the DISTRICT for the full amount of such excess expense.

c) The rights and remedies of the DISTRICT provided in this section are in addition to any of the rights and remedies provided by the law or under this Contract.

B-39 Failure to Complete the Work in the Time Agreed Upon - Liquidated Damages

a) Liquidated Damages - It is agreed by the parties to the Contract that time is of the essence; and that in case all the Work is not completed before or upon the expiration of the time limit as set in the Bid, Contract and Progress Schedule, or within any time extensions that may have been granted, damage will be sustained by the DISTRICT; and that it may be impracticable to determine the actual amount of damage by reason of such delay; and it is, therefore, agreed that the Contractor shall pay to the DISTRICT as damages the amount of $2,000.00 per day for each and every day's delay in finishing the Work in excess of the number of days specified. The parties expressly agree that this liquidated damage clause is reasonable under the circumstances existing at the time the Contract was made. The DISTRICT shall have the right to deduct the amount of liquidated damages from any money due or to become due the Contractor.

b) In addition, the DISTRICT shall have the right to charge to the Contractor and to deduct from the final or progress payments for the Work the actual cost to the DISTRICT of legal, engineering, inspection, superintendence, and other expenses, which are directly chargeable to the Contract and which accrue during the period of such delay, except that the cost of final inspection and preparation of the final estimate shall not be included in the charges.

c) Exclusions - Notwithstanding the provisions of subsection (a), the Contractor shall not be liable for liquidated damages or delays caused by the removal or relocation of utilities when such

removal or relocation is the responsibility of the DISTRICT or the owner of the utility under Government Code Section 4215.

B-40 Clean-up

During the progress of the Work, the Contractor shall maintain the site and related structures and equipment in a clean, orderly condition and free from unsightly accumulation of rubbish. Upon completion of Work and before the final estimate is submitted, the Contractor shall at its own cost and expense remove from the vicinity of the Work all plants, buildings, rubbish, unused work materials, concrete forms, and temporary bridging and other like materials, belonging to it or used under its direction during the construction, and in the event of its failure to do so, the same may be removed by the DISTRICT after ten (10) calendar days' notice to the Contractor, such removal to be at the expense of the Contractor. Where the construction has crossed yards or driveways, they shall be restored by the Contractor to the complete satisfaction of the Engineer, at the Contractor's expense.

ARTICLE IV. LEGAL RELATIONS AND RESPONSIBILITY

B-41 Compliance with Laws - Permits, Regulations, Taxes

Contractor is an independent contractor and shall at its sole cost and expense comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the Work, obtain all necessary permits and licenses therefor, pay all manufacturers' taxes, sales taxes, use taxes, processing taxes, and all Federal and State taxes, insurance and contributions for social security and unemployment which are measured by wages, salaries or any remuneration paid to Contractor's employees, whether levied under existing or subsequently enacted laws, rules, or regulations. Contractor shall also pay all property tax assessments on materials or equipment used until acceptance by the DISTRICT. If any discrepancy or inconsistency is discovered in the Plans or Specifications, or in this Contract in relation to any such law, rule, ordinance, regulation, order or decree, the Contractor shall forthwith report the same to the Engineer in writing. It shall also protect and indemnify the DISTRICT, the Engineer, and all of the DISTRICT's officers, agents, and servants against any claim or liability arising from or based upon the violation of any such law, rule, ordinance, regulation, order or decree, whether by the Contractor itself or by its employees. Particular attention is called to the following:

a) Without limitation, materials furnished and performance by Contractor hereunder shall comply with Safety Orders of the Division of Industrial Safety, State of California, Federal Safety regulations of the Bureau of Labor, Department of Labor; and any other applicable Federal regulations.

The Contractor, upon request, shall furnish evidence satisfactory to the DISTRICT and Engineer that any or all of the foregoing obligations have been or are being fulfilled. The Contractor warrants to the DISTRICT that it is licensed by all applicable governmental bodies to perform this Contract and will remain so licensed throughout the progress of the Work, and that it has, and will have, throughout the progress of the Work, the necessary experience, skill and financial resources to enable it to perform this Contract.

Government code section references shall be interpreted to be the most recent applicable version.

B-42 Prevailing Wage

a) The Contractor shall forfeit as penalty to the DISTRICT the sum of Two Hundred Dollars ($200) for each calendar day or portion thereof for each worker (whether employed by the Contractor or Subcontractor) paid less than the stipulated prevailing rates for any Work done under the Contract in violation of the provisions of the Labor Code and in particular, Section 1775.

b) The DISTRICT will not recognize any claims for additional compensation because of the payment of the wages set forth in the Contract Documents. The possibility of wage increases is one of the elements to be considered by the Contractor in determining its proposal, and will not under any circumstances be considered as the basis of a claim against the DISTRICT or the Engineer.

c) The Contractor shall at all times keep posted at the jobsite current wage rates in effect for this Work.

d) This is a Public Works Project, and California State prevailing wage rates will be required on this project. The DISTRICT requires that all contractors and subcontractors working on this project keep certified payroll records in accordance with California Labor Code 1776 and submit copies to the DISTRICT.

(i) In accordance with the provisions of section 1720 et seq. of the Labor Code, the Division of Labor Standards and Research has determined the general prevailing rates or wages and employer payments for health and welfare, pension, vacation, travel time, and subsistence pay

as provided for in section 1773.8.

(ii) It shall be mandatory upon the Contractor herein and upon any Subcontractor to pay not less than the said specified rates to all laborers, workers and mechanics employed by them in the execution of the Agreement pursuant to CA Labor Code 1774.

(iii) Attention is directed to the provisions in section 1777.5 and sections 1777.6 of the Labor Code concerning the requirement to employ apprentices by the Contractor or any Subcontractor under it. The Contractor shall submit documentation to the DISTRICT confirming compliance with these requirements.

(iv) The Contractor shall comply with and shall cause his subcontractors to comply with all laws and regulations governing the contractor's and subcontractor's performance on this project including, but not limited to: anti-discrimination laws, workers' compensation laws, and prevailing wage laws as set forth in CA Labor Code, Sections 1720-1861 et seq. and licensing laws, as well as Federal Labor Standards set forth in the Davis-Bacon Act (40 USC 276(a-a5), the Copeland "Anti-Kickback" Act (40 USC 276(c); and the Contract Work Hours and Safety Standards Act (CWHSSA) (40 USC 327-333). The contractor is required to include the prevailing wage language in all subcontracts pursuant to CA Labor Code 1775(E)(b)(1). The Contractor shall post, at appropriate conspicuous points on the site of the Project, a schedule showing all the determined general prevailing wage rates.

(v) The Contractor agrees to comply with Labor Code Section 1775 (Payment of the Prevailing Wage Rates) and Labor Code 1776 (keeping accurate records) and Labor Code 1777.5, placing responsibility for compliance with the statutory requirements for all apprenticeable occupations on the prime contractor. The Contractor shall comply with the requirements imposed by the California Labor Code Sections 1720 through 1861 regarding public works projects and prevailing wage laws and sections 16000-16800 of the CA Code of Regulations.

(vi) Each worker needed to execute the work must be paid travel and subsistence payments as defined in the applicable collective bargaining agreements filed in accordance with Labor Code Section 1773.8.

(vii) Holiday and overtime work when permitted by law shall be paid for at a rate of at least one and one-half times the above specified rate of per diem wages, unless otherwise specified.

(viii) Contractors and any Subcontractors shall be assessed penalties for violating the following labor codes; CA Labor Code 1813 for overtime, 1775 for underpayment of the prevailing wage, and 1776 for inaccurate or incomplete payroll records.

B-43 Labor Compliance and Discrimination

Pursuant to Labor Code section 1771.4, the Contract for this Project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations.

a) On each job site that is subject to compliance monitoring and enforcement by the Department of Industrial Relations under this subchapter, the prime contractor shall post a Notice containing the following language:

"This public works project is subject to monitoring and investigative activities by the Division of Labor Standards Enforcement (DLSE), Department of Industrial Relations, State of California. This Notice is intended to provide information to all workers employed in the execution of the contract for public work and to all contractors and other persons having access to the job site to enable the DLSE to ensure compliance with and enforcement of prevailing wage laws on public works projects."

"The prevailing wage laws require that all workers be paid at least the minimum hourly wage as determined by the Director of Industrial Relations for the specific classification (or type of work) performed by workers on the project. These rates are listed on a separate job site posting of minimum prevailing rates required to be maintained by the public entity which awarded the public works contract. Complaints concerning nonpayment of the required minimum wage rates to

workers on this project may be filed with the DLSE."

Local Office Contact Information:

Telephone Number: 844-522-6734

Address: BOFE – Public Works
Attn: Complaints Unit
2031 2031 Howe Ave, Suite 100
Sacramento, CA 95825

"Complaints should be filed in writing immediately upon discovery of any violations of the prevailing wage laws due to the short period of time following the completion of the project that the DLSE may take legal action against those responsible."

"Complaints should contain details about the violations alleged (for example, wrong rate paid, not all hours paid, overtime rate not paid for hours worked in excess of 8 per day or 40 per week, etc.) as well as the name of the employer, the public entity which awarded the public works contract, and the location and name of the project."

"For general information concerning the prevailing wage laws and how to file a complaint concerning any violation of these prevailing wage laws, you may contact any DLSE office. Complaint forms are also available at the Department of Industrial Relations website found at www.dir.ca.gov/dlse/PublicWorks.html."

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

a) No discrimination shall be made in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status of such persons, except as provided in Section 12940 of the Government Code, and every Contractor for public works violating this section is subject to all the penalties imposed for a violation of this chapter.

Federal Equal Opportunity Clauses from 41 CFR 60 1.4(b) also apply. See Part 4 for detailed outline of Federal requirements. See Part 5 for required Non-discrimination Form.

B-44 Eight-Hour Day Limitation

a) In accordance with the provisions of the Labor Code, and in particular, Sections 1810 to 1815 thereof, inclusive, eight hours labor shall constitute a day's work, and no worker, in the employ of said Contractor, or any Subcontractor, doing or contracting to do any part of the Work contemplated by this Contract, shall be required or permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of those provisions; provided that subject to Labor Code Section 1815, a worker may perform work in excess of either eight (8) hours per day or forty (40) hours during any one week upon compensation for all hours worked in excess of eight (8) hours per day or forty (40) hours during any one week at not less than one and one-half times the basic rate of pay.

b) The Contractor and each Subcontractor shall also keep an accurate record showing the names, addresses, social security numbers, work classifications, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by the Contractor and by the Subcontractor in connection with the work specified herein, which record shall be open at all reasonable hours to the inspection of the DISTRICT, State and Federal officers and agents; and it is hereby further agreed that, except as

provided in (a) above, the Contractor shall forfeit as a penalty to the DISTRICT the sum of one hundred dollars ($100) for each worker employed in the performance of this Contract by it or by any Subcontractor under it for each calendar day during which such worker is required or permitted to labor more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of Sections 1810 through 1815.

B-45 Compliance with State Requirements for Employment of Apprentices

The Contractor's attention is directed to Section 1777.2 through 1777.5 of the Labor Code; provisions of those Sections pertaining to employment of registered apprentices are hereby incorporated by reference into these Specifications. As applicable, the Contractor or any Subcontractor employed by it in the performance of the Contract work shall take such actions as necessary to comply with the provisions of Section 1777.5. Contractor shall provide the DISTRICT copies of applicable forms or equivalent: DAS 140 – Public Works Contract Award Information; CAC2 – Training Fund Contributions; and any other communications relating to apprentices on public works projects. Contractor shall be solely liable for any and all fines assessed by the DIR or other agency or entity for non-compliance with any prevailing wage requirements.

B-46 Underground Utilities

In accordance with Government Code Section 4215, the Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating existing main or trunkline utility facilities not indicated in the Contract Plans and Specifications with reasonable accuracy, and for the equipment on the project necessarily idled during such work; provided that the Contractor shall first notify the Engineer before commencing work on locating, repairing damage to, removing or relocating such utilities.

B-47 Water Pollution

The Contractor shall exercise every reasonable precaution to protect streams, lakes, reservoirs, and other waters of the state and/or United States from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials and shall conduct and schedule its operations so as to avoid or minimize muddying and silting of said streams, lakes, reservoirs, and water bodies. Care shall be exercised to preserve vegetation beyond the limits of construction. The Contractor shall comply with Section 5650 of the California Fish and Wildlife Code, the National Pollution Discharge Elimination System (NPDES), State of California Construction General Permit, and all other applicable statutes and regulations relating to the prevention and abatement of water pollution.

B-48 Payment of Taxes

The Contract prices paid for the Work shall include full compensation for all taxes which the Contractor is required to pay, whether imposed by Federal, State, or local governments.

B-49 Permits and Licenses

Except as otherwise provided in this Contract, the Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the lawful prosecution of the Work.

Procurement procedures shall be in conformance with 2 CFR Section 200.320.

B-50 Patents

The Contractor shall pay all applicable royalties and license fees and assume all costs arising from the use of patented materials, equipment and devices. The Contractor shall defend all suits or claims for infringement of any patent rights and save the DISTRICT and Engineer and their duly authorized representatives harmless from loss on account thereof, except that the DISTRICT shall be responsible for

any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified; however if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Engineer.

B-51 Public Convenience

a) This section defines the Contractor's responsibility with regard to convenience of the public and public traffic in connection with its operations.

b) The Contractor shall so conduct its operations as to offer the least possible obstruction and inconvenience to the public and it shall have under construction no greater length or amount of work than it can prosecute properly with due regard to the rights of the public.

c) Unless otherwise provided in the Contract Documents, all public traffic shall be permitted to pass through the Work with as little inconvenience and delay as possible.

d) Spillage resulting from hauling operations along or across any publicly traveled way shall be removed immediately by the Contractor at the Contractor’s expense.

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

f) Convenient access to driveways, houses and buildings along the line of the Work shall be maintained and temporary approaches to crossings or intersecting highways shall be provided and kept in good condition. When the abutting property owner's access across the right-of-way line is to be eliminated, or to be replaced under the Contract by other access facilities, the existing access shall not be closed until the replacement access facilities are usable.

g) Water shall be supplied if ordered by the Engineer for the alleviation or prevention of dust nuisance as provided in the Contract Documents.

h) In order to expedite the passage of public traffic through or around the Work and where ordered by the Engineer, the Contractor shall install signs, lights, flares, barricades, and other facilities for the sole convenience and direction of public traffic. Also, where directed by the Engineer, the Contractor shall provide and station competent flagpersons whose sole duties shall consist of directing the movement of public traffic through or around the Work. The cost of furnishing and installing such signs, lights, flares, barricades, and other facilities, and the cost of providing and stationing such flagpersons, all for the convenience and direction of public traffic, will be considered as included in the Contract price and no additional compensation will be allowed.

i) Flagpersons and guards, while assigned to traffic control, shall perform their duties and shall be provided with the necessary equipment in accordance with the current "Instructions to Flagmen" of the California Department of Transportation. The equipment shall be furnished and kept clean and in good repair by the Contractor at its expense.

B-52 Safety

a) General - The Contractor shall be solely and completely responsible for the conditions of the job site, including safety of all persons and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to all applicable Federal, State, and local laws, ordinances, and codes, and to the rules and regulations established by the California Division of Industrial Safety, and to other rules of law applicable to the Work.

b) The services of the Engineer in conducting construction review of the Contractor's performance is

not intended to include review of the adequacy of the Contractor's work methods, equipment, bracing or scaffolding or safety measures, in, on, or near the construction site, and shall not be construed as supervision of the actual construction nor make the Engineer or the DISTRICT responsible for providing a safe place for the performance of work by the Contractor, Subcontractors, or suppliers; or for access, visits, use work, travel or occupancy by any person.

c) The Contractor shall carefully instruct all personnel working in potentially hazardous work areas as to the potential dangers and shall provide such necessary safety equipment and instruction as is necessary to prevent injury and damage to property. The Contractor shall appoint for the duration of this Contract, a qualified supervisor employee to develop and/or supervise the Contractor's job safety program that will effectively implement the safety provisions of the above agencies.

d) The Contractor, as a part of its safety program, shall maintain at its office or other well-known place at the job site, safety equipment applicable to the Work as prescribed by the aforementioned authorities, all articles necessary for giving first aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons (including employees) who may be injured on the job site.

e) If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Engineer and the DISTRICT. In addition, the Contractor must promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with, the performance of the Work whether on, or adjacent to, the site, giving full details and statements of witnesses.

f) If any claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

g) All work and materials shall be in strict accordance with all applicable State, Federal, and local laws, rules, regulations, and codes.

h) Nothing in this Contract is to be construed to permit work not conforming to governing law. When Contract Documents differ from governing law, the Contractor shall furnish and install the higher standards called for without extra charge. All equipment furnished shall be grounded and provided with guards and protection as required by safety codes. Where vapor-tight or explosion-proof electrical installation is required by law, this shall be provided.

i) Shoring and Trench Safety Plan - Attention is directed to Section 832 of the Civil Code of the State of California relating to lateral and subjacent support, and the Contractor shall comply with this law.

j) Trenching and Worker Protection - In accordance with Section 6705 of the State Labor Code, the Contractor shall submit to the DISTRICT specific plans to show details of provisions for worker protection from caving ground. Not less than thirty (30) calendar days before beginning excavation for any trench or trenches five (5) feet or more in depth required under this Contract, the Contractor shall furnish to the Engineer working drawings of its trench safety plan. The trench safety plan working drawings shall be detailed plans showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground. If such plan varies from the shoring system standards established by the Construction Safety Orders of the California Department of Industrial Relations or the Federal Safety and Health Regulations for Construction of the Occupational Safety and Health Administration, Department of Labor, the plan shall be prepared by a registered civil or structural engineer. In no event shall the Contractor use a shoring, sloping, or protective system less effective than that required by said Construction Safety Orders, or less effective than that required by said Federal Safety and Health Regulations

for Construction. Submission of this plan in no way relieves the Contractor from the requirement to maintain safety in all operations performed by it or its Subcontractors.

k) Hazardous Wastes and Unforeseen Conditions - In accordance with Section 7104 of the State Public Contract Code, if the Work contemplated hereunder involves digging trenches or other earthwork activities, the Contractor shall promptly, and before the following conditions are disturbed, notify the DISTRICT, in writing, of any: (i) material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law; (ii) Subsurface or latent physical conditions at the site differing from those indicated; or (iii) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract. The DISTRICT shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work shall issue a change order under the procedures described herein. In the event that a dispute arises between the DISTRICT and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for herein, but shall proceed with all Work to be performed hereunder. The Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the DISTRICT and Contractor.

l) The Contractor shall perform all Work in a fire-safe manner. The Contractor shall supply and maintain onsite adequate firefighting equipment capable of extinguishing incipient fires. The Contractor shall comply with applicable Federal, State, and local fire prevention regulations and where the regulations do not cover, with applicable parts of the National Fire Prevention Standard for "Safeguarding Building Construction Operations," (NFPA No. 241).

B-53 Protection of Person and Property

a) The Contractor shall take whatever precautions are necessary to prevent damage to all existing improvements, including above ground and underground utilities, trees, shrubbery that is not specifically shown to be removed, fences, signs, mailboxes, survey markers and monuments, buildings, structures, the DISTRICT's property, adjacent property, and any other improvements or facilities within or adjacent to the Work. If such improvements or property are injured or damaged by reason of the Contractor's operations, they shall be replaced or restored, at the Contractor's expense, to a condition at least as good as the condition they were in prior to the start of the Contractor's operations.

b) The Contractor shall adopt all practical means to minimize interference to traffic and public inconvenience, discomfort or damage. The Contractor shall protect against injury any pipes, conduits or other structures, crossing the trenching or encountered in the Work and shall be responsible for any injury done to such pipes or structures, or damage to property resulting therefrom. The Contractor shall support or replace any such structures without delay and without any additional compensation to the entire satisfaction of the Engineer. All obstructions to traffic shall be guarded by barriers illuminated at night. The Contractor shall be responsible for all damage to persons and property directly or indirectly caused by its operations and, under all circumstances, the Contractor must comply with the laws and regulations of the County and the State of California relative to safety of persons and property and the interruption of traffic and the convenience of the public within the respective jurisdictions.

c) The Contractor is cautioned that it must replace all improvements in rights-of-way and within the public streets to a condition equal to what existed prior to the Contractor's entry onto the job.

d) Type and time of construction required at any road subject to interference by Contract work will be determined by those authorities responsible for maintenance of said road. It shall be the responsibility of the Contractor to determine the nature and extent of all such requirements, including provision of temporary detours as required. As required at any road crossing, the Contractor shall provide all necessary flagpersons, guardrails, barricades, signals, warning signs and lighting to provide for the safety of existing roads and detours. Immediately after the need for temporary detours ceases, or when directed, the Contractor shall remove such detours and perform all necessary cleanup work, including replacement of fences, and removal of pavement. Included shall be all necessary replacement of existing roadway appurtenances, grading work, soil stabilization and dust control measures, as required and directed. The cost of all work specified under this Section shall be borne by the Contractor.

e) The Contractor shall examine all bridges, culverts, and other structures over which it will move its materials and equipment, and before using them, it shall properly strengthen such structures where necessary. The Contractor shall be responsible for any and all injury or damage to such structures caused by reason of its operations.

B-54 Responsibility for Repair of Facilities

All public or private facilities, including but not limited structures, telephone cables, roadways, parking lots, private drives, levees and embankments disturbed during construction of the Work shall be repaired and/or replaced by the Contractor to match facilities existing prior to construction. In addition, the Contractor shall be responsible for any settlement damage to such facilities or adjoining areas for a period of one year after acceptance of such required facilities.

B-55 Resolution of Construction Claims

a) For any claim arising under this Contract, the following procedures will apply:

(i) The claim must be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the day of final payment. Nothing in this subsection is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth elsewhere in this Contract.

(ii) The parties shall attempt to resolve the claim according to procedures outlined in Public Contract Code § 9204.

b) The Contractor shall proceed with the Work in accordance with the Plans and Specifications and determinations and instructions of the Engineer during the resolution of any claims disputes.

B-56 DISTRICT's Repair

In the event the Contractor refuses or neglects to make good any loss or damage for which the Contractor is responsible under this Contract, the DISTRICT may itself, or by the employment of others, make good any such loss or damage, and the cost and expense of doing so, including any reasonable engineering, legal and other consultant fees, and any costs of administrative and managerial services, shall be charged to the Contractor. Such costs and expenses may be deducted by the DISTRICT from claims for payment made by the Contractor for Work completed or remaining to be completed.

B-57 Antitrust Claim Assignment

In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to this Contract, the Contractor and all subcontractors shall offer and agree to assign to the DISTRICT all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials

pursuant to the public works contract or subcontract. This assignment shall be made and become effective at the time the DISTRICT tenders final payment to the Contractor, without further acknowledgement by the parties.

B-58 Waiver of Right to Rescind For Material Breach

The Contractor agrees that it can be adequately compensated by money damages for any breach of this Contract which may be committed by the DISTRICT and hereby agrees that no default, act, or omission of the DISTRICT or the Engineer, except for failure to make progress payments as a required by Section B-67, shall constitute a material breach of the Contract entitling the Contractor to cancel or rescind the provisions of this Contract or (unless the DISTRICT shall so consent or direct in writing) to suspend or abandon performance of all or any part of the Work. The Contractor hereby waives any and all rights and remedies to which it might otherwise be or become entitled, save only its right to money damages.

B-59 Contractor's License Notice

Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors of a complaint if filed within three (3) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, 9835 Goethe Road, Sacramento, California. Mailing address: P.O. Box 26000, Sacramento, California 95826.

ARTICLE V. INSURANCE AND LIABILITY

B-60 Insurance

a) Neither the Contractor nor any Subcontractors shall commence any work until all required insurance has been obtained at their own expense. Such insurance must have the approval of the DISTRICT as to limit, form, and amount, and shall be placed with insurers with a current A.M. Best's rating of no less than A-:VII.

b) Any insurance bearing on adequacy of performance shall be maintained after completion of the project for the full guarantee period.

c) Prior to execution of the Contract, the Contractor shall furnish the DISTRICT with original endorsements effecting coverage for all policies required by the Contract. The Contractor shall not permit any Subcontractor identified in the Designation of Subcontractors form to commence work on this project until such Subcontractor has furnished the DISTRICT with original endorsements effecting coverage for all insurance policies required by the Contract. The endorsements shall be signed by a person authorized by the insurer to bind coverage on its behalf. The Contractor's insurer shall provide complete, certified copies of all required insurance policies, including endorsements affecting the coverage required by this paragraph. The Contractor agrees to furnish one copy of each policy to the DISTRICT, and additional copies as requested in writing, certified by an authorized representative of the insurer.

d) All of the Contractor's policies shall contain an endorsement providing that written notice shall be given to the DISTRICT at least sixty (60) calendar days prior to termination, cancellation, or reduction of coverage in the policy.

e) Any policy or policies of insurance that the Contractor elects to carry as insurance against loss or damage to its construction equipment and tools shall include a provision therein providing a waiver of the insurer's right to subrogation against the DISTRICT and the Engineer.

f) The requirements as to the types, limits, and the DISTRICT's approval of insurance coverage to be maintained by the Contractor are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under the Contract.

g) In addition to any other remedy the DISTRICT may have, if the Contractor or any of the Subcontractors fails to maintain the insurance coverage as required in this Section, the DISTRICT may obtain such insurance coverage as is not being maintained, in form and amount substantially the same as required herein, and the DISTRICT may deduct the cost of such insurance from any amounts due or which may become due the Contractor under this Contract.

h) The Contractor and all Subcontractors shall, at their expense, maintain in effect at all times during the performance of work under the Contract not less than the following coverage and limits of insurance, which shall be maintained with insurers and under forms of policy satisfactory to the DISTRICT. The maintenance by the Contractor and all Subcontractors of the following coverage and limits of insurance is a material element of this Contract. The failure of the Contractor or any Subcontractor to maintain or renew coverage or to provide evidence of renewal may be treated by the DISTRICT as a material breach of this Contract.

(i) Worker's Compensation and Employer's Liability Insurance.

a. Worker's Compensation – The Contractor shall Provide, during the life of this Contract, workers' compensation insurance for all of the employees engaged in Work under this Contract, on or at the Project site, and, in case any of sublet Work, the Contractor shall require each subcontractor similarly to provide workers' compensation insurance for all the latter's employees as prescribed by State law. Any class of employee or employees not

covered by a subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in work under this Contract, on or at the Project site, is not protected under the Workers' Compensation Statutes, the Contractor shall provide or shall cause a subcontractor to provide, adequate insurance coverage for the protection of such employees not otherwise protected. The Contractor is required to secure payment of compensation to his employees in accordance with the provisions of Section 3700 of the Labor Code. The Contractor shall file with the DISTRICT certificates of its insurance protecting workers and shall provide certificates at any time upon request. Company or companies providing insurance coverage shall be acceptable to the DISTRICT, if in the form and coverage as set forth in the Contract Documents.

b. Contractor shall assume the immediate defense of and indemnify and save harmless the DISTRICT and its officers and employees, agents, and consultants from all claims, loss, damage, injury, and liability of every kind, nature, and description brought by any person employed or used by Contractor, or any subcontractor, to perform the Work under this contract regardless of responsibility or negligence. Contractor hereby agrees to waive rights of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. Contractor agrees to obtain any endorsement that may be necessary to effect this waiver of subrogation. The Workers' Compensation Policy shall be endorsed with a waiver of subrogation in the favor of the DISTRICT for all work performed by the Contractor, its employees, agents and subcontractors.

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

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

(iii) Commercial General Liability and Automobile Liability Insurance - the Contractor shall provide and maintain the following commercial general liability and automobile liability insurance:

a. Coverage – coverage for commercial general liability and automobile liability insurance shall be at least as broad as the following:
   i. Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 0001)
   ii. Insurance Services Office (ISO) Business Auto Coverage (Form CA 0001), covering Symbol 1 (any auto)

b. Limits – the Contractor shall maintain limits no less than the following:
   i. General Liability - Five million dollars ($5,000,000) per occurrence or the full per occurrence limits of the policies available, whichever is greater for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit or products-completed operations aggregate limit is used, either the general aggregate limit shall apply separately to the project/location (with the ISO CG 2503, or ISO CG 2504, or insurer's equivalent endorsement provided to DISTRICT) or the general aggregate limit and products-completed operations aggregate limit shall be twice the required occurrence limit.
   ii. Automobile Liability - One million dollars ($1,000,000) for bodily injury and property damage each accident limit.

c. Required Provisions - the general liability, auto liability and excess liability policies are to contain, or be endorsed to contain, the following provisions:
    i. The DISTRICT, its directors, officers, employees, and authorized volunteers are to be given insured status at least as broad as ISO endorsement CG 2010 11 85; or both CG 20 10 10 01 and CG 20 37 04 13 (or the CG 20 10 04 13 (or earlier edition date) specifically naming all of the DISTRICT parties required in this agreement, or using language that states “as required by contract”). All Subcontractors hired by Contractor must also have the same forms or coverage at least as broad; as respects (via CG 20 38 04 13): liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor; and automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the DISTRICT, its directors, officers, employees, or authorized volunteers.
    ii. It is understood and agreed to by the parties hereto and the insurance company(s), that the Certificate(s) of Insurance and policies shall so covenant and shall be construed as primary, and the DISTRICT insurance and/or deductibles and/or self-insured retentions or self-insured programs shall not be construed as contributory using the ISO endorsement CG 20 01 04 13 or coverage at least as broad.
    iii. Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the DISTRICT, its directors, officers, employees, or authorized volunteers.
    iv. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
    v. Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the DISTRICT.
d. Such liability insurance shall indemnify the Contractor and his/her sub-contractors against loss from liability imposed by law upon, or assumed under contract by, the Contractor or his/her sub-contractors for damages on account of such bodily injury (including death), property damage, personal injury, completed operations, and products liability.
e. The general liability policy shall cover bodily injury and property damage liability, owned and non-owned equipment, blanket contractual liability, completed operations liability, explosion, collapse, underground excavation, and removal of lateral support.
f. The automobile liability policy shall cover all owned, non-owned, and hired automobiles.
g. All of the insurance shall be provided on policy forms and through companies satisfactory to the DISTRICT.
h. The comprehensive general and automobile liability insurance coverage shall also include the following:
    i. Provision or endorsement naming the DISTRICT, the Engineer and its consultants, and each of their officers, employees, and agents, each as additional insureds in regards to liability arising out of the performance of any work under the Contract and providing that such insurance is primary insurance as respects the interest of the DISTRICT and Engineer and that any other insurance maintained by the DISTRICT and Engineer is excess and not contributing insurance with the insurance required hereunder.
    ii. "Cross Liability" or "Severability of Interest" clause.
    iii. Provision or endorsement stating that such insurance, subject to all of its other terms and conditions, applies to the liability assumed by the Contractor under the Contract, including, without limitation, that set forth in Section B-61, Indemnity and Litigation Costs.
    iv. Provision or endorsement stating that any failure to comply with reporting or

other provisions of the policies including breaches of warranties shall not affect coverage provided to the DISTRICT, its officers, officials, employees, or volunteers.

i) Deductibles and Self-Insured Retentions - Insurance deductibles or self-insured retentions must be declared by the Contractor, and such deductibles and retentions shall have the prior written consent from the DISTRICT. At the election of the DISTRICT the Contractor shall either 1) reduce or eliminate such deductibles or self-insured retentions, or 2) procure a bond which guarantees payment of losses and related investigations, claims administration, and defense costs and expenses. 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 or additional insureds, co-insurers, and/or insureds other than the First Named Insured.

j) Acceptability of Insurers - Any insurance carrier providing insurance coverage required by the Contract Documents shall be admitted to and authorized to do business in the State of California unless waived, in writing, by the DISTRICT Risk Manager. Carrier(s) shall have an A.M. Best rating of not less than an A-: VII or better.

k) Responsibility for Work - Until the completion and final acceptance by the DISTRICT of all the work under and implied by this agreement, the work shall be under the Contractor's responsible care and charge. The Contractor shall rebuild, repair, restore and make good all injuries, damages, re-erections, and repairs occasioned or rendered necessary by causes of any nature whatsoever.

a. The Contractor shall provide and maintain builder's risk insurance (or installation floater) covering all risks of direct physical loss, damage or destruction to the work in the amount specified in the General Conditions, to insure against such losses until final acceptance of the work by the DISTRICT. Such insurance shall insure at least against the perils of fire and extended coverage, theft, vandalism and malicious mischief, and collapse. The DISTRICT, its directors, officers, employees, and authorized volunteers shall be named insureds on any such policy. The making of progress payments to the Contractor shall not be construed as creating an insurable interest by or for the DISTRICT or be construed as relieving the Contractor or his/her subcontractors of responsibility for loss from any direct physical loss, damage or destruction occurring prior to final acceptance of the work by the DISTRICT.

b. The Contractor shall waive all rights of subrogation against the DISTRICT, its directors, officers, employees, or authorized volunteers.

l) Evidences of Insurance - Prior to execution of the agreement, the Contractor shall file with the DISTRICT a certificate of insurance (Acord Form 25 or equivalent) signed by the insurer's representative evidencing the coverage required by this agreement. Such evidence shall include an additional insured endorsement signed by the insurer's representative and evidence of waiver of rights of subrogation against the DISTRICT (if builder's risk insurance is applicable). Such evidence shall also include (1) attached additional insured endorsements with primary & non-contributory wording, (2) Workers' Compensation waiver of subrogation, and (3) a copy of the CGL declarations or endorsement page listing all policy endorsements, and confirmation that coverage includes or has been modified to include Required Provisions 1-5 above. The DISTRICT reserves the right to obtain complete, certified copies of all required insurance policies, at any time. Failure to continually satisfy the Insurance requirements is a material breach of contract.

m) Continuation of Coverage - The Contractor shall, upon demand of the DISTRICT deliver evidence of coverage showing continuation of coverage for at least (10) years after completion of the project. Contractor further waives all rights of subrogation under this agreement. When any of the required coverages expire during the term of this agreement, the Contractor shall deliver the renewal certificate(s) including the general liability additional insured endorsement and evidence of waiver of rights of subrogation against the DISTRICT (if builder's risk insurance is applicable) to the

DISTRICT at least ten (10) days prior to the expiration date.

n) Subcontractors - In the event that the Contractor employs other contractors (Subcontractors) as part of the work covered by this agreement, it shall be the Contractor's responsibility to require and confirm that each sub-contractor meets the minimum insurance requirements specified above. The Contractor shall, upon demand of the DISTRICT, deliver to the DISTRICT copies such policy or policies of insurance and the receipts for payment of premiums thereon.

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

p) The DISTRICT reserves the right to modify these insurance requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage or other circumstances.

B-61 Indemnity and Litigation Cost

a) Promptly upon execution of the Contract, the Contractor specifically obligates itself and hereby agrees to protect, hold free and harmless, defend and indemnify the DISTRICT, the Engineer and its consultants, and each of their officers, officials, employees and agents, from and against any and all liability, penalties, costs, losses, damages, expenses, causes of action, claims or judgments, including without limitation attorneys' fees and other costs of litigation, which arise out of or are in any way connected with the Contractor's, or its Subcontractors' or suppliers', performance of Work under this Contract or failure to comply with any of the obligations contained in the Contract. This indemnity shall not extend, however, to attorney fees and costs incurred by the DISTRICT in prosecuting or defending against the Contractor in any proceeding under Section B-8, and shall imply no reciprocal right of the Contractor in any action on the contract pursuant to California Civil Code section 1717 or section 1717.5. To the extent legally permissible, this indemnity and hold harmless agreement by the Contractor shall apply to any acts or omissions, whether active or passive, on the part of the Contractor or its agents, employees, representatives, or Subcontractor's agents, employees and representatives, resulting in liability, irrespective of whether or not any acts or omissions of the parties to be indemnified hereunder may also have been a contributing factor to the liability, except such loss or damage which was caused by the active negligence, sole negligence or willful misconduct of the DISTRICT.

b) In any and all claims against the DISTRICT or the Engineer and its consultants, and each of their officers, employees and agents by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this Section shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under Worker's Compensation statutes, disability benefit statutes or other employee benefit statutes.

c) Each party to this Contract has been represented by counsel in the negotiation and execution of this Contract.

B-62 Protection of Work

a) The Contractor shall be responsible for the care of all work until completion and final acceptance; and the Contractor shall, at its own expense replace damaged or lost material and repair damaged parts of the Work or the same may be done at the Contractor's expense by the DISTRICT and the Contractor and its sureties shall be liable therefore. The Contractor shall make its own provisions for properly storing and protecting all material and equipment against theft, injury, or damage from any and all causes. Damaged material and equipment shall not be used in the Work. The Contractor shall take all risks from floods and casualties except as provided by law, and shall make no charge for the restoration of such portions of the Work as may be destroyed or damaged

by flood or other casualties or because of danger from flood or other casualties or for delays from such causes. The Contractor may, however, be allowed a reasonable extension of time on account of such delays, subject to the conditions hereinbefore specified. The Contractor shall not be responsible for the cost, in excess of five percent (5%) of the contracted amount, of repairing or restoring damage to the Work, if the damage was proximately caused by an earthquake in excess of a magnitude of 3.5 on the Richter Scale or by tidal waves; provided that the Work damaged was built in accordance with accepted and applicable building standards, and the Plans and Specifications of the DISTRICT.

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

c) The Contractor shall use extreme care during construction to prevent damage from dust to crops and adjacent property. The Contractor, at its own expense, shall provide adequate dust control for the right-of-way and take other preventive measures as directed by the Engineer.

d) The Contractor shall be responsible for all damage to any property resulting from trespass by the Contractor or its employees in the course of their employment, whether such trespass was committed with or without the consent or knowledge of the Contractor.

e) The Contractor shall see that the work site is kept drained and free of all ground water and any other water which may impede the progress or execution of the Contract work.

f) The Contractor shall be responsible for any damage caused by drainage or water runoff from construction areas and from construction plant areas. In an emergency affecting the safety of life, or of the Work, or of adjoining property, the Contractor, without special instruction or authorization from the Engineer, is hereby permitted to act at the Contractor's discretion to prevent such threatened loss or injury, and it shall so act without appeal if so instructed or authorized. Any compensation claimed by the Contractor on account of emergency work shall be determined as specified under Section B-3. Should the Engineer deem an emergency condition to exist, the Contractor shall immediately do those things and take those steps ordered by the Engineer. The decision of the Engineer in this respect shall be final and conclusive. Any claims for compensation made by the Contractor on account of emergency work shall be determined as specified under Section B-3.

g) Except as provided by Government Code Section 4215, the Contractor shall be responsible for the removal, relocation and protection of all public and private utilities, including irrigation facilities in the nature of utilities, located on the site of the construction project if and to the extent that the same are identified in the Contract Documents, and the Contractor shall not be entitled to any extension of time or claim for damages for extra compensation in connection therewith. If and to the extent that such utilities or facilities are not identified in the Contract Documents, as between

the Contractor and the DISTRICT, the DISTRICT will be responsible for the cost of their removal, relocation or protection, as the case may be, but the Contractor shall perform any such work in conformance with applicable provisions of Sections B-3 and B-4, if so directed by the Engineer and in such situation the Contractor shall not be responsible for delay in completion of the project caused by the failure of the DISTRICT or the owner of the utility to provide for such removal or relocation. If the Contractor, while performing the Contract, discovers utility or irrigation facilities not identified by the DISTRICT in the Contract Documents, it shall immediately notify the Engineer in writing.

h) Subject to the provisions of this Section, where the Work to be performed under the Contract crosses or otherwise interferes with existing streams, watercourses, canals, farm ditches, pipelines, drainage channels, or water supplies, the Contractor shall provide for such watercourse or pipelines and shall perform such construction during the progress of the Work so that no damage will result to either public or private interests, and the Contractor shall be liable for all damage that may result from failure to so provide during the progress of the Work.

B-63 No Personal Liability

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

ARTICLE VI. MEASUREMENT AND PAYMENT

B-64 Measurement of Quantities

a) Where the Contract provides for payment on a lump sum price basis, the Contractor shall submit a price breakdown to the Engineer immediately after award of the Contract. The price breakdown as agreed upon between the Contractor and the Engineer shall be used for preparing future estimates for partial payments to the Contractor and shall list the major items of Work and a price for each item. Overhead and other general costs and profit shall be prorated to each item so that the total of all items equals the lump sum price. The price breakdown shall be subject to the approval of the Engineer and Contractor may be required to verify the prices for any or all items.

Where the Contract provides for payment on a unit price basis, the quantities of work performed will be computed by the Engineer on the basis of measurements taken by the Engineer.

b) Whenever the estimated quantities of Work to be done and materials to be furnished under this Contract are shown in any of the documents including the Proposal, they are given for use in comparing bids and the right is especially reserved, except as herein or otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the DISTRICT to complete the Work contemplated by this Contract and such increase or diminution shall in no way violate this Contract, nor shall any such increase or diminution give cause for claims, liability for damage or adjustment to the Contract time or bid price.

B-65 Scope of Payment

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

b) No compensation will be made in any case for loss of anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as provided in such agreements.

B-66 Progress Estimate

At the end of each month where work was performed, the Contractor will submit to the Engineer a partial payment estimate filled out and signed by the Contractor covering the Work performed during the period covered by the partial pay estimate and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the DISTRICT, as will establish the DISTRICT'S title to the material, and equipment and protect its interest therein, including, applicable insurance. The Engineer will within seven (7) calendar days after receipt of each partial payment estimate either recommend payment to the DISTRICT or return the estimate to the Contractor indicating in writing its reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial pay estimate.

Payroll certification forms provided by the Contractor and fully executed shall be filed with the Engineer at the time of submission of each partial payment estimate and also when the claim for final payment is

submitted. Wage Report forms shall be completed and submitted as set forth in Parts 4 and 5.

B-67 Progress Payments

a) The Contractor is made aware that the DISTRICT is responsible for approving all partial payments.

b) Upon receipt of an undisputed, properly submitted progress estimate from the Contractor, recommended by the Engineer, the DISTRICT shall act in accordance with the following:

(i) Each payment request shall be reviewed by the DISTRICT as soon as practicable after receipt for the purpose of determining that the progress estimate is a proper payment request.

(ii) Any payment request determined not to be a proper payment request suitable for payment shall be returned to the Contractor as soon as practicable but not later than seven (7) calendar days after receipt. A request returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.

c) The number of days available to the DISTRICT to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which the DISTRICT exceeds the ten-day return requirement set forth herein.

d) The DISTRICT will pay the Contractor ninety-five percent (95%) of the amount of each progress estimate within sixty (60) calendar days after receipt of an undisputed, properly submitted progress estimate from the Contractor, recommended by the Engineer. If the DISTRICT fails to pay an undisputed progress estimate within the allotted sixty (60) calendar days, the DISTRICT shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (s) of Section 685.010 of the Code of Civil Procedures. Five percent (5%) of each estimate shall be retained by the DISTRICT until final completion and acceptance of all Work under Contract.

e) When, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the Contract, or when in the Engineer's judgment the total amount of the work done since the last estimate amounts to less than $1,000, no pay estimate will be prepared and no progress payment will be made.

f) No progress estimate or payment shall be considered to be an approval or acceptance of any work, materials, or equipment. Estimated amounts and values of work done and materials and equipment furnished will be confirmed with actual amounts and values as they become available in subsequent progress estimates, progress payments and the final estimate and payment. All estimates and payments will be subject to correction in subsequent progress estimates and payments and the final estimate and payment.

g) The DISTRICT requires that any payments due to Subcontractors for a portion of the Work satisfactorily completed shall be made by Contractor to Subcontractors within thirty (30) calendar days of DISTRICT's payment to Contractor. Failure to make such payments in a timely fashion may result in the DISTRICT issuing future progress payments by joint check to the Contractor and Subcontractors.

h) It is mutually agreed between the parties to the Contract that no payments made under the Contract, including progress payments and the final payment, shall be evidence of the performance of the Contract, either wholly or in part, and no payment shall be construed to be an acceptance of any defective or incomplete work or improper materials.

B-68 Liens and Stop Notices

The Contractor agrees to keep the Work, the site of the Work and all monies held by the DISTRICT free and clear of all liens and stop notices related to labor and materials furnished in connection with the

Work, if permitted by law. Furthermore, the Contractor waives any right it may have to file any type of lien or stop notice in connection with the Work. Notwithstanding anything to the contrary contained in the Contract documents, if any such lien or stop notice is filed or there is evidence to believe that lien or stop notice may be filed at any time during the progress of the Work or within the duration of this Contract, the DISTRICT may refuse to make any payment otherwise due the Contractor or may withhold any payment due the Contractor a sum sufficient in the opinion of the DISTRICT to pay all obligations and expenses necessary to satisfy such lien or stop notice. The DISTRICT may withhold such payment unless or until the Contractor, within ten (10) calendar days after demand therefor by the DISTRICT, shall furnish satisfactory evidence that the indebtedness and any lien or stop notice in respect thereof has been satisfied, discharged and released of record, or that the Contractor has legally caused such lien or stop notice to be released of record pending the resolution of any dispute between the Contractor and any person or persons filing such lien or stop notice. If the Contractor shall fail to furnish such satisfactory evidence within ten days of the demand therefor, the DISTRICT may discharge such indebtedness and deduct the amount thereof, together with any and all losses, costs, damages and attorney's fees suffered or incurred by the DISTRICT from any sum payable to the Contractor under the Contract documents, including but not limited to final payment and retained percentage. This Section shall be specifically included in all Subcontracts and purchase orders entered into by the Contractor.

B-69 Final Acceptance and Date of Completion

Whenever the Contractor shall deem all Work under this Contract to have been completed in accordance therewith, it shall so notify the Engineer in writing, and the Engineer shall promptly ascertain whether the Work has been satisfactorily completed and, if not, shall advise the Contractor in detail and in writing of any additional work required. When all the provisions of the Contract have been fully complied with to the satisfaction of the Engineer, the Engineer shall proceed with all reasonable diligence to determine accurately the total value of all Work performed by the Contractor at the prices set forth in the Contract or fixed by Change Orders, and the total value of all extra work, all in accordance with the Contract. The Engineer will then certify to said final estimate and to the completion of the Work, and will file copies thereof with the DISTRICT and the Contractor. The date of completion shall be the date upon which the DISTRICT makes its formal written acceptance of the Work.

B-70 Final Payment

Within ten (10) calendar days after the date of completion, the DISTRICT will file in the Office of the County Recorder, a Notice of Completion of the Work herein agreed to be done by the Contractor. On the expiration of thirty-five (35) calendar days after the recordation of such Notice of Completion the difference between said final estimate and all payments theretofore made to the Contractor shall be due and payable to the Contractor, subject to any requirements concerning the furnishings of a maintenance bond, and excepting only such sum or sums as may be withheld or deducted in accordance with the provisions of this Contract. All prior certifications upon which partial payments may have been made, being merely estimates, shall be subject to correction in the final certificate.

B-71 Final Release

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

WAIVER AND RELEASE UPON FINAL PAYMENT

The undersigned has been paid in full by the McKinleyville Community Services District (District) for all labor, services, equipment and material furnished to the District for the Central Avenue Water & Sewer Rehabilitation Project located in Humboldt County, California, and does hereby waive and release the District, its officers, agents, and employees, from all claims and liability to the Contractor arising out of, or in any way connected with, the Contract, except for the disputed contract claims specified below:

Notice of Disputed Claim

Amount of Claim

$_____

Dated: _____ _____
(Name of Contractor)

By: _____
(Title)

Any payment, however, final or otherwise shall not release the Contractor or its sureties from obligations under the Contract Documents or Performance and Payment Bonds.

B-72 Right to Withhold Payments

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

(i) Defective work not remedied, irrespective of when any such work be found to be defective;
(ii) Claims or liens filed or reasonable evidence indicating probable filing of claims or liens including, but not limited to claims under Sections 1775, 1776, or 1777.7 of the Labor Code;
(iii) Failure of the Contractor to make payments properly for labor, materials, equipment, or other facilities, or to Subcontractors and/or suppliers;
(iv) A reasonable doubt that the Work can be completed for the balance then unearned;
(v) A reasonable doubt that the Contractor will complete the Work within the agreed time limits;
(vi) Costs to the DISTRICT resulting from failure of the Contractor to complete the Work within the proper time; or
(vii) Damage to Work or property.
(viii) Damage to another Contractor.
(ix) Performance of Work in violation of the Terms of the Contract Documents.
(x) Where work on unit items is substantially complete, but lacks cleanup and/or other corrections ordered by the Engineer, amounts shall be deducted from the unit prices in partial payment estimates to amply cover such cleanup and correction.
(xi) Failure to file required Equal Opportunity and Affirmative Action forms.

b) Whenever the DISTRICT shall, in accordance herewith, withhold any monies otherwise due the Contractor, written notice of the amount withheld and the reasons therefore will be given the Contractor. After the Contractor has corrected the enumerated deficiencies, the DISTRICT will promptly pay to the Contractor the amount so withheld. When monies are withheld to protect the DISTRICT against claims or liens of mechanics, material men, Subcontractors, etc., the DISTRICT

may at its discretion permit the Contractor to deliver a surety bond in terms and amount satisfactory to the DISTRICT, indemnifying the DISTRICT against any loss or expense, and upon acceptance thereof by the DISTRICT, the DISTRICT shall release to the Contractor monies so withheld.

B-73 Waiver of Interest

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

B-74 Satisfaction of Claims and Liens

Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the DISTRICT, a complete release of all liens and claims arising out of this Contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as it has knowledge or information the releases and receipts include all the labor and material for which a lien or claim could be filed; but the Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Engineer, to indemnify the DISTRICT against any lien or claim. If any lien or claim remains unsatisfied after all payments are made, the Contractor shall refund to the DISTRICT all monies that the latter may be compelled to pay in discharging such a lien, or claim, including all costs and reasonable attorney's fees.

PART 4
SPECIFICATIONS

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. General:

1. The Contract Documents describe the Work to be performed under this Contract which includes, but is not limited to, furnishing all plant, tools, equipment, materials, supplies, and manufactured articles for the Project. It shall also include the furnishing of all transportation and services, including fuel, power, water, or other operations required for the performance of the Contract in accordance with the Contract Documents.
2. The Contractor shall carefully review all sections of the Specifications in order to completely understand the Work and all constraints including schedule, environmental, permit and material requirements.
3. The Contractor is encouraged to proceed in an orderly and expeditious manner based on the constraints described in the Contract Documents and Specifications. All Work is to be constructed in strict accordance with the Contract Drawings and Specifications and subject to the terms and conditions of the Contract.

B. A draft encroachment permit for work performed in the Humboldt County Right-of-Way has been secured by the District and has been included as an Appendix to these Specifications. The Contractor shall be responsible for finalizing the encroachment permit with the County, including development of an approved traffic control plan and all other requirements for finalizing the permit. The Contractor shall abide by all provisions and requirements of said permit and said permit requirements shall become part of the contract documents.

C. The Contractor shall obtain all other necessary permits and comply with them and all other applicable Local, State, and Federal laws and regulations.

D. The Contractor shall familiarize itself with the Geotechnical report completed for this project:

1. “Final Geotechnical Report: MCSD Central Ave Water and Sewer Mains McKinleyville, CA.” March 2022. Prepared by Crawford & Associates, Inc. This report covers the geotechnical assessment for the replacement/rehabilitation of the water and sewer mains along Central Ave.

E. Location of the Work:

1. McKinleyville, California on Central Avenue from Sutter Road to Hiller Road. See the Cover Sheet on the Drawings for more information.

F. Contractor’s Duties:

1. Except as specifically noted otherwise, provide and pay for:
    a. Labor, materials and equipment.
    b. Tools, construction equipment and machinery.
    c. Water, heat, and utilities required for construction.

d. All other facilities and services necessary for proper execution and completion of Work.

2. Pay legally required sales, consumer and use taxes.

3. Conform to the requirements of the Humboldt County Encroachment Permit. Conform to the requirements in all permits and easement agreements.

4. Secure and pay for, as necessary for proper execution and completion of the Work, all other applicable permits and licenses, except when explicitly noted otherwise.

5. Contractor is responsible for notifying businesses and coordinating with them for turning off water and disconnecting sewer during construction.

6. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of the Work including all necessary notification and licensing for communications devices and protocols.

7. Promptly submit written notice to Engineer of observed variance of Contract Documents from legal requirements.

8. If any Subcontractor or person employed by the Contractor shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, that person shall be discharged immediately on the requisition of the Engineer or Owner, and such person shall not again be employed on the Work.

9. The Laydown and storage areas have been provided to the Contractor in the limits of work as shown on the Drawings. If required, the Contractor shall obtain all additional laydown and storage areas necessary for the execution of the Work. Contractor shall obtain all necessary permissions and approvals for use of laydown and storage areas and shall submit a signed statement from the property owner granting permission and holding the District harmless from any and all damages that may result from the Contractor's use of the site.

10. The Contractor shall obtain its own disposal site for replaced soils and other debris. Prior to the use of disposal sites the Contractor must submit a signed statement from the property owner granting permission to spoil materials and holding the District harmless from any and all damages that may result from the spoiling of materials. The Contractor shall contact Humboldt County Department of Environmental Health prior to disposal of any soils off-site.

11. The contractor is responsible for providing construction staking and surveying as required for the job. The District will provide control point information as needed for the purpose of locating the project components. The Contractor shall mark the location of all new water lines and appurtenances 48 hours in advance of construction for approval by the Engineer.

12. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with this project. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to all persons on the jobsite and damage to existing District equipment and structures.

13. The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons (including Contractor employees) and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours.

14. Safety provisions shall conform to U.S. Department of Labor (OSHA), the California Occupational Safety and Health Act, and all other applicable Federal,

State, County, and local laws, ordinances, codes, the requirements set forth below, and any regulations that may be detailed in other parts of these Specifications.

a. The Contractor shall have at the worksite copies of suitable extracts of the Construction Safety Orders of Cal-OSHA.

b. All work shall comply with the provisions of these and all other applicable laws, ordinances, and regulations.

G. All equipment shall be maintained in proper working order.

1.2 CONTRACT DESCRIPTION

A. Description:

1. The Contractor is advised to carefully review all sections of the Specifications in order to completely understand the Work and all constraints including the schedule, permit, and material requirements. The Work generally includes but is not limited to miscellaneous demolition; rehabilitation of the existing operating sewer main, laterals, and manholes; temporary bypass pumping; installation of a new water main including all associated piping, valves, appurtenances, and connections to existing waterlines; potholing, construction staking, trenching, shoring, sheeting, and bracing, excavation, grading, installation of subgrade material, tack coat, placement and compaction of asphalt, concrete, construction of concrete structures, traffic control, stockpiling, cleanup, and all other Work required to complete the modifications as shown in the Contract Drawings and described in the Specifications.

2. All Work is contained in the Contract Documents. The limits of Work are confined to District owned facilities. It will be the Contractor's responsibility to coordinate their activities to resolve conflicts with the District’s operations and other Contractors’ work on-site.

3. Perform Work of Contract in accordance with the General Conditions of Contract.

4. All risk of loss, damage or diminution to the Work shall rest with Contractor until final acceptance of the Work by the District and Engineer.

1.3 WORK SEQUENCE AND CONSTRAINTS

A. General:

1. Sewer:

a. Work under this Contract generally involves the rehabilitation of approximately 2,015 linear feet of the existing 8-inch ACP sewer main, 700 linear feet of the existing 6-inch ACP sewer main, the existing 4-inch sewer laterals to property line or cleanout, and the existing manholes. Rehabilitation of the existing sewer mains, laterals, and manholes will include temporary sewer bypass pumping, cleaning of the existing sewer, pre- and post- CCTV inspection, potential point repairs, installation of CIPP lining, potential open cut trenching of sections (if required), reinstatement of laterals, reconnection of sewer pipelines, and all other work as shown on the Plans and described in the Specifications.

2. Water:

a. Work under this Contract generally involves the construction of approximately 2,240 linear feet of 16-inch PVC water pipe to replace the existing 16-inch ACP, 333 linear feet of 10-inch PVC water main on

Nursery Way, 245 linear feet of 8-inch PVC water main on Heartwood Rd, and all service connections, appurtenances, fittings, paving, and all other work as shown on the Plans and described in the Specifications.

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

4. Changes to the existing utilities or any new connections thereto must be coordinated to provide the least possible interference with site and utility operation. Prior to any planned Work, all materials, fittings, supports, equipment, and tools shall be on the site and all necessary labor scheduled prior to starting any connection Work.

5. The Contractor will be required to coordinate their schedule with District personnel, Engineer, and business owners who will be affected to ensure minimal interruption to the operation of the sewer and water system. Should field conditions warrant the postponement of the installation of a portion of a particular line, as determined by the Engineer, the Contractor shall be prepared to resume installation of the pipeline at an alternative location along the alignment as field conditions permit.

6. The Contractor shall submit a schedule and work plan noting anticipated days of work and anticipated times for start and stop of work for each day. See Section B-19.j of General Conditions.

7. The work under this Contract shall be conducted in a manner that will minimize shutdowns, roadway closures, or traffic obstructions caused by construction. Shutdowns causing damage to adjacent public and private property shall not be permitted, and any damage resulting shall be the sole responsibility of the Contractor.

B. Specific Sequence and Constraints:

1. The first order of business is submission of submittals. Complete submittals for all items to be incorporated into the Work shall be made no later than twenty (20) work days following receipt of Notice to Proceed.

2. The Contractor shall include all Work described in this section in the Construction schedule. The sequence and constraints identified in this section shall be followed in the construction of the Work. However, alternatives to these sequences and constraints may be submitted by the Contractor for review by the District.

3. Specific Sequencing constraints include:

   a. The pre-construction conference described in this Section shall be coordinated to accommodate attendance by representatives of the District.

   b. Contractor shall anticipate weekly construction progress meetings with District staff to review work progress and issues (see Section 01 30 00).

   c. Contractor shall notify the Arcata Fire District/McKinleyville Station, Arcata Mad River Ambulance, Arcata and Mad River Transit system,

CHP, Sheriff, Northern Humboldt Union High School District, and McKinleyville Union School District, of any construction activity that may affect traffic and potentially impact emergency vehicle and fire apparatus access. Additionally, Contractor shall notify the Arcata Fire District/McKinleyville Station of any fire and life safety concerns.

d. Stockpiling of excavated soils that are potentially contaminated is not allowed. Contractor to remove contaminated material from the site and dispose of it at an approved disposal site.

e. All new utilities must be tested by the Contractor and accepted by the District before they can be put into service, before connections between new and existing facilities can be made, and before old facilities can be abandoned.

f. Contractor shall maintain vehicular and pedestrian access at all times throughout the project duration at all points in the project.

4. Water-Specific Sequencing Constraints include:

a. All new utilities must be disinfected and tested by the Contractor and accepted by the District before they can be put into service, connections between new and existing facilities can be made, and old facilities can be abandoned.

b. The existing District water distribution system shall remain in operation during the duration of the Work except when shutdowns are required for connections. The existing water main will be used to serve the connections between Sutter Road and Hiller Road on Central Ave until the new pipeline, services and fire hydrant connections are installed. It is the responsibility of the Contractor to repair any damage to the existing water main, water services, sewer laterals, and any underground facilities that may result from construction activities.

c. Contractor shall provide as much notice as possible but a minimum of fourteen (14) calendar days' written notice prior to making any connections between water mains or switching over the service connections from the existing water pipeline to the new pipeline. Written notice for modifying service connections shall be provided directly to business owners. Contractor shall not make connections between mains until written approval is obtained from the District. It is anticipated that some of these connections may be made during regular work hours (7 a.m. to 6 p.m.) and some of these connections may be required to be made during non-regular work hours to minimize customer service interruptions. As much pipeline as possible shall be installed and tested prior to any shutdowns occurring. All required parts and fittings shall be onsite and assembled to the extent possible prior to shutting down an existing water main or service. Once a main is shut down or a service is disconnected for a new connection, work shall proceed diligently until the connection is complete. Under no circumstances shall water service be unavailable for longer than eight consecutive hours due to a connection between water mains. Under no circumstances shall a given water service line be disconnected for longer than four consecutive hours.

d. No new valves shall be installed on the existing 16-inch water main until the new 16-inch water main is in service.

5. Sewer-Specific Sequencing Constraints include:

    a. The Contractor may disturb laterals from service for a maximum period of 8 hours. While laterals are disturbed, the Contractor may request that property owners minimize wastewater flows. The Contractor shall provide each property owner a minimum of 48 hours advance written notice and two (2) hours advance notification in person of the upcoming work. The Contractor shall also notify each property owner as soon as work is completed.

    b. Any section, from manhole to manhole, of sewer main being rehabilitated in a given day shall be completed within that workday. As soon as CIPP is cured in the main, Contractor shall proceed diligently to reinstate sewer laterals to the main to minimize inconvenience to property owners.

1.4 CONTRACT METHOD

A. The Work of this Contract is based on the Bid Schedule provided in Part 1 and Section 01 22 00 – Measurement and Payment.

B. The Contractor shall include the requirements of the General Conditions of the Contract as a part of all its subcontract agreements.

1.5 UNDERGROUND FACILITIES

A. The Contractor shall exercise care in all excavations to avoid damage to existing underground facilities. This shall include potholing and hand digging in those areas where underground facilities are known to exist until they have been sufficiently located to avoid damage to the facilities.

B. Prior to fabrication of any materials, the Contractor shall verify the locations and elevations of existing underground facilities which the Contractor is connecting to.

C. The Contractor shall exercise care in maintaining those pipes and valves to be abandoned and/or removed which are required for the continuing operation of the existing facilities until such time as they can be abandoned. The Contractor shall exercise extreme caution in working in any area adjacent to existing underground pipes. It is essential that the existing utilities be maintained in service until the new Work is ready for full-time operation and is placed in service.

D. No additional compensation shall be provided the Contractor for compliance with the provisions of this section for the damage and repair of such facilities due to the lack of care.

1.6 PROJECT MEETINGS

A. See Section 01 30 00 – Administrative Requirements

1.7 CONTRACTOR USE OF PREMISES

A. Construction is limited to the Public Right of Way and staging areas shown on drawings.

1. Contractor shall obtain all necessary laydown and storage areas necessary for the execution of the Work. The District has limited space available for minor laydown and storage near the Project site. Contractor shall obtain all necessary permissions and approvals for use of laydown and storage areas and shall submit a signed statement from the property owner granting permission and holding the District harmless from any and all damages that may result from the Contract's use of the site.

2. Prior to commencement of any development, a final plan detailing the locations and sizes of all construction staging areas, storage areas, stockpiling areas, concrete washout areas, Contractor employee parking areas, and other construction areas appurtenant to the authorized development shall be submitted to the Engineer. The plan shall demonstrate and include the following, at a minimum:

    a. No construction staging, storage, stockpiling, concrete washout, parking, or other areas associated with construction of the authorized development shall be located within wetlands or other environmentally sensitive habitat areas (ESHA).

    b. Designated areas for construction vehicle or equipment cleaning, fueling, and/or maintenance shall be located at least 100 feet from coastal wetlands and waters, drainage courses, and storm drain inlets and shall be designed to fully contain any spills of fuel, oil, or other contaminants.

    c. Concrete washout areas shall be located at least 100 feet from coastal wetlands and waters, drainage courses, and storm drain inlets and shall be implemented in a manner that controls runoff and prevents leaching to underlying soils.

    d. The limits of such areas shall be depicted on plans and maps provided to the Engineer at least two weeks prior to commencement of construction.

    e. If necessary, areas shall be flagged or otherwise delineated to ensure that construction activities are contained within designated areas.

B. Confine operations at the site to areas permitted by the Contract Documents.

C. Do not encumber site with materials or equipment beyond those required to complete the Work.

D. Do not load structure or roadway with weight that will endanger or render unusable any structures or roadways.

E. Assume full responsibility for protection and safekeeping of products stored on premises.

F. Obtain and pay for use of additional storage of work area for operations.

G. Return all surface areas, including vegetated areas, to their original condition upon completion of the Work.

H. Repair all damaged utilities, roadways, sidewalks, islands, fences, property, and appurtenances damaged during the course of construction to pre-existing condition or better.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 20 00

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 GENERAL

A. Unless otherwise specified in other individual sections of these Specifications, quantities of Work shall be determined from measurements or dimensions in horizontal planes.

B. Units of measurement shall be in accordance with U.S. Standard Measures.

C. See Section VI of the General Conditions for special provisions related to progress payments and payment schedule to the contractor.

D. The Work has been organized into bid items for convenience to assist the Contractor in quantifying the major components of the Work and shall in no way be interpreted to be comprehensive. The bid shall be comprehensive and shall include all work associated with the project as shown on the Drawings and described in the Specifications, including all necessary labor, materials, equipment, supervision, sales tax, and all other applicable taxes and fees.

1.2 MEASUREMENT AND PAYMENT

A. The measurement and payment items are listed below:

1. The payments to the Contractor are based on the following items. It is the intent that the scope of the description of the following items encompasses the entire scope of the Work as shown on the Contract Drawings and described in the Specifications. The bid amounts shall be for complete in place installations.

BASE BID SCHEDULE

Item 1 – Mobilization/Demobilization
Payment for this item shall be on a lump sum basis per the amount listed for this item in the Bid Schedule. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for mobilizing equipment, materials, and labor to the project site as well as demobilization of the same for the construction of the project. Items covered by this include, but are not limited to, bonds, insurance, contracting and administrative costs, permitting and permit compliance costs, costs associated with temporary facilities and utilities, punch list items, repairs of damaged property, repairs to damaged utilities, site cleanup, and project maintenance and warranty.

When 10 percent of the total original Contract amount is earned from bid items, excluding amounts paid for materials on hand, 90 percent of the amount of the bid price for mobilization, or 10 percent of the total Contract amount, whichever is least, will be paid for mobilization. Upon completion of all Work on the project, payment of the balance of the bid amount for mobilization/demobilization will be paid.

Item 2 – Traffic Control
Payment for this item shall be on a lump sum basis per the amount listed for that item in the Bid Schedule. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for providing traffic control as described in the Drawings, in these Specifications, and as required by the Humboldt County Encroachment Permit (draft

Humboldt County Encroachment Permit included as an Appendix to these Specifications, final to be obtained by Contractor). Items covered by this item include, but are not limited to, labor, materials, equipment, and other expenses for complete traffic control throughout the length of the project including times when the Contractor is not working on site. Items covered by this include but are not limited to finalizing the Humboldt County Encroachment permit, development and implementation of an approved traffic control plan, notifications, road detours, signage, lighting, flaggers, temporary pavement delineation, barricades, plating, K-Rail, and all other materials and equipment needed to temporarily control traffic throughout the project.

Item 3 – Sediment and Erosion Control Including Revegetating Disturbed Areas
Payment for this item shall be on a lump sum basis per the amount listed for that item in the Bid Schedule. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to construct and maintain erosion and sediment control in compliance with all applicable regulations, and per Best Management Practices. This work covers all Contractor costs and effort associated with providing erosion and sediment control measures including, but not limited to silt fences, fiber rolls, diversion dikes, and other Best Management Practices, complying with NPDES, and general construction permits. This bid item also includes, but is not limited to, all necessary revegetation and straw mulching around disturbed vegetated and landscaped areas.

Item 4 – Removal and Disposal of Asbestos Cement Pipe
Payment for this item shall be on a lump sum basis per the amount listed for that item in the Bid Schedule. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to remove and dispose of existing asbestos cement pipe (ACP) water and sewer mains as required including, but not limited to, cutting, removing, and properly disposing of ACP in accordance with OSHA requirements and all other applicable regulations and safety protocols, and cleanup.

Item 5– Dewatering System / Water Control
Payment for this item shall be on a lump sum basis per the amount listed for that item in the Bid Schedule. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to construct and maintain an effective dewatering system including control and disposal of water from draining the active 18-inch, 16-inch, 8-inch, and 6-inch water lines during connections, draining water used for disinfection and pressure testing of new mains, and any other dewatering activities required during the course of construction. Items covered by this include, but are not limited to, dewatering pumps, hoses and tanks, dewatering bags, dewatering basins, de-chlorination, and dewatering disposal.

Item 6 – 2” Waterline Modifications
Payment for this item shall be on a lump sum basis per the amount listed for that item in the Bid Schedule. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for all materials, labor, equipment and supervision necessary for 2-inch waterline modifications located on the west side of Central Avenue, and all associated appurtenances complete and in place including, but not limited to utility potholing, asphalt/concrete sawcutting, trenching and excavation, shoring, spoil and waste disposal, backfilling, bedding and cover material, removal of existing water valves boxes and riser if specified on Plans, plugging abandoned existing pipe, control of grade, flushing, temporary paving, cleanup, repair of all disturbed surfaces (including but not limited to asphalt paving, curb and gutter, sidewalk, traffic stripes and pavement markings).

Item 7 – 6” PVC Water Pipe and Fittings (near Station 14+55)
Payment for this item shall be on a lump sum basis per the amount listed for that item in the Bid Schedule. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for all materials, labor, equipment and supervision

necessary to furnish and install the 6" PVC pipe and fittings near Station 14+55, and all associated work complete and in place including, but not limited to utility potholing, layout, construction staking, asphalt/concrete sawcutting, trenching and excavation, including necessary shoring, spoil and waste disposal, backfilling, bedding and cover material, tracer wire, warning tape, installation of pipe, pipe fittings, connection to main, connection to the existing water meter and appurtenances, thrust blocks, restrained joints, removing existing valve and capping at existing main, plugging abandoned existing pipe, control of grade, flushing, temporary paving, pressure testing, disinfection, compaction testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings and all other work necessary to install a complete system that is not called out under other specific bid items).

The Contractor shall expect utility conflicts and will be required to route new utilities around existing crossing utilities including, but not necessarily limited to, gas lines, electrical lines, communication lines, and storm drains, and will be required to support existing utilities and backfill excavations per the requirements in the Drawings and Specifications. Contractor shall repair all damage to existing utilities at Contractor's expense.

Item 8 – 8" PVC Water Pipe and Fittings for Water Line 2.0 (Heartwood Drive)
Measurement for this item shall be on a per linear foot of pipe installed basis, including fittings, as measured horizontally by the Engineer in the field. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to furnish and install the 8" PVC pipe and fittings for Water Line 2.0 on Heartwood Drive, and all associated appurtenances complete and in place including, but not limited to utility potholing, construction staking, layout, asphalt/concrete sawcutting, trenching and excavation, including necessary shoring, spoil and waste disposal, backfilling, bedding and cover material, tracer wire, warning tape, installation of pipe, pipe fittings, and appurtenances, connection to existing main, thrust blocks, restrained joints, control of grade, flushing, temporary paving, pressure testing, disinfection, compaction testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings).

The Contractor shall expect utility conflicts and will be required to route new utilities around existing crossing utilities including, but not necessarily limited to, gas lines, electrical lines, communication lines, and storm drains, and will be required to support existing utilities and backfill excavations per the requirements in the Drawings and Specifications. Contractor shall repair all damage to existing utilities at Contractor's expense.

Item 9– 10" PVC Water Pipe and Fittings for Water Line 3.0 (Nursery Way)
Measurement for this item shall be on a per linear foot of pipe installed basis, including fittings, as measured horizontally by the Engineer in the field. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to furnish and install the 10" PVC pipe and fittings for Water Line 3.0 on Nursery Way, and all associated appurtenances complete and in place including, but not limited to utility potholing, construction staking, layout, asphalt/concrete sawcutting, trenching and excavation, including necessary shoring, spoil and waste disposal, backfilling, bedding and cover material, tracer wire, warning tape, installation of pipe, pipe fittings, and appurtenances, connection to existing main, thrust blocks, restrained joints, control of grade, flushing, temporary paving, pressure testing, disinfection, compaction testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings).

The Contractor shall expect utility conflicts and will be required to route new utilities around existing crossing utilities including, but not necessarily limited to, gas lines, electrical lines, communication lines, and storm drains, and will be required to support existing utilities and backfill excavations per the requirements in the Drawings and Specifications. Contractor shall repair all damage to existing utilities at Contractor's expense.

Item 10 – 16" PVC Water Pipe and Fittings
Measurement for this item shall be on a per linear foot of pipe installed basis, including fittings, as measured horizontally by the Engineer in the field. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to furnish and install the 16" PVC pipe, and all associated appurtenances complete and in place including, but not limited to utility potholing, construction staking, layout, asphalt/concrete sawcutting, trenching and excavation, including necessary shoring, spoil and waste disposal, backfilling, bedding and cover material, tracer wire, warning tape, installation of pipe, pipe fittings, and appurtenances, thrust blocks, restrained joints, control of grade, flushing, temporary paving, pressure testing, disinfection, compaction testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings). Any other item of Work required for successful completion of the water portion of the project not explicitly stated in another bid item shall be included with this bid item.

The Contractor shall expect utility conflicts and will be required to route new utilities around existing crossing utilities including, but not necessarily limited to, gas lines, electrical lines, communication lines, and storm drains, and will be required to support existing utilities and backfill excavations per the requirements in the Drawings and Specifications. Contractor shall repair all damage to existing utilities at Contractor's expense.

Item 11 – 6" Water Gate Valves
Measurement for this item shall be on a per each basis installed, except for 6" valves on fire hydrant services which shall be paid for under Bid Item 25. Payment shall include full compensation for all labor, equipment, materials and supervision to install 6" gate valves as shown on the Plans complete and in place including but not limited to the valve, pipe riser, valve box and cover, concrete collar, restrained joints, thrust block(s), excavation, temporary paving, final resurfacing, and clean up.

Item 12 – 8" Water Gate Valves
Measurement for this item shall be on a per each basis installed. Payment shall include full compensation for all labor, equipment, materials and supervision to install 8" gate valves as shown on the Plans complete and in place including but not limited to the valve, pipe riser, valve box and cover, concrete collar, restrained joints, thrust block(s), resurfacing and clean up.

Item 13– 10" Water Gate Valves
Measurement for this item shall be on a per each basis installed. Payment shall include full compensation for all labor, equipment, materials and supervision to install 10" gate valves as shown on the Plans complete and in place including but not limited to the valve, pipe riser, valve box and cover, concrete collar, restrained joints, thrust block(s), resurfacing and clean up.

Item 14– 12" Water Gate Valves
Measurement for this item shall be on a per each basis installed. Payment shall include full compensation for all labor, equipment, materials and supervision to install 12" gate valves as shown on the Plans complete and in place including but not limited to the valve, pipe riser, valve box and cover, concrete collar, restrained joints, thrust block(s), resurfacing and clean up.

Item 15 – 16" Water Butterfly Valves
Measurement for this item shall be on a per each basis installed. Payment shall include full compensation for all labor, equipment, materials and supervision to install 16" butterfly valves as shown on the Plans complete and in place including but not limited to the valve, pipe riser, valve box and cover, concrete collar, restrained joints, thrust block(s), excavation, including necessary shoring, demolition and removal of existing thrust blocks as required, pipe sections and couplers as indicated on the Plans, resurfacing and clean up.

Item 16 – 18" Water Butterfly Valves
Measurement for this item shall be on a per each basis installed. Payment shall include full

compensation for all labor, equipment, materials and supervision to install 18" butterfly valves as shown on the Plans complete and in place including but not limited to the valve, pipe riser, valve box and cover, concrete collar, restrained joints, thrust block(s), excavation, including necessary shoring, demolition and removal of existing thrust blocks as required, pipe sections and couplers as indicated on the Plans, resurfacing and clean up.

Item 17 – Item 23 – Water Connection Assemblies

Payment for these items shall be on a lump sum basis per the amount listed for that item in the Bid Schedule. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to furnish and install connection at new main, connection at existing main, and all piping and appurtenances in between connections complete and in place including, but not limited to layout, installation of piping, including all tees, bends, fittings, connections to the existing water system, all appurtenances, thrust blocks, restrained joints, removing existing valves as shown on the Drawings and capping locations where valves were removed, plugging abandoned existing pipe, utility potholing, construction staking, asphalt/concrete sawcutting, trenching and excavation, including necessary shoring, spoil and waste disposal, backfilling, bedding and cover material, tracer wire, warning tape, control of grade, flushing, pressure testing, disinfection, compaction testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings).

The Contractor shall expect utility conflicts and will be required to route new utilities around existing crossing utilities including, but not necessarily limited to, gas lines, electrical lines, communication lines, and storm drains, and will be required to support existing utilities and backfill excavations per the requirements in the Drawings and Specifications. Contractor shall repair all damage to existing utilities at Contractor's expense.

The connection assemblies include the following:

Item 17	Connection Assembly at Station 27+52 (near BMW)
Item 18	Connection Assembly near Station 29+53
Item 19	Connection Assembly at Sutter Road
Item 20	Connection Assembly at Central Ave and Heartwood Drive to East
Item 21	Connection Assembly at Heartwood Drive at West End of Water Line 2.0
Item 22	Connection Assembly at Holly Drive
Item 23	Connection Assemblies at Hiller Road

Item 24 – 1" Water Service Lines

Measurement for this item shall be on a unit basis for each 1" Water Service Line installed as shown on plans. Payment shall include full compensation for all labor, equipment, materials, and supervision to install water service lines as shown on Plans, and all associated appurtenances complete and in place including, but not limited to utility locating, sawcutting asphalt, trenching and excavation, including necessary shoring, spoil and waste disposal, bedding installation of piping and fittings installation of service saddle and corporation stop at the main, connection to existing water meter, fittings, all appurtenances, disconnecting existing service line from main, closing existing corp stop, disconnecting existing service from meter, removing existing service from meter box, plugging abandoned existing service line, control of grade, flushing, temporary paving, pressure testing, disinfection, backfill and compaction, compaction testing, cleanup, repair of all

disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings).

Item 25 – Multi-Meter Water Service Lines
Measurement for this item shall be on a unit basis for each 2" or 3" water service line installed as shown on the plans. Payment shall include full compensation for all labor, equipment, materials and supervision to install service as shown on the Plans, and all associated appurtenances complete and in place including, but not limited to utility locating, sawcutting asphalt, trenching and excavation, including necessary shoring, spoil and waste disposal, bedding installation of piping, connection at main, service saddle, gate valve, new water meter manifold, fittings, disconnecting existing service from main, removing existing valve at main, disconnecting existing service, capping/plugging/blind flanging abandoned existing service line and all other material required for a complete seal, control of grade, flushing, paving, pressure testing, disinfection, compacting testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings).

Item 26 – Fire Hydrant Services
Measurement for this item shall be on a unit basis for each fire hydrant assembly installed. Payment shall include full compensation for all labor, equipment, materials and supervision to salvage the existing fire hydrant (FH) and install a new FH assembly as shown on the Plans, and all associated appurtenances complete and in place including, but not limited to construction staking, layout, trenching and excavation, including necessary shoring, installation of piping, fittings as required, installing a new 6" gate valve with box, removing and salvaging the existing FH, installing salvaged existing FH on new FH service, disconnecting existing FH service from main, removing existing valve at main, capping/plugging/blind flanging abandoned existing FH service and all other material required for a complete seal, thrust block(s), flushing, disinfection, pressure testing, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk) to original condition, and clean up.

The Contractor shall expect utility conflicts and will be required to route new utilities around existing crossing utilities including, but not necessarily limited to, gas lines, electrical lines, communication lines, and storm drains, and will be required to support existing utilities and backfill excavations per the requirements in the Drawings and Specifications. Contractor shall repair all damage to existing utilities at Contractor's expense.

Item 27 – Combination Air Valve Assembly (Including Precast Vault)
Measurement for this item shall be on a unit basis for each Combination Air Valve installed. Payment shall include full compensation for all labor, equipment, materials and supervision to install a combination air valve on the new water main inside a precast vault, as shown on the Plans complete and in place including but not limited to utility locating, sawcutting asphalt, trenching and excavation, including necessary shoring, connection to main line, air valve, plug valve, piping, pipe riser, precast cover, concrete collar, thrust block(s), and resurfacing.

Item 28 – Temporary Sewer Bypass Pumping
Measurement for this item shall be on a lump sum basis. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to install and maintain temporary bypass pumping facilities for the sanitary sewer collection system throughout the length of the project including times when the Contractor is not working on site. This item also includes the removal of temporary pumping and restoration of pavement, sidewalks, and other areas. The Contractor shall coordinate with the businesses to avoid disruption of sewer flow. The Contractor shall develop and submit a bypass pumping plan for Engineer approval based on Contractor proposed construction schedule and sequencing.

Item 29 – Pre-Rehabilitation Closed-Circuit Television (CCTV) Inspection and Pipe Cleaning – Sewer Mains
Measurement for this item shall be on a lump sum basis. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to perform CCTV inspection on the existing 6-inch and 8-inch sewer mains and cleaning activities performed by the Contractor.

Item 30 – Pre-Rehabilitation Closed-Circuit Television (CCTV) Inspection and Pipe Cleaning – Sewer Service Laterals
Measurement for this item shall be on a unit basis for each sewer service lateral that is CCTV inspected and cleaned. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to perform CCTV inspection on the existing 4-inch sewer service laterals and cleaning activities performed by the Contractor.

Item 31 – Set up for Sewer Main Open Cut Section Repairs
Measurement for this item shall be on a unit basis for each set up for sewer main open cut section repairs defined on Plans or as directed by Engineer after initial CCTV inspection prior to CIPP lining. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to set up equipment for an open cut section repair, perform initial excavation at each end, and furnish and install connections on each end of section repair. Additionally, the unit price shall include, but not be limited to utility potholing, asphalt/concrete sawcutting, spoil and waste disposal, backfilling, removal of existing pipe, all associated appurtenances to make connections on each end of section repair, fittings, couplers, bedding and cover material, control of grade, flushing, temporary paving, compaction testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings).

Item 32 – Sewer Main Open Cut Section Repairs
Measurement for this item shall be on a per linear foot of pipe installed basis as defined on Plans or as directed by Engineer and measured horizontally by the Engineer in the field. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to furnish and install a new section of 6-inch or 8-inch sewer pipe by open cut. Additionally, the unit price shall include, but not limited to installation of pipe, utility potholing, asphalt/concrete sawcutting, trenching and excavation, including necessary shoring, connection to existing piping, spoil and waste disposal, backfilling, bedding and cover material, control of grade, flushing, temporary paving, compaction testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings).

Item 33 – Set up for Sewer Service Lateral Open Cut Replacement
Measurement for this item shall be on a unit basis for each set up for sewer main open cut replacement defined on Plans or as directed by Engineer after initial CCTV inspection prior to CIPP lining. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to set up equipment for an open cut section repair, perform initial excavation at each end, and furnish and install connections on each end of section repair. Additionally, the unit price shall include, but not be limited to utility potholing, asphalt/concrete sawcutting, spoil and waste disposal, backfilling, removal of existing pipe, installation of a new cleanout, connecting the new lateral to the new cleanout and existing main, fittings, couplers, bedding and cover material, control of grade, flushing, temporary paving, compaction testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk), traffic stripes and pavement markings, asphalt paving.

Item 34 – Sewer Service Lateral Open Cut Replacement
Measurement for this item shall be on a per linear foot of pipe installed basis and measured horizontally by the Engineer in the field. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to furnish and install new section of 4-inch sewer lateral pipe by open cut. Additionally, the unit price shall include, but not limited to installation of pipe, utility potholing, asphalt/concrete sawcutting, trenching and excavation, excavation including

necessary shoring, connection to existing piping, spoil and waste disposal, backfilling, bedding and cover material, control of grade, flushing, control of sewage, temporary paving, compaction testing, cleanup, repair of all disturbed surfaces (including but not limited to pavement, curb and gutter, sidewalk, traffic stripes and pavement markings).

Item 35 – Set Up for Chemical Grout Injection into Pipe Cracks
Measurement for this item shall be on a unit basis for each set up for chemical grout injection into pipe cracks and will be based upon completion of each point repair equipment set up at locations as directed by the Engineer upon review of the initial CCTV inspection. Payment shall include full compensation for all materials, labor, equipment and supervision required to set up equipment to inject chemical grout into pipe cracks to stop infiltration.

Item 36 – Chemical Grout Injection into Pipe Cracks
Measurement for this item shall be on a unit bid price for each gallon of chemical grout injected into pipe cracks. Payment shall include full compensation for all materials, labor, equipment, and supervision required to probe, drill, and inject chemical grout into pipe cracks to stop infiltration. Additionally, the unit price shall include, but not to be limited to disposal of materials, equipment, and personnel, cleanup, and all other work necessary, complete and in place.

Item 37 – Set up for Rehabilitation of 4” Sewer Laterals Using Cured-in-Place Pipe Lining Method
Measurement for this item shall be on a unit basis for each 4-inch sewer lateral rehabilitated using the cured-in-place pipe lining method. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to set up equipment for CIPP lining.

Item 38 – Rehabilitation of 4” Sewer Laterals Using Cured-in-Place Pipe Lining Method
Measurement for this item shall be on a per linear foot of 4-inch sewer lateral rehabilitated basis using the cured-in-place pipe lining method. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to install full CIPP lining (except initial setup as provided for in Bid Item 36), and all associated appurtenances including, but not limited to, restoring existing facilities damaged by the construction; closing or removing of abandoned pipelines and structures, if required; control of ground and surface waters; surface restoration; cleanup, and all other work necessary, complete and in place.

Item 39 – Rehabilitation of 6” Sewer Main Using Cured-in-Place Pipe Lining Method
Measurement for this item shall be on the basis of the bid price per linear foot of rehabilitation of 6-inch sewer main using cured-in-place pipe lining. Payment shall include full compensation for all materials, labor, tools and equipment required to install CIPP lining as identified on the Plans and in the Specifications. Additionally, the unit price shall include, but not be limited to, all associated appurtenances, restoring existing facilities damaged by the construction; closing or removing of abandoned pipelines and structures, if required; reinstatement of (re-opening) all lateral connections and manholes; control of ground and surface waters; surface restoration; cleanup, warranty inspection, and all other work necessary, complete and in place.

Item 40 – Rehabilitation of 8” Sewer Main Using Cured-in-Place Pipe Lining Method
Measurement for this item shall be on the basis of the bid price per linear foot of rehabilitation of 8-inch sewer main using cured-in-place pipe lining. Payment shall include full compensation for all materials, labor, tools and equipment required to install CIPP lining as identified on the Plans and in the Specifications. Additionally, the unit price shall include, but not be limited to, all associated appurtenances, restoring existing facilities damaged by the construction; closing or removing of abandoned pipelines and structures, if required; reinstatement of (re-opening) all lateral connections and manholes; control of ground and surface waters; surface restoration; cleanup, warranty inspection, and all other work necessary, complete and in place. Any other item of Work required for successful completion of the sewer portion of the project not explicitly stated in another bid item shall be included with this bid item.

Item 41 – Rehabilitation of Sewer Manholes
Measurement for this item shall be on a unit basis for each sewer manhole rehabilitated. Payment shall include full compensation for furnishing all materials, labor, equipment and supervision necessary to install the rehabilitation coating system, complete and in place for all manholes identified on the Plans and Specifications. Additionally, the unit price shall include, but not be limited to, pre-rehabilitation cleaning and disposal of materials; restoring existing facilities damaged by the construction; reinstatement of all laterals and other connections (if required); surface restoration; cleanup, and all other work necessary, complete and in place.

Item 42 – Post-Rehabilitation Closed-Circuit Television (CCTV) Inspection and Pipe Cleaning – Sewer Mains
Measurement for this item shall be on a lump sum basis. Measurement shall correspond to percent complete as confirmed by the Engineer. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to perform CCTV inspection on the existing 6-inch and 8-inch sewer mains and cleaning activities performed by the Contractor.

Item 43 – Post-Rehabilitation Closed-Circuit Television (CCTV) Inspection and Pipe Cleaning – Sewer Service Laterals
Measurement for this item shall be on a unit basis for each sewer service lateral that is CCTV inspected and cleaned. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to perform CCTV inspection on the existing 4-inch sewer service laterals and cleaning activities performed by the Contractor.

END OF SECTION

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SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Coordination and project conditions
2. Field engineering
3. Pre-bid meeting
4. Preconstruction meeting
5. Progress meetings
6. As-built information

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for this item shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of various sections of Project to ensure efficient and orderly sequence of installation of construction elements.

1.4 FIELD ENGINEERING

A. Protect survey control points prior to starting site Work; preserve permanent reference points during construction.

B. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.

C. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer. The surveyor shall comply with the California Professional Land Surveyors' Act in replacement of all permanent survey monuments.

1.5 PRE-BID MEETING

A. Prior to awarding the Contract, a non-mandatory pre-bid meeting will occur as established in the Advertisement for Bids. The pre-bid meeting shall be attended by District representatives

and the Engineer. While non-mandatory, it is highly recommended that the Contractor's construction superintendent and/or project manager attend the meeting.

1.6 PRECONSTRUCTION MEETING

A. Contractor will schedule meeting after Notice of Award.

B. Prior to the commencement of Work at the site, a preconstruction meeting will be held at a mutually agreed upon time and place. The preconstruction meeting shall be attended by District representatives, Engineer, construction foreman, contractor's construction superintendent, key subcontractors, and any other parties required by the Contractor or the Engineer.

C. Unless previously submitted to the Engineer, the Contractor shall bring to the conference three (3) copies of each of the following:

1. Draft Construction Schedule.

2. Procurement schedule of major equipment and materials and items requiring long lead time.

3. Shop Drawing/Sample/submittal schedule.

4. Substitution requests.

5. Contact sheet designating contact information for the construction foreman, construction Superintendent, and Project Manager for the Contractor including cell phone numbers or contact information to allow for emergency contact after business hours.

D. At the preconstruction meeting the District will provide the Contractor with three (3) sets of the Contract Documents. It shall be the Contractor's responsibility to arrange to pay all costs of additional reproduction required by the Contractor.

E. The purpose of the meeting is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established.

F. The Engineer will preside at the preconstruction conference and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.

G. Agenda

1. Notice to Proceed date.

2. Distribution of Contract Documents.

3. Contractor's tentative schedule.

4. Submission of list of Subcontractors, list of products, schedule of values, and progress schedule.

5. Critical work sequencing.

6. Designation of personnel representing parties in Contract, and Engineer.

7. Procedures and processing of field decisions, submittals, substitutions, requests for information, applications for payments, proposal request, change orders, and contract closeout procedures.

8. Scheduling.

9. Major equipment deliveries and priorities.

10. Use of premises by Owner and Contractor.

11. Owner's requirements and occupancy.

12. Site Safety: Contractor’s assignments for safety and first aid.

13. Construction facilities and controls provided by Owner.

14. Temporary utilities provided by Owner.

15. Application for payment procedures.

16. Procedures for testing.

17. Procedures for maintaining record documents.

1.7 PROGRESS MEETINGS

A. The Engineer will schedule and administer progress meetings at the Site throughout the progress of the Works at minimum weekly intervals or as mutually agreed by Contractor and Owner.

B. The Engineer will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings. Provide data required to Engineer and be prepared to discuss all items on the agenda.

C. Attendance Required: Contractor’s superintendent, major Subcontractors and Suppliers, Owner and Engineer, as appropriate to agenda topics for each meeting.

D. Agenda will include, but not necessarily be limited to, the following:

1. Review of minutes of previous meetings.

2. Review of work progress since last meeting.

3. Field observations, problems, and decisions.

4. Identification of problems which impede planned progress.

5. Review of submittals schedule and status of submittals.

6. Review of off-Site material fabrication/processing and delivery schedules.

7. Review of health and safety concerns and issues.
8. Maintenance of progress schedule.
9. Corrective measures to regain projected schedules.
10. Planned progress during succeeding work period.
11. Coordination of projected progress.
12. Maintenance of quality and work standards.
13. Effect of proposed changes on progress schedule and coordination.
    a. Progress Payment.
    b. Change Orders.
    c. Claims.
    d. Field Work Directives.
    e. Requests for Information.
14. Applications for Payment.
15. Other business relating to the Works.

E. The Engineer will record minutes and distribute copies within two working days after meeting to participants and those affected by decisions made.

1.8 AS-BUILT INFORMATION

A. The Contractor shall contemporaneously maintain a sect of Contract Drawings at the work site which details which details the as-constructed construction conditions. The set shall be updated weekly by the Contractor and shall be available for review by the Engineer at the progress meetings.

B. If, in the opinion of the Engineer, as-built information is not contemporaneously maintained as work proceeds, partial payments within the construction period shall not be processed until information is satisfactorily completed.

C. As-built information shall be submitted to the Owner or Engineer at the completion of work for Engineer's use in preparation of final Record Drawings for the Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION

A. This Section covers shop drawings and other submittals that are required to be submitted to the Engineer during the course of this project.

1.2 SECTION INCLUDES

A. Submittal Procedures.

B. Proposed products list.

C. Product data.

D. Shop drawings.

E. Samples.

F. Design data.

G. Test reports.

H. Certificates.

I. Manufacturer's instructions.

J. Manufacturer's field reports.

K. Erection drawings.

1.3 Submittal Procedures

A. Transmit each submittal with Engineer accepted form. The Contractor shall submit electronic copies of all shop drawings, manufacturer’s cut sheets, material and product information proposed for use on the project, and all submittals required by these specifications and required by the Engineer.

B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.

C. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.

D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

E. Schedule submittals to expedite Project, and deliver to Engineer. Coordinate submission of related items.

F. For each submittal for review, allow 15 working days.

G. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.

H. Allow space on submittals for Contractor and Engineer review stamps.

I. When revised for resubmission, identify changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

K. Submittals not requested will not be recognized or processed.

1.4 RESUBMITTALS

A. The Engineer shall complete up to two detailed reviews of each submittal at no cost to the Contractor. The cost of additional reviews resulting from improper submission or completion of shop drawings shall be deducted by the District from Progress Payments.

1.5 SUBSTITUTIONS

A. The Engineer will consider proposals for substitution of materials, equipment, and methods only when said proposals are accompanied by full and complete technical data required to evaluate the proposed substitution.

B. The Contractor is responsible for determining in advance of the Bid Submission that all required materials and equipment will be available for installation within the Contract Time. In the event specified item or items will not be available, the Contractor shall notify the Engineer prior to submission of bids

1.6 PROPOSED PRODUCTS LIST

A. Within 15 working days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.7 PRODUCT DATA

A. Product Data: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. After review, produce copies and distribute in accordance with Submittal Procedures article and for record documents described in Section 01 70 00 - Execution Requirements.

1.8 SHOP DRAWINGS

A. Shop Drawings: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Submit number of opaque reproductions Contractor requires, plus three copies Engineer will retain. Alternatively, the engineer may require that all submittals are completed electronically.

D. When required by individual specification sections, provide shop drawings signed and sealed by professional engineer responsible for designing components shown on shop drawings.
   1. Include signed and sealed calculations to support design.
   2. Submit drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
   3. Make revisions and provide additional information when required by authorities having jurisdiction.

E. After review, produce copies and distribute in accordance with Submittal Procedures article and for record documents described in Section 01 70 00 - Execution Requirements.

1.9 SAMPLES

A. Samples: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Samples For Selection as Specified in Product Sections:
   1. Submit to Engineer for aesthetic, color, or finish selection.
   2. Submit samples of finishes from full range of manufacturers' standard colors, in custom colors selected, textures, and patterns for Engineer selection.

C. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

D. Include identification on each sample, with full Project information.

E. Submit number of samples specified in individual specification sections; Engineer will retain two samples.

F. Reviewed samples which may be used in the Work are indicated in individual specification sections.

G. Samples will not be used for testing purposes unless specifically stated in specification section.

H. After review, produce duplicates and distribute in accordance with Submittal Procedures article and for record documents purposes described in Section 01 70 00 - Execution Requirements.

1.10 DESIGN DATA

A. Submit for Engineer's knowledge as contract administrator or for Owner.

B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.11 TEST REPORTS

A. Submit for Engineer's knowledge as contract administrator or for Owner.

B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.12 CERTIFICATES

A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

1.13 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.14 MANUFACTURER'S FIELD REPORTS

A. Submit reports for Engineer’s benefit as contract administrator or for Owner.

B. Submit report in duplicate within 15 working days of observation to Engineer for information.

C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.15 ERECTION DRAWINGS

A. Submit drawings for Engineer's benefit as contract administrator or for Owner.

B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

C. Data indicating inappropriate or unacceptable Work may be subject to action by Engineer or Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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McKinleyville Community Services District
SHOP DRAWING & SUBMITTAL REVIEW FORM

Date:	**Contract Title:** Central Ave Water & Sewer Rehabilitation Project GHD Job #: 12560439
To: GHD, Inc. 718 Third Street Eureka, CA 95501 **Attention:** Nathan Stevens, PE Email: nathan.stevens@ghd.com Phone: (707) 443-8326 Fax: (707) 444-8330	**From:** Contractor Name Contractor Address Line 1 Contractor Address Line 2 **Submitted By:** **Signature:** Phone:

Spec Section or Dwg	Submittal No.	Rev. No.	Qty.	Subject of Shop Drawing or Submittal	Review Action

Engineer's Review Comments:

Signature: **Date:**

Review Action Explanation:

1. No Exceptions Taken
2. Make Corrections Noted – No Resubmittal Required
3. Amend and Resubmit
4. Rejected – Resubmit
5. Answer provided
6. Not Reviewed – Filed Only

Shaded areas for Engineer use only.

This review is only for general conformance with the design concept and the information given in the Construction Documents. Notations made on the submittals during this review do not relieve the Contractor from compliance with the requirements of the construction documents, including without limitation, the plans and specifications, and all applicable laws and codes. Review of that specific item shall not include review of an assembly of which the item is a component. The Contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods techniques, sequences and procedures of construction; and coordination of the Work with all other trades and performing all Work in a safe and satisfactory manner. This review is not for constructability or Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto. This review is subject to all provisions of the Contract Documents.

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SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality control and control of installation.

B. Tolerances.

C. References.

D. Mock-up requirements.

E. Testing and inspection services.

F. Manufacturers' field services.

G. Examination.

H. Preparation.

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. When manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date for receiving bids, except where specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. When specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

E. Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Engineer shall be altered from Contract Documents by mention or inference otherwise in reference documents.

1.5 MOCK-UP REQUIREMENTS

A. Tests will be performed under provisions identified in this section and identified in respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be the comparison standard for remaining Work.

D. Where mock-up has been accepted by Engineer and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so by Engineer.

1.6 TESTING AND INSPECTION SERVICES

A. If testing and inspection by an independent firm are required for this project, the Contractor shall employ and pay for services of an independent testing agency or laboratory acceptable to Owner to perform specified testing.

1. Prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full time specialist and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.

B. The independent firm will perform tests, inspections and other services specified in individual specification sections and as required by Engineer.
1. Laboratory Staff: Maintain full time specialist on staff to review services.
2. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.

C. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Engineer.

D. Reports will be submitted by independent firm to Engineer and Contractor, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
   1. Submit final report indicating correction of Work previously reported as non-compliant.

E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Engineer and independent firm 24 hours prior to expected time for operations requiring services.
   2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

F. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

G. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Engineer. Payment for re-testing or re-inspection will be by Contractor.

H. Agency Responsibilities:
   1. Test samples of mixes submitted by Contractor.
   2. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
   3. Perform specified sampling and testing of products in accordance with specified standards.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or products.
   6. Attend preconstruction meetings and progress meetings.

I. Agency Reports: After each test, promptly submit one copy of report to Engineer, Contractor, and authority having jurisdiction. When requested by Engineer, provide interpretation of test results. Include the following:
   1. Date issued.
   2. Project title and number.
   3. Name of inspector.
   4. Date and time of sampling or inspection.
   5. Identification of product and specifications section.
   6. Location in Project.
   7. Type of inspection or test.
   8. Date of test.
   9. Results of tests.
   10. Conformance with Contract Documents.

J. Limits On Testing Authority:
   1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency or laboratory may not approve or accept any portion of the Work.

K. Agency or laboratory has no authority to stop the Work.

1.7 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of

surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Engineer 20 working days in advance of required observations. Observer is subject to approval of Engineer.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Refer to Section 01 33 00 - Submittal Procedures, MANUFACTURERS' FIELD REPORTS article.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify utility services are available, of correct characteristics, and in correct locations.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 DESCRIPTION

A. This Section covers the work necessary to mobilize the personnel, equipment, and facilities required to prepare and maintain the work area in a manner suitable for construction. Temporary facilities and controls required for this work include, but are not limited to:

1. Temporary utilities such as water and electricity

2. Sanitary facilities

3. Survey Control

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for this item shall be included in the Mobilization/Demobilization Bid Item, or other appropriate Bid Item. No additional measurement or payment will be included for the requirements in this section.

1.3 PRODUCT HANDLING

A. Protection:

1. Use all means necessary to maintain temporary facilities and controls in proper and safe condition throughout progress of the work.

1.4 SUBMITTAL REQUIREMENTS

A. Section 01 33 00 – Submittal Procedures.

1.5 TEMPORARY UTILITIES

A. Temporary Water

1. Contractor to coordinate with Owner regarding temporary water, which the Owner will provide free of charge.

2. Contractor to request Owner to set hydrant meter prior to taking any water.

B. Temporary Electricity

1. Owner supplied temporary electricity is not available onsite, and the Contractor shall provide their own means of electrical power for construction.

C. Temporary Ventilation

1. Ventilate enclosed areas, such as manholes, vaults, and excavations, and other enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

2. Contractor shall comply with all applicable OSHA requirements for working in confined spaces.

D. Temporary Sanitary Facilities

1. Provide and maintain required temporary sanitary facilities and enclosures sufficient to accommodate Contractor and Subcontractor personnel at locations easily accessible from work and in accordance with OSHA 29 CFR 1910.141. Existing facility use is not permitted).

2. Remove and dispose of sanitary wastes off Site on a periodic basis as required and in accordance with applicable Laws and Regulations.

3. Provide facilities at time of project mobilization and protect facilities against vandalism

4. Contractor is responsible for cleaning, maintenance, security, placement and removal of facilities.

1.6 SURVEY CONTROL

A. Horizontal and vertical survey control points shall be used by the Contractor to assist in locating facilities and setting grades. Temporary benchmarks have been set as shown on the Drawings. The Contractor is responsible for setting any additional survey control that may be required.

1.7 REMOVAL OF TEMPORARY FACILITIES AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials prior to completion of Work.

B. Clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 55 26

TEMPORARY TRAFFIC CONTROL SYSTEMS

PART 1 GENERAL

1.1 REQUIREMENT

A. This Section covers the materials, equipment, and labor necessary to furnish, place, and maintain all temporary traffic control systems, including construction and maintenance area traffic control devise and flaggers as required to perform the Work in accordance with this Section, and all other appurtenant Work, complete in place, as shown on the Contract Drawings and as specified herein.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for traffic control shall be included in the Traffic Control Bid Item. No additional measurement or payment will be included for the requirements of this section.

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. General Conditions, Section B-51 – Public Convenience.

B. Humboldt County Public Works Encroachment Permit (to be completed by Contractor). A draft Humboldt County Encroachment permit is included as an Appendix to the Specifications to illustrate requirements for bid purposes.

C. Commercial Standards

1. State of California, Division of Industrial Safety, Department of Industrial Relations.

2. Safety Orders of the Division of Industrial Safety, Department of Industrial Relations of the State of California, current edition.

1.4 SUBMITTALS

A. Contractor shall finalize an Encroachment Permit from Humboldt County Public Works prior to beginning the work. As part of the Encroachment Permit process, the Contract shall prepare traffic control plans for planned work within the public right-of-way for review and acceptance by the County and Engineer. The development and implementation of the traffic control plans shall include, but not necessarily be limited to, traffic controls, signs, and flaggers conforming to the current California MUTCD. The Contractor will be required to submit for review by the County and Engineer a Work Zone Traffic Control Plan that contains only information specifically related to work zone traffic control, including pedestrian traffic control. The items that the Contractor will be required to submit as a part of the Work Zone Traffic Control Plan are anticipated to include, but not necessarily be limited to:

a. Specific details for construction staging, including the location and limits of the work zone.

b. Identification of changeable message board locations.

c. Locations of all excavations.

d. MUTCD compliant pedestrian routing plans and details showing how pedestrians will be routed through the work area.

e. Plans for protection of the public from construction-related hazards.

f. Lane closures and traffic routing including consideration of construction-related trucking routes.

g. A trucking route. The route must minimize traffic on residential streets that are not part of the project.

h. Lane closure markings, barricade locations, and sign locations showing the necessary signing, methods of delineation, and channelization, and reference to the appropriate California MUTCD standards and details for all affected roads.

i. Dimensions of lanes affected by traffic control that will be open to traffic.

j. Dimensions and locations of signs and cone tapers.

k. Identification of side streets and driveways affected by construction and how they will be handled.

l. Detail of how public transit will be handled through the construction area.

m. Time periods of lane closures.

B. The Work Zone Traffic Control Plan shall contain a title block which contains the Contractor's name, address, phone number, project superintendent's name, contract name, dates and hours traffic control will be in effect, and a space for review acknowledgment.

C. The Work Zone Traffic Control Plan shall be prepared by a licensed California Civil or Traffic Engineer. The Work Zone Traffic Control Plan and other Encroachment Permit application materials shall be submitted to the Engineer and other affected agencies in conjunction with the County for review.

D. No work will be allowed to commence prior to approval of the Encroachment Permit and Work Zone Traffic Control Plan.

E. A "Letter of Responsibility" shall be submitted on company letterhead, indicating the names and telephone numbers of at least three different persons who shall be available to be contacted in case of emergency at any time during the life of the contract. Said persons must have decision-making authority within the company.

PART 2 PRODUCTS

2.1 GENERAL

A. All construction area stationary and portable sign panels, lights, barricades, and traffic control devices shall be the product of a commercial sign or safety device manufacturer conforming to the requirements of Section 12, "Construction Area Traffic Control Devices," of the Caltrans Standard Specifications, unless otherwise specified in this Section, shown on the Drawings, and/or as directed by the Engineer.

PART 3 EXECUTION

3.1 GENERAL

A. No work in or affecting the public right-of-way shall commence until traffic control signing has been approved by Humboldt County and the Engineer.

B. The Contractor shall provide all appropriate traffic control measures in accordance with this Section prior to start of construction in the public right-of-way or in any area adjacent to the street right-of-way where public safety is affected.

C. The Contractor shall take all necessary precautions for the protection of the Work and the safety of its employees and the public.

D. The Contractor shall be responsible for developing a plan that is in conformance with the Humboldt County encroachment permit and the County's requirements.

E. Field changes to traffic control plans shall be approved by the Engineer and the County prior to installation.

F. When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 10 feet without written approval from the Engineer and the County.

G. All construction area signs, lights, barricades, and traffic control devices shall be furnished, installed, maintained, and removed in conformance with the latest edition of the California MUTCD. Additional or alternate signs may only be used when specifically authorized by the Engineer.

H. The Contractor shall monitor traffic and safety conditions and maintain adequate traffic control measures during both work and non-work hours in order to maintain compliance with the requirements of this Section.

I. The Contractor shall conform to all requirements of the current "Safety Orders of the Division of Industrial Safety, Department of Industrial Relations of the State of California."

J. If a hazardous condition is observed and the Engineer notifies the Contractor either directly or by telephone, the Contractor shall correct the condition immediately. If the Contractor fails to correct the hazardous condition immediately, the District reserves the right to call in a local contractor to perform the necessary work needed to improve public safety. The cost incurred shall be withheld from the Contractor's pay. Should the Engineer point out any inadequacy of warning and protective measures, such action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety nor abrogate the Contractor's obligation to furnish and pay for these devices.

K. All construction area signs, lights, barricades, and temporary traffic control devices shall be completely removed from the roadway when not in use. Locations and methods of storing traffic control equipment adjacent to the roadway between interrupted use shall require prior approval of the Engineer.

L. The Contractor shall completely remove all temporary signs, striping and/or delineators and restore the pavement, as necessary, upon removal or relocation of any temporary traffic controls or constructed as part of the Work.

M. Temporary traffic control measures shall be in effect only during work hours. Normal traffic routing shall be reestablished at the end of each workday whenever possible.

N. Contractor shall conduct operations as to offer the least possible obstruction and inconvenience to the public and shall have under construction no greater amount of work than can be prosecuted properly with due respect to the rights of the public. Contractor shall provide personal advance notice to each affected resident or business informing them of impending work and provide ample time to remove vehicles and estimated time of driveway closure. This shall be accomplished by delivering a notice to all houses or businesses to be affected by the impending work. The notice shall be typed and signed by the Contractor or the Contractor's designated superintendent. The format and contents of the notice shall be approved by the Engineer prior to commencement of the Work.

O. Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners. Convenient access to driveways, houses, and buildings along the line of the work shall be maintained, and temporary approaches to crossings or intersecting roads shall be provided and kept in good condition.

P. Whenever the Contractor's operations create a condition hazardous to the public, furnish, erect, and maintain such fences, barricades, lights, signs and other devices as are necessary to prevent accidents or damage or injury to the public.

Q. Should the Contractor appear to be neglectful or negligent in furnishing warning and productive measures as above specified, the Engineer may direct attention to the existence of hazard, and the necessary warning and protective measures shall be furnished and installed by the Contractor at Contractor's expense, without cost to the Owner. Should the Engineer point out any inadequacy of warning and protective measures, such action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety nor abrogate his obligation to furnish and pay for these devices.

R. Under no circumstances shall access to businesses or residences be held up more than fifteen (15) minutes at any one time. The Contractor may coordinate with property and business owners to schedule work so that delays longer than 15 minutes do not adversely affect residents or business owners to their satisfaction. In addition, Contractor shall give personal notice to all affected property owners as specified in paragraph N, hereinbefore. No streets shall be closed to through traffic at any time. Contractor shall at all times provide access to public facilities such as schools, etc. and make provisions for passage of emergency vehicles.

3.2 PEDESTRIAN TRAFFIC

A. The Contractor is directed to Chapter 6D, Pedestrian and Worker Safety, in the California MUTCD, the Drawings, and these Specifications.

B. Pedestrians shall be provided with a safe, convenient and accessible path that, at a minimum, replicates the most desirable characteristics of the existing path.

C. The Contractor shall construct and maintain temporary pedestrian pathways through the work zone, where required, that shall be in compliance with the requirements of California MUTCD.

D. Pedestrian routes shall not be impacted for the purposes of any non-construction activities such as parking of vehicles or equipment, or stock piling of materials. Pedestrians shall not be led into conflicts with work site vehicles, equipment or operations.

END OF SECTION

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SECTION 01 55 60

TEMPORARY SEWAGE BYPASS PUMPING SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION

A. Section includes requirements for implementing a temporary pumping system for the purpose of diverting existing sewage flow around work areas as required.

B. The Contractor is required to provide their own pumps and power/fuel for bypass pumping.

C. The Contractor is responsible for monitoring functioning of the bypass system and sewage levels in manholes during bypassing operations.

D. Any temporary facilities installed for bypass pumping shall be removed at the completion of work and the area shall be restored including the requirement for any hot mix paving repair, concrete sidewalk repairs, or other restoration.

E. Contractor may propose any method that meets the requirements of these specifications. Contractor is responsible for developing, implementing, maintaining, and removing a temporary bypass pumping system that meets these specifications.

F. Bypass of untreated or partially treated sewage to surface waters or drainage courses is prohibited during construction. In the event of accidental bypassing to surface waters or drainage courses, the Owner shall immediately be entitled to employ others to stop the bypassing without giving written notice to the Contractor. If a Contractor-initiated bypass to surface waters or drainage courses occurs, the Contractor will pay all expenses incurred by the Owner and any fines imposed by the State and Federal agencies, courts, and third-party suits.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for temporary bypass pumping systems shall be included in the Temporary Sewer Bypass Pumping Bid Item. No additional measurement or payment will be included for the requirements for this section.

1.3 QUALITY ASSURANCE

A. Follow national standards and as specified herein.

B. Perform leakage and pressure tests on discharge piping using clean water before operation. Notify Engineer 24 hours prior to testing.

C. Maintain and inspect temporary pumping system every two hours. Responsible operator: on site when pumps are operating.

D. Keep and maintain spare parts for pumps and piping on site, as required.

E. Maintain adequate hoisting equipment and accessories on site for each pump.

1.4 SUBMITTALS

A. Section 01 33 00 – Submittal Procedures.

B. Detailed plan and description of proposed pumping system. Indicate number, size, material, location and method of installation of suction and discharge piping, size of pipeline or conveyance system to be bypassed, staging area for pumps, site access point, and expected flow.

1. Size and location of manhole or access points for suction and discharge hose or piping.

2. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill, if buried.

3. Temporary pipe supports and anchoring required.

4. Thrust and restraint block sizes and locations.

5. Sewer plugging method and type of plugs.

6. Bypass pump sizes, capacity, number of each size to be on site and power requirements. Contractor may tap into existing power for pump station.

7. Backup pump, power and piping equipment.

8. Calculations of static lift, friction losses, and flow velocity. Pump curves showing pump operating range.

9. Design plans and computation for access to bypass pumping locations indicated on drawings.

10. Calculations for selection of bypass pumping pipe size.

11. Method of noise control for each pump and/or generator.

12. Method of protecting discharge manholes or structures from erosion and damage.

13. Schedule for installation and maintenance of bypass pumping lines.

14. Procedures to monitor upstream mains for backup impacts.

15. Procedures for setup and breakdown of pumping operations.

16. Emergency plan detailing procedures to be followed in event of pump failures, pipe failures, sewer overflows, service backups, and sewage spillage.

    a. Maintain copy of emergency plan on site for duration of project.

1.5 CONTRACTOR'S RESPONSIBILITY FOR OVERFLOWS AND SPILLS

A. Schedule and perform work in manner that does not cause or contribute to incidence of overflows, releases or spills of sewage from sanitary sewer system or bypass operation.

1.6 DELIVERY AND STORAGE

A. Transport, deliver, handle, and store pipe, fittings, pumps, ancillary equipment and materials to prevent damage and following manufacturer's recommendations.

1. Inspect all material and equipment for proper operation before initiating work.

B. Material found to be defective or damaged due to manufacturer or shipment.

1. When Engineer deems repairable: Repair as recommended by manufacturer.

2. When Engineer deems not repairable: Replace as directed by Engineer before initiating work.

PART 2 PRODUCTS

2.1 MATERIALS

A. Discharge and Suction Pipes: Approved by Engineer.

1. Discharge piping: Determined according to flow calculations and system operating calculations.

2. Suction piping: Determined according to pump size, flow calculations, and manhole depth following manufacturer's specifications and recommendations.

B. Polyethylene Plastic Pipe:

1. High density solid wall and following ASTM F714 Polyethylene (PE) Plastic Pipe (SDR-DR) based on Outside Diameter, ASTM D1248 and ASTM D3550.

2. Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

C. High Density Polyethylene (HDPE).

1. Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

2. Defective areas of pipe: Cut out and joint fused as stated herein.

3. Assembled and joined at site using couplings, flanges or butt-fusion method to provide leak proof joint. Follow manufacturer's instructions and ASTM D 2657.

4. Threaded or solvent joints and connections are not permitted.

5. Fusing: By personnel certified as fusion technicians by manufacturer of HDPE pipe and/or fusing equipment.

6. Butt-fused joint: True alignment and uniform roll-back beads resulting from use of proper temperature and pressure.

7. Allow adequate cooling time before removal of pressure.

8. Watertight and have tensile strength equal to that of pipe.

9. Acceptance by Engineer before insertion.

10. Use in streams, storm water culverts and environmentally sensitive areas.

D. Flexible Hoses and Associated Couplings and Connectors.

1. Abrasion resistant.

2. Suitable for intended service.

3. Rated for external and internal loads anticipated, including test pressure.

a. External loading design: Incorporate anticipated traffic loadings, including traffic impact loading.

4. When subject to traffic loading, compose system, such as traffic ramps or covers.

a. Install system and maintain H-20 loading requirements while in use or as directed by the Owner

E. Valves and Fittings: Determined according to flow calculations, pump sizes previously determined, and system operating pressures.

F. Plugs: Selected and installed according to size of line to be plugged, pipe and manhole configurations, and based on specific site.

G. Additional plugs: Available in the event a plug fails. Plugs will be inspected before use for defects which may lead to failure.

H. Aluminum “irrigation type” piping or glued PVC piping will not be permitted.

I. Discharge hose will only be allowed in short sections when approved by Owner.

2.2 EQUIPMENT

A. Pumps.

1. Fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in priming system.

2. Electric or diesel powered.

3. Constructed to allow dry running for long periods of time to accommodate cyclical nature of effluent flows.

4. Provide.

a. Necessary stop/start controls for each pump.

b. One standby pump of each size maintained on site.

1) On-line, isolated from primary system by a valve.

c. Quiet flow pumps at request of Owner.

2.3 DESIGN REQUIREMENTS

A. Bypass pumping systems:

1. Sufficient capacity to pump average dry weather flow of 30-gpm and peak wet weather flow of 120-gpm. Provide backup pump if needed.

2. Operate 24 hours per day if necessary.

B. Provide pumps that will handle flow in the system using the average flow data as a basis with consideration for diurnal and weather peaking factors.

C. Total Dynamic Head to be determined by the Contractor based on manhole invert elevations shown on Drawings, discharge pipe installation elevation, bypassing length, and temporary hose/pipe size provided by Contractor.

D. Provide pipeline plugs and pumps of adequate size to handle peak flow, and temporary discharge piping to ensure total flow of mains can be safely diverted around work area.

PART 3 EXECUTION

3.1 PREPARATION

A. Determining location of bypass pipelines.

1. Minimal disturbance to existing utilities.

a. Field locate existing utilities in proposed bypass area.

2. Obtain approvals for placement within public or private property.

3. Obtain Engineer’s approval of location and configuration.

3.2 INSTALLATION AND REMOVAL

A. Provisions and requirements must be reviewed by Engineer before starting construction.

B. Make connections to existing sewer and construct temporary bypass pumping structures at manhole locations and as required to provide adequate suction conduit. Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, remove in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

C. When working inside manhole, exercise caution. Follow OSHA, Local, State and Federal requirements. Take required measures to protect workforce against sewer gases and/or combustible or oxygen-deficient atmosphere.

D. Installation of Bypass Pipelines:

1. Pipeline may be placed along shoulder of roads.

a. Do not block streets or sidewalks.

2. When bypass pipeline crosses local streets and private driveways, place in roadway ramps.

a. When roadway ramps cannot be used, place bypass in trenches and cover with temporary pavement as approved by Owner.

E. During bypass pumping operation, protect sewer lines from damage inflicted by equipment.

F. Upon completion of bypass pumping operations, and after the receipt of written permission from Owner, remove piping, restore property to pre- construction condition and restore pavement.

3.3 MONITORING

A. Monitor manholes that are plugged for bypassing operations throughout the workday so that overflows do not occur.

B. Each section of liner installed shall be cured and operational by the end of each working day so that bypass pumping is not required during non-working hours. If bypassing is ever required during non-working hours, arrange for remote monitoring so that a high level alarm notifies the Contractor, or maintain constant on-site monitoring.

C. Contractor is responsible for cleaning up any overflows that occur during bypassing operations to the satisfaction of the Engineer.

D. Contractor is responsible for paying any fines/penalties that are imposed if any overflows occur during bypassing operations.

END OF SECTION

SECTION 01 57 13

EROSION CONTROL

PART 1 GENERAL

1.1 GENERAL

A. Minimize the extent of all ground-disturbing activities and avoid Work in any drainage channels if at all feasible.

B. Heavy equipment shall be placed outside of drainage channels except when absolutely necessary to perform the Work.

C. Upon completion of construction activities, natural drainage shall be restored and recontoured as nearly as practicable to pre-project conditions and shall match adjacent natural channel contours.

D. In addition to ongoing erosion control measures, all disturbed areas resulting in bare earth shall be treated with seed and straw upon completion of the project. Seed shall be per Caltrans standards for roadside seeding in the project region. Seed shall be applied at a minimum rate of 100 pounds per acre. All disturbed areas shall be covered with straw by hand broadcasting at an application rate so that no earth can be seen through the straw.

1.2 RELATED SECTIONS

Related work specified in other sections:

A. Section 01 57 19 – Environmental Requirements

1.3 MEASUREMENT AND PAYMENT

A. Measurement and payment for erosion control shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.4 SUBMITTALS

A. Mill Certificate or Affidavit. A mill certificate or affidavit shall be provided attesting that the fabric and factory meet chemical, physical, and manufacturing requirements specified below.

B. Proposed Seed Mix

C. Soil Erosion and Sediment Control Plan

1.5 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. ASTM D4439 – Standard Terminology for Geosynthetics.

2. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

3. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.

4. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

5. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile.

6. ASTM D4873 - Standard Guide for

C. California State Water Resources Control Board:

1. National Pollutant Discharge Elimination System (NPDES) General Permit Discharge from Construction Activities.

1.6 EROSION AND SEDIMENT CONTROLS

A. The controls and measures required of the Contractor are described but not limited to the below.

1. Structural Practices: Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Structural practices shall include the following devices.

a. Silt Fences. The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly placed and installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, trench excavation, backfilling, and grading). Silt fences shall be installed in the locations as directed by the Engineer. Final removal of silt fence barriers by the Contractor shall be upon approval of the Engineer.

b. Fiber Rolls (sediment logs or wattles): Contractor shall provide fiber rolls as temporary structural practice to minimize erosion and sediment runoff. Fiber rolls shall be properly placed and installed to effectively retain sediment immediately after completing each phase of work (e.g., clearing and

grubbing, trench excavation, backfill, and grading) in each independent runoff area (e.g., after clearing and grubbing in an area between a ridge and drain, fiber rolls shall be placed as work progresses; fiber rolls shall be removed/replaced/relocated as needed for work to progress in the drainage area). Final removal of fiber roll barriers by the Contractor shall be upon approval by the Engineer. Fiber Rolls shall be provided as follows, or as required to conform to the intent of this section:

1) Along the downhill perimeter edge of all areas disturbed.
2) Along the top of the slope or top bank of drainage ditches, channels, swales, etc. that traverse disturbed areas.
3) Along the toe of all cut slopes and fill slopes of the construction areas.
4) Perpendicular to the flow in the bottom of existing drainage ditches, channels, swales, etc. that traverse disturbed areas or carry runoff from disturbed areas. Rows shall be spaced a maximum of 100 feet apart.
5) Perpendicular to the flow in the bottom of new drainage ditches, channels, and swales. Rows shall be spaced a maximum of 100 feet apart.
6) At the entrance to culverts that receive runoff from disturbed areas.

c. To minimize wildlife entanglement and plastic debris pollution, the use of plastic netting (such as polypropylene, nylon, polyethylene, polyester, or other synthetic fibers used in fiber rolls, erosion control blankets, and mulch control netting) in temporary rolled erosion and sediment control products is prohibited. Any erosion control associated netting shall be made of natural fibers and constructed in a loose-weave design with movable joints between the horizontal and vertical twines.

PART 2 PRODUCTS

2.1 SILT FENCES

A. Ultraviolet stabilized woven polypropylene face. The filter fabric shall meet the following requirements:

Physical Property	Test Procedure	Required Value
Grab Tensile	ASTM D 4632	160 lbs. min.
Elongation (%)	ASTM D 1682	25 % max.
Mullen Burst Strength, psi, min.	ASTM D 3876	350
Equivalent Opening Size, max.	US Standard Sieve	30-70
Ultraviolet Radiation Resistance, % Strength Retention	ASTM D 4355	70
Weight oz./sq. yd.	ASTM D 3776	4

B. Mill Certificate or Affidavit. A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above.

C. The Contractor may use either wooden stakes or steel posts for silt fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot.

2.2 FIBER ROLLS (sediment logs or wattles)

A. Composed of certified weed free rice straw or coconut fiber in 8.5 to 9-inch diameter rolls with and approximate weight of 2lbs/lineal foot, contained in a core, jute, or burlap netting.

B. Manufacturers:

1. Earth Savers 9”-Coir Log

2. Erosion Control Blanket, 9-inch Stenlog

3. Substitutions: Section 01 60 00 - Product Requirements.

C. The Contractor shall use wooden stakes for fiber roll installation. Wooden stakes used for fiber roll installation shall have a minimum cross section of 1 inch by 2 inches, or as suggested by the fiber roll manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

A. Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Engineer.

B. Maximum spacing for post supports shall be 6 feet on center. Posts shall be buried 12 inches minimum and shall not exceed 36 inches above the ground surface.

3.2 INSTALLATION OF FIBER ROLLS (sediment logs or wattles)

A. Fine grade the subgrade by hand, dressing where necessary to remove local deviations and to remove larger stones or debris that will inhibit intimate contact of the fiber roll with the subgrade. Prior to roll installation, contour a concave key trench 2 to 4 inches deep along the proposed installation route. Soil excavated in trenching should be placed on the uphill or flow side of the roll to prevent water from undercutting the roll.

B. Place fiber rolls into the key trench and stake on both sides of the roll within 6 feet of each end. Spacing for stakes shall be 3 to 5 feet. Stakes are typically driven in on alternating sides of the roll. Stakes shall be buried 12 inches minimum.

C. When more than one fiber roll is placed in a row, the rows shall be abutted securely to one another to provide a tight joint, not overlapped. Fiber rolls shall be placed in a single row, lengthwise on the contour, with ends of adjacent rolls tightly abutting one another.

3.3 MAINTENANCE

A. The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

1. Silt Fence Maintenance. Silt fences shall be inspected in accordance with PART 4. Any required repairs shall be made promptly. Close attention shall be given to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be re-vegetated to match pre-disturbance conditions.

2. Fiber Roll Maintenance. Fiber roll barriers shall be inspected in accordance with PART 4. Close attention shall be given to the repair of damaged rolls, end runs and undercutting beneath rolls. Necessary repairs to barriers or replacement of rolls shall be accomplished promptly. Sediment deposits shall be removed when deposits reach one-half of the height of the barrier. Roll rows used to retain sediment shall be turned uphill at each end of each row. When a fiber roll barrier is no longer required, it shall be removed. The immediate area occupied by the roll and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be re-vegetated.

PART 4 INSPECTION

4.1 INSPECTIONS BY REGULATORY AGENCIES

A. Allow Regional Water Quality Control Board, or any authorized representative of this or other applicable agencies, to conduct the following activities at reasonable times:

1. Enter onto areas of the site, including any construction support activity areas, and onto locations where records are kept.

2. Access and copy any records that must be kept under the conditions of this Specification section;

3. Inspect the construction site, including any construction support activity areas covered by this Contract and any stormwater controls installed and maintained at the site; and

4. Sample or monitor for the purpose of ensuring compliance.

PART 5 CORRECTIVE ACTION

5.1 "CORRECTIVE ACTIVE" DEFINED

A. Corrective actions are actions taken in compliance with this Specification section, which include:

1. Repair, modify, or replace any stormwater control used at the site;

2. Clean up and properly dispose of spills, releases, or other deposits; or

3. Remedy a permit violation

5.2 REQUIREMENTS FOR TAKING CORRECTIVE ACTION

A. Contractor must complete the following corrective action in accordance with the deadlines specified in this Part. In all circumstances, Contractor must immediately take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational, including cleaning up any contaminated surfaces so that the material will not discharge in subsequent storm events.

B. For any of the following conditions on the site, Contractor must install a new or modified erosion control measure and make it operational, or complete the repair, but no later than seven (7) calendar days from the time of discovery. If it is infeasible to complete the installation or repair within seven (7) calendar days, Contractor must document in their records why it is infeasible to complete the installation or repair within seven (7) calendar days and document the schedule for installing the stormwater control(s) and making it operational as soon as practicable after the seven (7) day timeframe.

1. A required storm water control was never installed, was installed incorrectly, or not in accordance with the requirements of Section 01 57 13.

2. If the Contactor determines that erosion control measures installed are not effective enough for the discharge to meet applicable water quality standards.

3. Any of the prohibited discharges listed below are occurring or has occurred:

a. Wastewater from washout of concrete or slurry, unless managed by an appropriate control.

b. Wastewater from washout and cleanout of any other construction materials, unless managed by an appropriate control.

c. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.

d. Soaps, solvents, or detergents used in vehicle and equipment washing.

e. Drilling muds, or toxic or hazardous substances from a spill or other release.

5.3 CORRECTIVE ACTION REQUIRED BY REGULATORY AGENCY

A. Contractor must comply with any corrective actions required by the State as a result of an inspection carried out under Part 4.2.

END OF SECTION

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SECTION 01 57 19

ENVIRONMENTAL REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes mitigation and project measures to reduce or avoid adverse effects, resulting from construction of the project.

B. Related Sections

1. Section 01 50 00 Temporary Facilities and Controls
2. Section 01 55 60 Temporary Sewage Bypass Pumping System
3. Section 01 57 13 Erosion Control
4. Section 01 74 00 Site and Area Cleanup
5. Section 31 23 19 Dewatering

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for the items addressed in this Section shall be included in the Bid Item to which they relate. No additional measurement or payment will be included for the requirements of this section.

1.3 DEFINITIONS

A. Project Measures: Measures and practices are included as part of the Project to reduce or avoid adverse effects that could result from construction.

B. Mitigation Measures: Measures and practices are included as part of the Project to reduce or avoid adverse effects that could result from construction or operation of the project and require monitoring and checking for compliance prior, during, and/or following construction.

1.4 SUBMITTALS

A. As required in Related Sections.

B. Fire Safety Plan.

PART 2 PRODUCTS

2.1 PRODUCTS

A. The use of rodenticides containing any anticoagulant compounds including, but not limited to Warfarin, Bromadiolone, Brodifacoum, or Diphacinone is prohibited.

B. The use of herbicides is prohibited.

PART 3 EXECUTION

3.1 PROJECT-WIDE MEASURES:

A. **Implement Air Quality Emission Control Measures during Construction**. The principal concern about the effect of construction projects on air quality relates to the potential for earthwork and other activities to generate dust, including inhalable particulate matter (PM_{10}) that poses a human health hazard. To address the potential for dust generation, the Contractor will be required to implement the following BMPs. These measures will also apply to ground disturbing maintenance activities and equipment exhaust:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered twice per day, and additionally as necessary during dusty conditions or as directed by the Engineer.

2. Erosion control measures must be employed to prevent water runoff containing silt and debris from entering drainage ways;

3. All haul trucks transporting soil, sand, or other loose material on- or off-site shall be covered;

4. Sweep paved access roads and parking areas daily. The use of dry power sweeping shall be prohibited;

5. All visible mud or dirt tracked out onto adjacent public roads shall be removed using wet power vacuum street sweepers as needed. The use of dry power sweeping shall be prohibited;

6. All vehicle speeds on unpaved areas shall be limited to 15 miles per hour;

7. All paving shall be completed as soon as possible after other work is finished;

8. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations);

9. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

B. **Erosion Control**. The following erosion control measures shall be implemented by the construction Contractor to prevent soil erosion and sedimentation during construction. Erosion and sediment control measures will be in effect and maintained by the Contractor on a continuous basis until all disturbed areas are stabilized.

1. Stockpiled material will be covered or watered to eliminate excessive dust, as necessary.

2. Fiber rolls, silt fences, or similar products will be utilized in appropriate locations to reduce sediment runoff from disturbed soils, as necessary.

3. A stabilized construction entrance will be maintained to minimize tracking of mud and dirt from construction vehicles onto public roads.

4. Storm drain inlets receiving storm water runoff will be equipped with inlet protection, as necessary.

5. A concrete washout area will be designated to clean concrete trucks and tools, if necessary. The washout area shall be located at least 100 feet from all waters, drainage courses, and storm drain inlets and shall be implemented in a manner that controls runoff and prevents leaching to underlying soils.

6. Refer to Section 01 57 13 – Erosion Control for additional BMPs and requirements.

C. **Construction Schedule.** Work hours shall be limited to Monday through Saturday. Construction outside of these hours, on Sunday, or legal or County holidays shall not be allowed without prior approval from the Engineer.

D. **Site Restoration and Demobilization**. Following construction, the contractor shall demobilize and remove all equipment, supplies, and construction wastes. Disturbed areas shall be revegetated, and final erosion and sediment controls shall be installed. All disturbed areas of the project site shall be restored to original pre-construction conditions.

E. **Groundwater Dewatering**: If required, temporary groundwater dewatering shall be conducted to provide a dry work area. Groundwater shall be pumped to a percolation area consisting of a hay bale perimeter to allow it to infiltrate back into the soil (or other method proposed by the Contractor). The Contractor shall submit a dewatering plan for review and approval by the Engineer. The Contractor may also:

1. Reuse the water on-site for dust control, compaction, or irrigation, as appropriate.

2. Retain the water on-site in a grassy or porous area to allow infiltration/evaporation.

Refer to Section 31 23 19 – Dewatering for additional BMPs and requirements.

3.2 SITE SPECIFIC MITIGATION MEASURES:

A. Cultural Resources

1. **Identify and Avoid or Minimize Impacts to Unknown Historic and/or Archaeological Resources**. The Contractor shall ensure that if concentrations of prehistoric or historic-period materials are encountered as a result of ground-disturbing activity attributable to the Project, all work in the immediate vicinity shall halt until a qualified archaeologist can evaluate the finds and make recommendations. The recommendations of the archaeologist shall be implemented.

Prehistoric materials could include:

- obsidian and chart flakes or lithic materials
- grinding implements (e.g., pestles, handstones, mortars, slabs)
- bedrock outcrops and boulders with mortar cups
- locally darkened midden
- deposits of shell, dietary bone, and human burials

Historic materials could include:

- ceramics/pottery
- glass, metal, can and bottle dumps

- cut bone
- barbed wire fences
- building pads
- structures
- trails/roads
- railroad rails and ties, trestles, etc.

If such materials are encountered during construction, the Contractor shall immediately halt all Work in the vicinity and notify the Engineer. The District shall retain a qualified archaeologist who shall be present during subsequent surface and subsurface activities in the vicinity of the sensitive materials as determined necessary by the archaeologist. With respect to these areas of sensitive materials:

- Ground disturbance shall be monitored by a qualified archaeologist with the authority to temporarily halt work and redirect equipment if cultural materials are discovered.

- If cultural resources, such as chipped or ground stone, historic-era debris, building foundations, or bone are discovered during ground-disturbances, the Contractor shall stop Work within 20 meters (66 feet) of the discovery, per the requirements of CEQA (Title 14 CCR §15064.5[f]) and Section 106 (36 CFR 800).

- If cultural materials are discovered, the archaeologist shall asses the discovery to determine if it constitutes either a unique archaeologist resource or a historical resource for purpose of the CEQA (Title 14 CCR §15064.5[a]).

- If the archaeologist determines that the materials do not constitute either a unique archaeological resource or a historical resource, their presence shall be noted but need not be considered further (Title 14 CCR §15064.5[c] [3]).

- If the archaeologist determines: (a) that the materials do constitute a unique archaeological resource or historical resource; and, (b) they are subject to substantial adverse change as defined in CCR Title 14 §15064.5[b], the archaeologist shall provide recommendations to the District for appropriate treatment which, among other options, may include preservation in place or archaeological data recovery. Preservation in place is preferred if it is feasible.

Any additional Work requirements due to changes in alignment, re-excavation, and standby time will be paid for under a negotiated change order.

2. **Evaluation and Treatment of Paleontological Resources**. If paleontological resources (e.g. vertebrate bones, teeth, or abundant and well-preserved invertebrates or plants), are encountered during construction, the Contractor shall ensure work in the immediate vicinity shall be diverted away from the find until a professional paleontologist assesses and salvages the find, as appropriate.

   If such materials are encountered during construction, the Contractor shall immediately halt all Work within 50 feet of the find and notify the Engineer. The District shall retain a qualified paleontologist to assess and salvage the find.

Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the material, if it is determined that the find cannot be avoided. The paleontologist shall make recommendations for any necessary treatment that is consistent with currently accepted scientific practices. Any fossils collected from the area shall then be deposited in an accredited and permanent scientific institution where they will be properly curated and preserved.

Work shall not proceed until the Contractor receives written clearance to proceed from the District. The Contractor shall continue Work in other areas of the Project during the Stop Work Order, and it is not anticipated that additional payment shall be required; however, if Work in other areas is impossible, standby time shall be paid for under a negotiated change order and per the General Conditions.

3. **Procedures regarding Encountering Human Remains**. Human remains may be encountered, given the reported presence of prehistoric sites in the vicinity. If human remains, associated grave goods, or items of cultural patrimony are encountered during construction, the following procedures shall be followed as required by Public Resources Code § 5097.9 and Health and Safety Code § 7050.5:

   a. The Contractor shall halt the Work at the discovery location, within 20 meters (66 feet), and any nearby area reasonably suspected to overlie adjacent to human remains (Health and Safety Code, Section 7050.5).

   b. The Humboldt County Coroner must be immediately contacted at the Coroner's office, Ernie Stewart, 3012 I Street, Eureka, CA 95501; Phone 707 445-7242.

   c. The Engineer will be notified.

   d. If the coroner determines that the remains are of Native American origin, the Coroner will notify the Native American Heritage Commission (NAHC) within 24 hours of identification. The NAHC will contact the most likely descendant (MLD).

   e. The MLD has 48 hours after contact to inspect the site of the discovery of the human remains and make recommendations for their treatment and disposition, with appropriate dignity, of the human remains and any associated grave goods, as provided in PRC 5097.98.

   f. If the NAHC is unable to identify a descendant, the descendant fails to make a recommendation, or the landowner refuses the descendants recommendation, the landowner is required to reinter the remains and burial items with appropriate dignity on the property in a location not subject to further disturbance (PRC 5097.98 [b]).

   g. A qualified archaeologist, the Contractor, Owner, and the MLD shall make all reasonable efforts to develop an agreement for the treatment, with appropriate dignity, of any human remains and associated or unassociated funerary objects. The agreement would take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, and final disposition of the human remains and associated or unassociated funerary objects.

4. **Protect Tribal Cultural Resources during Construction Activities.** In the event that any tribal cultural resources are discovered during construction-related earth-moving activities:

    a. The Contractor shall halt all ground-disturbing activity in the vicinity of the resources

    b. An appropriate tribal representative(s)/archaeologist shall be notified

    c. If the find is determined to constitute a tribal cultural resource per Public Resources Code Section 21074, the appropriate tribal

    d. representative(s)/archaeologist shall develop appropriate mitigation to protect the integrity of the resource and ensure that no additional resources are affected.

    e. Mitigation could include but would not necessarily be limited to avoidance, preservation in place, archival research, subsurface testing, or excavation and data recovery.

B. Hazards and Hazardous Materials

1. **Contaminated Materials Handling and Disposal.** Not anticipated for this project. The District shall retain a qualified consultant to recommend actions in accordance with the Comprehensive Environmental Response, Compensation and Liability Act to reduce the risk of handling contaminated soil or groundwater during construction. If potentially contaminated soils or groundwater are encountered during construction (based on visual discoloration or odors observed) then recommended actions may include, but are not limited to:

    a. Soil excavated shall be stockpiled and characterized to determine suitability for re-use at the site or to determine appropriate methods of disposal off-site;

    b. Groundwater generated from dewatering of excavations shall be containerized for chemical analysis, and depending on analytical results, shall be discharged to an approved offsite facility for treatment.

2. **Fire Safety Plan.** The Contractor shall develop and implement a Fire Safety Plan for use during Project construction. The Fire Safety Plan shall be submitted to the District and the Arcata Fire District for review and approval prior to commencement of construction. The Fire Safety Plan shall contain the following requirements:

    a. Fires shall be immediately reported to 911, Arcata Fire Protection District, the Fieldbrook Volunteer Fire Department, Blue Lake Volunteer Fire Department, the Engineer and the Owner.

    b. The construction Contractor shall maintain fire toolbox pursuant to California Code – Section 4428.

    c. Fire safety measures shall be posted for the duration of construction on the project bulletin board at the Contractor’s field office of other central location and areas visible to employees.

d. All internal combustion engines used at the project site shall be equipped with spark arresters in working order, as applicable.

e. Mufflers on motor vehicles shall be maintained in good working order and motor vehicles shall only be used off-road if the area has been cleared of vegetation.

f. Equipment parking areas and small stationary engine sites shall be cleared of all flammable materials.

g. Personnel shall be trained in the practices of the Fire Safety Plan relevant to their duties.

h. Smoking shall be limited to approved areas cleared of all combustible vegetation.

3. **Asbestos Cement Pipe**. Much of the existing sewer and water main that the Contractor will be connecting to is asbestos cement (AC) pipe. The Contractor will be required to cut into the existing AC pipe to make the connections. It is the Contractor's responsibility to provide qualified personnel to perform this work, and all work must be completed in accordance with OSHA standards and all other applicable health and safety standards, codes, and regulations. AC pipe shall be disposed of by the Contractor in accordance with all applicable standards, codes, and regulations.

   Removal or impaction of AC piping shall be in accordance with applicable and regulations, including 8CCR1529. Contractor(s) impacting AC pipe shall hold appropriate licensure to conduct the work. Contractor(s) must provide appropriate training and personal protective equipment to workers exposed to asbestos. At minimum, training shall be in accordance with 8CCR1529(r)(1) and 8CCR5194. Training per 8CCR5194 must include all hazards to which the contractor's workers are exposed. Personal protective equipment shall be appropriate for the airborne asbestos exposures generated by the work and selected in accordance with 8CCR1529. Supervisors involved in AC pipe work shall be trained and certified by an AC pipe training program approved by Cal/OSHA.

4. **Confined Spaces and Hydrogen Sulfide Gas**. The Contractor will be required to enter confined spaces to perform the work required for this project. Because the work will occur on a wastewater system, it is possible that hydrogen sulfide gas will be present. It is the Contractor's responsibility to ensure that only qualified personnel shall be allowed to enter confined spaces, and that personnel shall be equipped with proper hydrogen sulfide monitoring equipment. All safety precautions for confined space entry and hydrogen sulfide gas monitoring dictated by OSHA and all other applicable standards, codes, and regulations shall be adhered to by Contractor personnel at all times.

5. **Pedestrian Traffic**. The work will occur on Central Avenue from Sutter Road to Hiller Road in McKinleyville, CA. Central Avenue has pedestrian and bicycle traffic, and the Contractor is responsible for ensuring public safety at all times throughout the project.

C. Hydrology and Water Quality

1. BMPs to be Implemented During Construction

a. At all times during construction activities, the Contractor shall minimize the area disturbed by excavation, grading, or earth moving to prevent the release of excessive fugitive dust. During periods of high winds (i.e., wind speed sufficient that fugitive dust leaves the site) the Contractor shall cover or treat areas of exposed soil and active portions of the construction site to prevent fugitive dust.

b. No construction materials, equipment, debris, or waste shall be placed or stored where it may be subject to wind or rain erosion and dispersion. Material handling on and offsite shall be required to comply with California Vehicle Code Sec. 23114 with regard to covering loads to prevent materials spills onto public roads.

c. All construction equipment shall be equipped and maintained to meet applicable EPA and CARB emission requirements for the duration of the construction activities.

d. Throughout construction, the Contractor shall maintain adjacent paved areas free of visible soil, sand or other debris.

e. If stockpiled on or offsite, soil and aggregate materials shall be covered with secured plastic sheeting and runoff shall be diverted around them. Stockpiled materials shall be stored a minimum of 100 feet from waterways, concentrated stormwater flows or drainage courses, and storm drain inlets.

f. Drainage courses, creeks, or catch basins shall be protected with straw bales, silt fences, and/or straw wattles.

g. Storm drain inlets shall be protected from sediment-laden runoff with sandbag barriers, filter fabric fences, straw wattles, block and gravel filters, and excavated drop inlet sediment traps.

h. Vehicle and equipment parking and vehicle maintenance shall be conducted in designated areas that are located at least 100 feet from waterways, drainage courses, creeks, and storm drain inlets.

i. Construction vehicle and equipment fueling areas shall be designed to fully contain any spills of fuel, oil, or other contaminants. Equipment that cannot be feasibly relocated to a designated fueling area may be fueled and maintained in other areas of the site provided that procedures are implemented to fully contain any potential spills.

j. Major maintenance, repair, and washing of vehicles and other equipment shall be conducted off-site or in a designated and controlled area.

k. Construction debris, plant and organic material, trash and hazardous materials shall be collected and properly disposed.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products.

B. Product delivery requirements.

C. Product storage and handling requirements.

D. Product options.

E. Product substitution procedures.

F. Equipment electrical characteristics and components.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for requirements of this section shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 PRODUCTS

A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.

B. Do not use materials or equipment removed from existing premises, except as specifically permitted by Contract Documents.

C. Furnish interchangeable components from same manufacturer for components being replaced.

D. Materials and equipment are to be new unless noted otherwise.

1.4 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

D. Arrange deliveries of materials in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site. Deliver materials in undamaged condition, in manufacturer’s original containers or packaging, with identifying labels intact and legible.

Contractor is encouraged to obtain materials in biodegradable or recyclable/reusable packaging which uses the minimum amount of packaging possible.

1.5 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store and protect products in accordance with manufacturers' instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

D. For exterior storage of fabricated products, place on sloped supports above ground.

E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.

H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.6 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit request for substitution for any manufacturer not named in accordance with the following article.

D. The Contractor is encouraged to submit for approval products made out of recycled or environmentally responsible materials.

1.7 PRODUCT SUBSTITUTION PROCEDURES

A. Engineer will consider requests for Substitutions only within 60 calendar days after date established in Notice to Proceed.

B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that Contractor:
   1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
   2. Will provide same warranty for Substitution as for specified product.
   3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.
   5. Will reimburse Owner for review or redesign services associated with re-approval by authorities having jurisdiction.

E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit electronic copy of request for Substitution for consideration. Limit each request to one proposed Substitution.
   2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
   3. Engineer will notify Contractor in writing of decision to accept or reject request.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 70 00

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cleaning during construction.

B. Closeout procedures.

C. Final cleaning.

D. Starting of systems.

E. Demonstration and instructions.

F. Testing, adjusting and balancing.

G. Protecting installed construction.

H. Project record documents.

I. Operation and maintenance data.

J. Spare parts and maintenance products.

K. Product warranties and product bonds.

1.2 CLEANING DURING CONSTRUCTION

A. During construction, the Contractor shall not allow debris to build up in the work area, and shall avoid creating excessive dust at the work site. If excessive dust is being generated, the Contractor shall use water sprays, vacuum sweepers, or other methods or equipment approved by the Engineer to alleviate the problem. Dirt and debris on the roadway shall be kept to a minimum and shall be swept off at the end of each workday.

B. At the end of each working day, the Contractor shall remove accumulations of dust, mud, and other debris from all traveled ways (including sidewalks).

C. If, in the opinion of the Engineer, the Contractor has not sufficiently cleaned the project area, the Engineer shall issue a written notice to the Contractor stating that the Contractor shall clean the project area to the satisfaction of the Engineer within forty-eight (48) hours. If the Contractor does not comply with this notice, the Engineer shall have the option of employing whatever forces deemed necessary to satisfactorily clean the project area. The costs associated with the employment of such forces and the cleanup of the project area shall be paid for solely by the Contractor.

1.3 CLOSEOUT PROCEDURES

A. Closeout Submittals

1. Project Record Drawings: As specified herein.

2. Warranties and Bonds: As specified in individual sections and this Section 01 70 00 Execution Requirements.

B. Substantial Completion and Final Inspection

1. Submit written certification that project, or designated portion of project, is substantially complete, and request in writing a final inspection. Certification shall include a listing of significant items that are not complete in accordance with the Contract and shall indicate the schedule date for the completion of these items. Upon receipt of written certification that Project is substantially complete; the Engineer will proceed with inspection within 10 working days of receipt of request or will advise the Contractor of items that prevent the Project from being designated as substantially complete.

2. If, following final inspection, the work is determined to be substantially complete, Engineer will prepare a list of field and paperwork deficiencies (punchlist) to be corrected before final acceptance and issue a Letter of Substantial Completion. Contractor shall complete the work described on the list of deficiencies within 30 calendar days. If the Contractor fails to complete the work within this time frame, the Engineer may either replace or correct the work with an appropriate reduction in the Contract price or charge for re-inspection costs in accordance with the Inspection of Construction clause of the contract.

3. If, following final inspection, the work is not determined to be substantially complete, Engineer will notify Contractor in writing. After completing work, Contractor shall resubmit certification and request a new final inspection. All re-inspection costs shall be paid for by the Contractor.

C. Acceptance of Work

1. When the Contractor has completed all the items on the final punchlist and made all of the required final submittals (listed below), the Contractor shall notify the Engineer that the project is complete. When the Engineer finds the work acceptable and fully complete in accordance with the Contract Documents and the punchlist, the Engineer will recommend that the District issue a Notice of Completion, accept the Contractor's work, and authorize the release of the contract retention.

2. Final submittals may include:

   a. Operation and Maintenance Manuals and Parts Lists

   b. Record Drawings

   c. Extra Materials as specified in the Contract Documents

   d. Any other submittals required by the Contract Documents and not previously received

3. The District will record the Notice of Completion at the County Recorder's Office, and shall release the contract retention to the Contractor 35 days after recording the Notice of Completion, provided no liens have been filed against the project.

D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.4 FINAL CLEANING

A. Before final inspection of the work, the Contractor shall clean the project area and all other areas occupied by them in connection with the work of all debris, excess materials, and equipment. All traveled ways (including sidewalks) shall be thoroughly swept clean of all dirt, dust, and other debris. All parts of the work shall be left in a neat and presentable condition.

B. Remove waste and surplus materials, rubbish, and construction facilities from site.

C. Dispose of concrete and other debris off site.

D. Move all clean surplus soils to stockpile area.

1.5 STARTING AND TESTING OF SYSTEMS

A. Coordinate schedule for start-up and testing of systems.

B. Notify Engineer five working days prior to start-up and testing.

C. Submit a written report in accordance with Section 01 33 00 - Submittal Procedures that facilities have been properly installed, tested and area functioning correctly.

1.6 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate facilities to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate any start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of facilities as applicable.

1.7 TESTING, ADJUSTING AND BALANCING

A. Provide additional testing, adjusting, and balancing if required. Reports will be submitted by independent firm to Engineer indicating observations and results of tests and indicating compliance or non-compliance with requirements of Contract Documents.

1.8 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Prohibit traffic from landscaped areas.

1.9 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and other modifications to the Contract.

5. Reviewed Shop Drawings, Product Data, and Samples.

6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly. Make record drawings available to the Engineer for inspection at the time of monthly progress payment requests. If project record drawings are not current, the Engineer may retain an appropriate amount of the progress payment.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.

2. Product substitutions or alternates utilized.

3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finish floor datum.

2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.

4. Field changes of dimension and detail.

5. Details not on original Contract drawings.

G. Submit documents to Engineer with claim for final Application for Payment.

1.10 OPERATION, MAINTENANCE, AND MANUFACTURER’S DATA

A. Submit data bound in 8-1/2 x 11 inch text pages, three D side ring binders with durable plastic covers.

B. Prepare binder cover with printed title "OPERATION, MAINTENANCE, AND MANUFACTURER’S DATA", title of project, and subject matter of binder when multiple binders are required.

C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

E. Contents: Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.

2. Part 2: Operation and maintenance instructions arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following as applicable:

    a. Significant design criteria.

    b. List of equipment.

    c. Parts list for each component.

    d. Operating instructions.

    e. Maintenance instructions for equipment and systems.

    f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

3. Part 3: Project documents and certificates, including the following:

    a. Shop drawings and product data.

    b. Air and water balance reports.

    c. Certificates.

    d. Originals of warranties and bonds.

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.

B. Deliver to Project Site and place in location as directed by Owner; obtain receipt prior to final payment.

1.12 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten working days after completion of applicable item of work.

B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include Table of Contents and assemble in three D side ring binder with durable plastic cover.

F. Submit prior to final Application for Payment.

G. Time Of Submittals:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten working days after acceptance.

2. Make other submittals within ten working days after Date of Substantial Completion, prior to final Application for Payment.

3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten working days after acceptance, listing date of acceptance as beginning of warranty or bond period.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 74 00

SITE AND AREA CLEANUP

PART 1 GENERAL

1.1 DESCRIPTION

A. Maintain work areas free from accumulations of waste, debris, dust and mud caused by Contractor's operations.

B. At completion of Work, remove all waste materials, tools, equipment, machinery, surplus materials, leave property clean; leave all rights-of-way in a condition equal to pre-project conditions.

C. Related Sections

1. Section 01 50 00 – Temporary Facilities and Controls

2. Section 01 57 19 – Environmental Requirements

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for this item shall be included in the Mobilization/Demobilization Bid Item. No additional measurement or payment will be included for the requirements of this section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PROTECTION

A. The Contractor shall contact Northern California Underground Service Alert (USA) 811 prior to any excavation.

B. The Contractor shall be solely responsible for the protection of adjacent properties, structures, streets, and utilities. Any damaged items shall be repaired to original condition or better, as determined by the Engineer, at the Contractor's expense.

C. The Contractor shall protect benchmarks, survey control points, and existing structures not identified for removal from damage or displacement.

3.2 CLEARED MATERIAL

A. Clearing and grubbing shall consist of removal of all objectionable material within the limits of work shown on the Plans and as directed by the Engineer. Objectionable materials shall include but are not limited to all abandoned or removed pipes or other appurtenances, conduits, waste concrete, trash, unused construction materials, unused sand or aggregate, extra asphalt paving, packing materials, silt fences and other erosion control materials as approved by Engineer and other objectionable material identified by the Engineer. All

objectionable cleared material shall become the property of the Contractor and shall be removed from the project site and disposed of or recycled properly.

3.3 REMOVAL

A. Remove objectionable materials, trash, debris, rock, and extracted plant life from site.

B. Remove paving only if absolutely necessary for performance of the work. Neatly saw cut edges at right angle to surface. Dispose of at approved disposal or recycling facility.

C. Do not burn or bury materials on site. Leave site in clean condition.

3.4 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, re-landscaped, or re-graded without mixing with foreign materials for use in finish grading.

B. Stockpile and protect from erosion. Stockpile material on impervious material and cover over the same material until reuse.

C. Remove excess topsoil not intended for reuse from site.

3.5 DURING CONSTRUCTION

A. Execute cleaning to ensure that any private property, grounds and especially access roads and public properties are maintained free from accumulation of waste materials, dust, mud and debris.

B. The Contractor shall keep all access roads clean and free of dust, mud and debris resulting from Contractor's operations.

C. All waste materials, debris and rubbish shall be disposed of at sites to be chosen by Contractor. Prior to dumping soils on any private property, a letter allowing such dumping shall be obtained from the property Owner and presented to the Engineer and the Humboldt County Department of Environmental Health for approval.

Senior REHS, Solid Waste Program
DHHS, Department of Environmental Health
100 H Street, Suite 100
Eureka, CA 95501

D. If, in the opinion of the Engineer, the Contractor has not sufficiently cleaned the project area, the Engineer shall issue a written notice to the Contractor stating that the Contractor shall clean the project area to the satisfaction of the Engineer within forty-eight (48) hours. If the Contractor does not properly clean up (in the opinion of the Engineer or the Owner), then either the Engineer or the Owner shall have the option of using outside equipment to perform the Work and such cost will be withheld from the Contract.

3.6 AFTER CONSTRUCTION

A. If, in the opinion of the Engineer, the Contractor has not sufficiently cleaned the project area, the Engineer shall issue a written notice to the Contractor stating that the Contractor shall clean the project area to the satisfaction of the Engineer within forty-eight (48) hours. If the Contractor does not properly clean up (in the opinion of the Engineer or the Owner), then either the Engineer or the Owner shall have the option of using outside equipment to perform the Work and such cost will be withheld from the Contract. Site shall be left in a condition equal to or better than existed prior to construction.

END OF SECTION

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SECTION 02 00 10

SITE CONDITIONS

PART 1 - GENERAL

1.1 RELATED INFORMATION

A. Related information and requirements are included in the General Conditions and the individual Sections of these Specifications.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for this item shall be included in the Bid Item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 INFORMATION ON SITE CONDITIONS

A. All information obtained by the Owner regarding site conditions, surface topography, subsurface information, groundwater elevations, existing construction of site facilities, existing underground utilities, and similar data will be available to prospective Bidders upon request and at the office of the Engineer prior to bid opening.

B. Investigations conducted by a Geotechnical Engineer of subsurface conditions were made for the purpose of study and design, and neither the Engineer nor the Owner assume any responsibility in respect to the sufficiency or accuracy of the test pits, or of other investigations that have been made, or of the interpretations made thereof, and there is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations are representative of those existing throughout such area, or any part thereof, or that unforeseen for developments may not occur. The Geotechnical Report has been included as an Appendix to these Specifications.

C. Any logs of test borings, pits, geotechnical reports, or topographic maps showing a record of the data obtained by the investigations of surface and subsurface conditions that are made available, shown on the Drawings, or bound herewith shall not be considered a part of the Contract Documents, said logs representing only the opinion of the Geotechnical Engineer as to the character of the materials encountered in their investigations and are provided only for the convenience of the Bidders.

D. Information derived from inspection of logs of test borings, pits, topographic maps, geotechnical reports, or from Drawings showing locations of utilities and structures will not in any way relieve the Contractor from any risk, or from properly examining the site and making such additional investigations as the Contractor may elect, or from properly fulfilling all the terms of the Contract Documents.

1.4 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor shall satisfy themselves as to the nature and location of the Work and the general and local conditions, particularly those bearing upon trenching, excavation, and grading methods, availability of transportation, disposal, limited access to site, handling and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment facilities needed prior to and during the

prosecution of the Work, and all other matters which can in any way affect the Work or the cost thereof under this Contract.

B. The Contractor shall further satisfy themselves as to the character, quality, and quantity of surface and subsurface materials to be encountered during the course of execution of the work by inspecting the site, as well as any exploratory work performed by the Engineer, and information presented in the Drawings and Specifications made a part of this Contract. Any failure by the Contractor to become acquainted with all available information will not relieve the Contractor from responsibility for properly estimating the difficulty or cost of successfully performing the Work.

C. The Contractor shall anticipate underground obstructions such as utility lines, concrete, water table, soil conditions, and debris. No extra payment will be allowed for the removal, replacement, repair or possible increased cost caused by underground obstructions. Any such lines or obstructions indicated on the map show only the approximate location and must be verified in the field by the Contractor. The Engineer will endeavor to familiarize the Contractor with all known underground obstructions, but this will not relieve the Contractor from full responsibility in anticipating and locating all underground obstructions.

D. The Contractor shall note that some of the roadways experience minimal traffic flow, and heavy truck and equipment operations may cause roadway damage in excess of normal usage. Damage caused to roadways by the Contractor's operations shall be repaired to a condition equal or better than the original condition at the Contractor's expense.

E. Contractor shall submit a Site Security Plan, which shall include staging areas, fencing, and description of how to secure the project materials from damages and unauthorized access.

1.5 ADDITIONAL INFORMATION

A. Prior to bidding, Bidders may make their own subsurface investigations subject to time schedules and arrangements approved in advance by the Owner. Before any subsurface test holes are excavated, Bidder must submit insurance documents and receive written approval from the Owner.

1.6 SURFACE FACILITIES

A. The Contractor is advised that the Plans were prepared based on available information; therefore, all existing surface facilities may not be shown on the Drawings. It is the Contractor's responsibility to become acquainted with existing site conditions per this Section and anticipate those surface facilities which are typically encountered (fences, signs, mailboxes, sidewalks, driveways, ditches, AC pavement, AC dikes, curbing, power poles, overhead lines, landscaping, irrigation, etc.) and will affect the work. The Contractor shall provide adequate security to protect the public and Work. No extra payment will be made to the Contractor for the repair, removal and replacement of such facilities. Full payment for this work shall be as included in the various bid items.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 02 00 30

EXISTING UTILITIES AND UNDERGROUND STRUCTURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Refer to plans for the locations of utilities and underground structures.

B. Contractor's responsibilities.

1.2 CALIFORNIA ADMINISTRATIVE CODE

A. Section 1540(a)1 of Construction Safety Orders (Title 8) California Administrative Code, section 1540 states:

"(1) Prior to opening and excavation, effort shall be made to determine whether underground installations; i.e. sewer, water, gas, electric lines, storm drain, cable TV, telephone, and fiber optics, will be encountered and, if so, where such underground installations are located. When the excavation approaches the approximate location of such an installation, the exact location shall be determined by careful probing or hand digging; and, when it is uncovered, adequate protection shall be provided for the existing installation. All known owners of underground facilities in the area concerned shall be advised of proposed work at least 48 hours prior to the start of actual excavation."

B. The Engineer has estimated the approximate location of public utilities and underground structures based on information provided by Points West Surveying Company. However, in accordance with California's Administrative Code, section 1540, Contractor shall make the effort to determine the exact location of underground installations.

1.3 PUBLIC UTILITIES AFFECTED

A. Electrical: Pacific Gas & Electric Company. It should be noted that where service to a structure, known to receive service, does not have overhead service, then underground services shall be assumed to exist. For underground utility location call Underground Service Alert (USA) at (800) 227 – 2600 a minimum of 72 hours prior to any excavation and pothole for exact location.

B. Natural Gas: Pacific Gas & Electric Company has jurisdiction over natural gas lines. For underground utility location call USA at (800) 227 – 2600 a minimum of 72 hours prior to any excavation and pothole for exact location.

C. Water Service: McKinleyville Community Services District has jurisdiction over all other water mains and services within the specific limits of the project.

D. Drainage: Humboldt County has jurisdiction over drainage within the corporate limits of McKinleyville, including jurisdiction for the creeks within that area.

E. Roads: Humboldt County has jurisdiction over roads in the area. Contractor shall obtain an encroachment permit from the County for all work within their properties.

F. Cable Television: Suddenlink - It should be noted that where overhead service to a structure that has service does not exist then underground service shall be assumed to exist. For

underground utility location call USA at (800) 227-2600 a minimum of 72 hours prior to any excavation and pothole for exact location.

G. Telephone: AT&T - It should be noted that where overhead service to a structure, known to receive service, does not have overhead service, then underground service shall be assumed to exist. For underground utility location call USA at (800) 227 – 2600 a minimum of 72 hours prior to any excavation and pothole for exact location.

H. Sanitary Sewer: McKinleyville Community Services District has jurisdiction over the sewer mains and services within the limits of the project.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 CONTRACTOR RESPONSIBILITY

A. The Contractor shall anticipate water, sewer, storm drain, electrical, gas, cable TV, telephone, and other common services in the project area. It may be expected that there will be variation in location from that as shown on the Plans to the actual location. Actual location can best be determined in the field after pre-marking by the various utilities affected.

B. It should be understood that the various utilities are indicated on the Plans to show only the approximate location and must be verified in the field by the Contractor. The various utility agencies will cooperate to endeavor to familiarize with the Contractor with all known underground utility obstructions, but this will not relieve the Contractor from full responsibility in anticipating and locating their actual existence. No extra payment will be allowed for the removal, replacement, repair, or possible increased cost caused by inadvertent or planned interception and breaking of underground obstructions which may exist.

C. The Contractor, in conjunction with the affected utility company(s), shall locate and establish the horizontal and vertical location of all utilities shown on the Plans and marked in the field. This may be done on an area by area basis, but shall be accomplished at least five (5) working days in advance of the date of construction within such area and prior to any fabrication. Any discrepancies (horizontal and/or vertical) between the location of a utility found by the potholing operation than that shown on the Plans shall be brought to the Engineer's attention immediately. The Engineer shall determine if field revisions are necessary, and if so, make the revision. In the event utility(s) relocation is determined necessary, the utility company involved will be responsible for relocation or the general contractor will perform the relocation as extra work.

END OF SECTION

SECTION 31 05 13

SOILS FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Subsoil materials.

2. Topsoil materials.

B. Related Sections:

1. Section 31 23 33 – Trenching and Backfilling.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for soils for earthwork shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Submit test data for controlled fill and select fill.

1.5 QUALITY ASSURANCE

A. Furnish each subsoil and topsoil material from single source throughout the Work.

B. Perform Work in accordance with Caltrans Standard Plans.

PART 2 PRODUCTS

2.1 SUBSOIL MATERIALS

A. Select Fill:

1. On-site excavated and re-used material or Imported graded limestone or coral sand and gravel.
2. Free of lumps and rocks larger than 4 inches, and debris.
3. A maximum of 25% fines passing the No. 200 mesh sieve.
4. Conforming to ASTM D2487 Group Symbol GM or GC.
5. Contractor may use crushed concrete passing a 1” screen.

2.2 TOPSOIL MATERIALS

A. Topsoil:

1. Topsoil material scraped from excavation areas and passing a 1” screen with characteristics similar to other materials listed in this section.
2. Sandy loam.
3. Reasonably free of roots, rocks larger than 1 inch, subsoil, debris, large weeds, and foreign matter.
4. Acidity range (pH) of 5.5 to 7.5.
5. Containing minimum of 4 percent and maximum of 25 percent inorganic matter.

2.3 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements

B. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698. ASTM C136.

C. When tests indicate materials do not meet specified requirements, change material and retest.

D. Furnish materials of each type from same source throughout the Work.

E. Testing frequency shall be one test for every 500 cubic yards of each type of imported soil.

PART 3 EXECUTION

3.1 EXCAVATION

A. Excavate subsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas.

B. Stockpile excavated material meeting requirements for subsoil materials.

C. Remove excess excavated materials not intended for reuse, from site.

D. Remove excavated materials not meeting requirements for subsoil materials from site.

3.2 STOCKPILING

A. Stockpile materials on site per best management practices.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

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SECTION 31 05 16

AGGREGATES FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Coarse aggregate materials.
2. Fine aggregate materials.
3. Aggregate drain rock.

B. Related Sections:

1. Section 31 05 13 – Soils for Earthwork.
2. Section 31 23 33 – Trenching and Backfilling.
3. Section 33 14 00 – Water Piping Systems.
4. Section 33 31 00 – Sanitary Utility Sewerage Piping.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for aggregates for earthwork shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
2. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.
3. AASHTO T210 – Standard Method of Test for Aggregate Durability Index.

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3).

4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

5. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Submit name of imported fill material suppliers and Test Data.

1.5 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with Caltrans Standard Plans.

PART 2 PRODUCTS

2.1 COARSE AGGREGATE MATERIALS

A. Class 2 Aggregate Base 3/4-inch maximum per Caltrans Standard Specifications 26-1.02B.

B. Aggregate Drain Rock: Natural stone; washed, free of clay, shale, organic matter, and other deleterious material to the following limits:

1. Minimum Size: 1/4 inch.

2. Maximum Size: 1 1/2 inch.

C. Pea Gravel: Natural stone; washed, free of clay, shale, organic matter, and other deleterious material to the following limits:

Sieve Size	Percent Passing
1/2 inch	100
3/8 inch	85-100
No. 4	10-30
No. 8	0-10
No. 16	0-5
No. 200	<1.0

2.2 FINE AGGREGATE MATERIALS

A. Fine Aggregate (Sand): Natural or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter; graded in accordance within the following limits:

Sieve Size	Percent Passing
3/8 inch	100
No. 4	50
No. 14	6
No. 50	2

No. 200	1

2.3 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements

B. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698. ASTM D4318. ASTM C136.

C. Fine Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698. ASTM D4318. ASTM C136.

D. When tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 EXCAVATION

A. Excavate aggregate materials from on-site locations indicated.

B. Stockpile excavated material meeting requirements for coarse aggregate materials.

C. Remove excess excavated materials not intended for reuse from site.

D. Remove excavated materials not meeting requirements for coarse aggregate materials from site.

3.2 STOCKPILING

A. Stockpile materials on site at locations designated by Engineer.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.

D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

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SECTION 33 10 00

SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removing surface debris.
2. Removing vegetation.
3. Removing abandoned utilities.
4. Excavating topsoil.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for site clearing shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data for herbicide. Indicate compliance with applicable codes for environmental protection.

C. For all herbicide use:

1. Contractor Qualifications: Minimum of three years' experience in performing the types of services specified herein.
2. Contractor personnel providing on-site pest control service must maintain certification as
3. Commercial Pesticide Applicators in the category of Industrial, Institutional, Structural, and Health Related Pest Control. Uncertified individuals working under the supervision of a Certified Applicator will not be permitted to provide service under this contract.
4. Current and valid 'Operator Identification Number' issued by the Humboldt County Agricultural Commissioner.
5. Current and valid Qualified Applicator License (QAL) with an Aquatic Pest Control category issued by the California Department of Pesticide Regulation.
6. A written recommendation per sub-Section Quality Control.
7. Proposed materials and equipment.

8. Material Safety Data Sheet (MSDS) for herbicides proposed for use.

9. Manufacturer's container label showing active ingredient, percent active ingredient, recommended application rate and procedure for target species, Environmental Protection Agency registration number, and precautionary statements.

1.4 QUALITY ASSURANCE

A. Conform to applicable Humboldt County Department of Environmental health regulations for environmental requirements, disposal of debris, and use of herbicides.

B. Perform Work in accordance with Caltrans Standard Plans.

C. Application of herbicide:

1. For all herbicide use a written recommendation from a licensed qualified applicator shall be obtained for each herbicide to be used prior to its application.

2. Herbicides shall only be applied to Scotch broom (Cytisus scoparius) using the cut stem application. No other species shall be targeted for control using herbicides. No other methods shall be employed when using herbicides.

3. Herbicides shall only be applied by a qualified applicator licensed to apply commercial herbicides.

4. Contractor shall be responsible for application of pesticides according to the label.

5. Regulatory compliance: All Herbicides used by the Contractor must be registered with the U.S. Environmental Protection Agency (EPA) and applicable jurisdictions.

6. Transport, handling, and use of all pesticides shall be in strict accordance with the manufacturer's label instructions and all applicable laws and regulations.

7. Prohibited Herbicides: Contractor shall not apply any pesticide product that has not been approved in writing by the Owner.

8. Notification: Contractor shall notify Owner at least 48 hours in advance of the application of any pesticide.

9. Care in draining and flushing tanks shall be exercised. Draining and flushing of herbicide tanks onto bare soil within the project site shall not be permitted.

10. Contractor shall dispose of herbicides safely at an appropriate offsite facility. Contractor shall not dump herbicides on the ground.

11. The Contractor shall keep careful written record of what type of herbicide is applied, where it was applied, to what species, treatment method, application dates, and concentrations.

12. These records shall be made available to the Owner or Owner Representative upon request, and shall be used as a basis for evaluation compliance with these specifications.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify existing plant life designated to remain is tagged or identified.

C. Identify salvage area for placing removed materials.

3.2 PREPARATION

A. Notify affected utility companies not less than three working days before performing Work.

B. Request underground utilities to be located and marked within and surrounding construction areas.

3.3 PROTECTION

A. Locate, identify, and protect utilities indicated to remain, from damage.

B. Protect trees, plant growth, and features designated to remain, as final landscaping.

C. Protect survey control points from damage or displacement.

3.4 CLEARING

A. Clear areas required for access to site and execution of Work to minimum depth of 12 inches.

B. Remove trees and shrubs indicated. Remove stumps, root system to depth of 12 inches and surface rock.

C. Apply herbicide to remaining stumps to inhibit growth.

3.5 REMOVAL

A. Remove debris, rock, and extracted plant life from site.

B. Remove paving and concrete shown for demolition.

C. Remove abandoned utilities. Indicated removal termination point for underground utilities on Record Documents.

D. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.

E. Do not burn or bury materials on site. Leave site in clean condition.

3.6 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, re-landscaped, or regraded, without mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion. Stockpile material on impervious material, until disposal.

D. Remove unused topsoil from site.

END OF SECTION

SECTION 31 23 16

EXCAVATION

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. All excavation other than trenching.

B. Related Sections:

1. Section 31 05 13 – Soils for Earthwork
2. Section 31 05 16 – Aggregates for Earthwork.
3. Section 31 23 33 – Trenching and Backfilling.
4. Section 33 14 00 – Water Piping Systems.
5. Section 33 31 10 – Sanitary Utility Sewerage Piping.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for this item shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 REFERENCES

A. Local utility standards when working within 24 inches of utility lines.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with Caltrans Standard Plans.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PREPARATION

A. Notify affected utility companies and Owner not less than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas. Conduct additional utility locating including ground penetrating radar, potholing and other means.

B. Identify required lines, levels, contours, and datum locations.

C. Protect plant life, and other features remaining as portion of final landscaping.

D. Protect benchmarks, survey control points and existing structures from excavating equipment and vehicular traffic.

E. Maintain and protect above and below grade utilities indicated to remain.

3.2 EXCAVATION

A. Excavate subsoil to accommodate utilities, structures, channels, swales, and other improvements.

B. Compact backfills in accordance with Section 31 23 33.

C. Slope banks with machine to angle of repose or less until shored.

D. Do not interfere with 45 degree bearing splay of foundations.

E. Grade top perimeter of excavation to prevent surface water from draining into excavation.

F. Trim excavation. Remove loose matter.

G. Remove lumped subsoil, boulders, and rock.

H. Notify Engineer of unexpected subsurface conditions.

I. Correct areas over excavated with structural fill Type.

J. Remove excess and unsuitable material from site.

K. Stockpile excavated material in area designated on site in accordance with Section 31 05 13.

L. Repair or replace items indicated to remain damaged by excavation.

3.3 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.4 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

SECTION 31 23 19

DEWATERING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Design, construction, operation and maintenance of effective dewatering operations.
2. Dewatering pumping control.
3. Disposal of extracted groundwater.
4. Removal and relocation of equipment and clean-up of sites.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for dewatering shall be included in Dewatering System/Water Control Bid Item. No additional measurement or payment will be included for the requirements of this section.

1.3 RELATED SECTIONS

A. Related work specified in other sections:

1. Section 01 57 19 – Environmental Requirements
2. Section 31 23 16 – Excavation
3. Section 31 23 20 – Shoring and Trench Safety
4. Section 31 23 33 – Trenching and Backfilling

1.4 QUALITY ASSURANCE

A. Qualifications. Furnish the services of an experienced, qualified, and equipped Dewatering Subcontractor to design and operate the dewatering required for the Work. In lieu of the above, the General Contractor may do the dewatering in accordance with a system approved by the Engineer.

B. Data Available for Examination. The Geotechnical Report for this project has been included as an Appendix to these Specifications. This data is made available for information only, and conditions during construction could be different than conditions observed during the geotechnical investigation.

C. Monitoring. The Contractor shall qualitatively monitor for odor or visual discrepancies indicative of hydrocarbon contamination in groundwater during dewatering operations. The Contractor shall notify the Engineer immediately if potential contamination is encountered.

1.5 SUBMITTALS

A. Dewatering Plan: Submit for record purposes only and not for review or approval, shop drawings and data showing the intended plan for dewatering operations. Dewatering systems shall be designed and maintained by the Contractor and shall be coordinated with the design of shoring specified in Section 31 23 30. The plan should contain at a minimum the sizes of pumps, tanks, filtration devices, and the points of disposal. The plan should also include alternate (contingent) systems, and the Contractor should be prepared to alter the initial dewatering or shoring systems to meet the specified requirements. Submit the referenced intended plan not less than 15 days prior to start of dewatering operations.

B. Product Data: Submit data for each of the following:

1. Dewatering Pumps: Indicate sizes, capacities, priming methods, and engine or motor characteristics.

2. Pumping equipment for control of discharge.

3. Size of tank(s) used for storage.

4. Specifications and size and type of filters and any other materials used for filtration.

5. Traffic Control Plan: Provide traffic control plans around tanks, hoses and other dewatering equipment. Refer to Section 01 55 26 – Temporary Traffic Control Systems

PART 2 PRODUCTS

2.1 COMPONENTS OF THE DEWATERING SYSTEM

A. Provide units of standard manufacture and in good working order. Remove from the job site unserviceable parts and equipment. Major equipment for which repair parts are unavailable from local suppliers shall be considered obsolete and not acceptable.

PART 3 EXECUTION

3.1 PREPARATION

A. Coordination. Lay out and install dewatering installations beyond the limits of the permanent works. Avoid interference with access or other necessary activities.

B. Barricades, Shelters, and Safety. Provide protection for vital parts of the employed dewatering system from accidental damage, and erect signs and barricades to isolate hazardous areas.

3.2 PERFORMANCE

A. Dewatering. Perform dewatering operations as required so all underground and below grade Work is performed or installed in dry excavations. Maintain dewatering systems in continuous operation until the involved work is completed, including the placing and compaction of backfill materials in the dry. For horizontal directional drilling applications, excavated areas shall be dewatered to at least two feet below the excavated depth of the sump.

B. Protection of Existing Facilities. Provide standby equipment of sufficient size and capacity to ensure continuous operation of the dewatering systems. Where any sloped excavation infringes on or potentially endangers any existing facilities or structures, provide shoring, sheeting, and bracing according to shop drawings and calculations signed and stamped by a Structural or Civil Engineer registered in the State of California. File a copy of such plans and calculations with the Owner for record purposes. Repair and make good all damage or settlement to the foundation or other portion of any new or any existing facilities or structures caused by permanent or temporary failure, operation of the dewatering systems, or by failure to maintain the existing groundwater level outside the dewatered areas. Such repair work shall be performed at no additional expense to the Owner.

C. Drainage. Contractor shall provide and maintain ample means to promptly and effectively remove water from all areas of work, to prevent the entry of harmful quantities of water into the excavations and to dispose of the water removed. Avoid environmental damage and nuisance.

D. Disposal of Extracted Ground Water. Dispose of groundwater extracted by the dewatering system employed at the construction site as described as follows:
   a. Reuse the water on-site for dust control, compaction, or irrigation, as appropriate.
   b. Retain the water on-site in a grassy or porous area to allow infiltration/evaporation.
   c. Discharge (by permit to be obtained by Contractor) to a sanitary sewer or storm drain (this option may require a temporary method to filter sediment-laden water prior to discharge). If discharge to a storm drain (i.e., surface waters) is the only feasible option, the Project will comply with Water Board requirements for construction dewatering. Measures may include characterizing the discharge and receiving waters and developing a Best Management Practices Plan including filtering methods and monitoring and reporting requirements.

E. Removal. Remove equipment when no longer required for dewatering or water controlling operations. Maintain operation of monitoring systems until their removal is approved. Remove all temporary works and dewatering facilities in a manner satisfactory to the Owner and the permits for the Project.

3.3 DEWATERING PUMPING CONTROL

A. For dewatering pumping outside normal working hours, engines shall be equipped and/or shielded in a manner to keep noise to a minimum. Testing is required to show compliance with local ordinances. The Contractor shall conduct all work to minimize the impact of construction noise on nearby business and residential neighborhoods.

B. To minimize noise levels, the Contractor shall attempt to obtain electrical power from PG&E in lieu of providing power by portable generator. If use of utility power is not practicable, generator power may be provided by sound-attenuated electrical generators.

C. Diesel generators shall not be utilized unless they are provided with sound barriers or enclosures, as necessary, to comply with local ordinances.

D. Open pumping from sumps shall not result in boils, softening of the ground, or loss of fines. Sumps, subdrains, drain blankets, wells and well points shall be installed with suitable filters or screens so that fines are not removed from the formation.

E. Provide a generator and all equipment necessary to provide a backup electrical power source in the event of a power service interruption.

F. Maintain temporary drainage facilities of adequate size, with standby pumps and adequate back-up power for emergency use, to collect and dispose of water which enters the pipeline trench or structure excavation.

3.4 CLEANUP

A. Upon completion of the work in this Section, remove rubbish and debris and leave the entire area affected by the work in a neat, clean and acceptable condition.

END OF SECTION

SECTION 31 23 30

SHORING AND TRENCH SAFETY

PART 1 – GENERAL

1.1 SUMMARY

A. Principle items specified herein are:

1. Shoring required for general safety, worker protection and protection of adjacent property from the hazards of caving ground.

2. Trench excavations

3. Structural excavations

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for shoring and trench safety shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 RELATED SECTIONS

A. Related work specified in other sections:

1. Section 31 23 19 – Dewatering.

2. Section 31 23 16 – Excavation.

3. Section 31 23 33 – Trenching and Backfilling.

1.4 REFERENCED CODES AND SPECIFICATIONS

A. The following standards apply:

1. Cal/OSHA, State of California Administrative Code, Title 8; Industrial Relations, Chapter 4, Subchapter 4, Construction Safety Orders.

2. Occupational Safety and Health Administration (OSHA) Regulations, 29 CPR Part 1926 Subpart P - Excavations.

1.5 CONTRACTOR'S RESPONSIBILITIES FOR SAFETY

A. The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons (including employees) and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours.

B. The duty of the Engineer to conduct construction review of the Contractor's performance is not intended to include a review or approval of the adequacy of the Contractor's safety supervisor, the safety program, or any safety measures taken in, on, or near the construction site.

C. The Engineer will review the submittal of the Contractor's proposed shoring system to verify the general scope of the Work, to determine that qualified professional engineering services are used and to determine that appropriate construction techniques are proposed for use. This review shall not in any way be construed to relieve the Contractor from sole responsibility for the design and safety of such shoring.

D. The Contractor shall appoint a supervisory employee who shall be responsible for determining which of the engineered shoring systems (if alternates are provided) shall be used depending on local soil type, water table, etc.

1.6 PERMIT

A. For trenches or excavations five (5) - feet or more in depth, obtain from the State Division of Industrial Safety a permit for such excavation; submit a copy of the permit to the Engineer, prior to initiating any Work requiring said permit.

1.7 SAFETY ORDERS

A. The Contractor shall have at the Work site, copies or suitable extracts of the Construction Safety Orders of Cal-OSHA.

B. All Work shall comply with the provisions of these and all other applicable laws, ordinances and regulations.

1.8 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 – “Submittal Procedures”:

1. Trench Safety Plan:

a. For trenches or excavations five feet or more in depth, the Contractor shall submit to the Engineer a detailed plan design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazards of caving ground. The design shall be coordinated with the dewatering plan (Section 31 23 19). Such plans shall be submitted at least 10 working days before the Contractor intends to begin trenching or excavation work. Submittal shall be for trench work and work at vaults, and other cuts 5 feet or more in depth. NOTE: Water table and moisture content will vary with rainfall and cause varying soil strength.

b. Groundwater may be present in trench backfill of existing utilities. Contractor shall design shoring and dewatering systems to mitigate against washout of materials from existing utility trenches. Reconstruction of the structural section of the road, if required, will be completed at the Contractor’s expense.

c. The trench safety plans shall be prepared, stamped and signed by a civil or structural engineer registered in California. Stamped and sealed copies of calculations necessary to obtain approval of the systems shall be submitted also. These plans shall be posted on the job site.

d. Nothing herein shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders of the Division of Industrial Safety.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 REMOVAL OF SHORING

A. Removal of shoring shall not damage pipes or structures, cause settlement or heave the ground surface, or produce vibrations that could damage adjacent pipe or structures.

B. Minimum compaction requirements must be met after shoring is removed.

PART 4 TESTING (NOT USED)

END OF SECTION

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SECTION 31 23 33

TRENCHING AND BACKFILLING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Compacted fill from top of utility bedding to subgrade elevations.
2. Backfilling and compaction.
3. Backfilling site structures to subgrade elevations.
4. Fill under paving.
5. Fill for over-excavation.

B. Related Sections:

1. Section 31 05 13 - Soils for Earthwork: Subsoil materials.
2. Section 31 05 16 - Aggregates for Earthwork: Aggregates for fill.
3. Section 31 23 16 - Excavation.
4. Section 33 14 00 – Water Piping Systems.
5. Section 33 31 00 - Sanitary Utility Sewerage Piping.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for trenching and backfilling shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.

B. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).
2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3).

4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

5. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.4 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit or cable.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with Caltrans Standard Plans

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.8 COORDINATION

A. Section 01 30 00 – Administrative Requirements: Coordination and project conditions.

B. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Subsoil Fill: Select Fill as specified in Section 31 05 13.

B. Structural Fill: Coarse Aggregate Base as specified in Section 31 05 16.

C. Granular Fill: Coarse Aggregate Subbase as specified in Section 31 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify subdrainage, damp-proofing, or waterproofing installation has been inspected.

C. Verify structural ability of unsupported walls to support loads imposed by fill.

3.2 LINES AND GRADES

A. Lay pipes to lines and grades indicated on Drawings.

1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.

B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.3 PREPARATION

A. Trenching:

1. Notify affected utility companies not less than three working days before performing Work.

a. Request underground utilities to be located and marked within and surrounding construction areas. Conduct additional utility locating including ground penetrating radar, potholing and other means.

2. Identify required lines, levels, contours, and datum locations.

3. Protect plant life, lawns, and other features remaining as portion of final landscaping.

4. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

5. Maintain and protect above and below grade utilities indicated to remain.

6. Establish temporary traffic control when trenching is performed in public right-of-way. Relocate controls as required during progress of Work.

B. Backfill:

1. Compact subgrade to density requirements for subsequent backfill materials.

2. Cut out soft areas of subgrade not capable of compaction in place. Backfill with select fill and compact to density equal to or greater than requirements for subsequent fill material.

3. Scarify subgrade surface to depth of 6 inches.

4. Proof roll / compact to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.4 TRENCHING

A. Excavate subsoil required for utilities to utility service.

B. Remove lumped subsoil, boulders, and rock.

C. Perform excavation within 24 inches of existing utility service in accordance with utility’s requirements.

D. Do not advance open trench more than 200 feet ahead of installed pipe. Access to all open trenches to be controlled by contractor. Open trenches shall be covered with plates when not directly monitored.

E. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.

F. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe.

G. Do not interfere with 45 degree bearing splay of foundations.

H. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth as directed by Engineer until suitable material is encountered.

I. Cut out soft areas of subgrade not capable of compaction in place. Backfill with coarse aggregate and compact to density equal to or greater than requirements for subsequent backfill material.

J. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

K. Correct areas over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Engineer.

L. Remove excess subsoil not intended for reuse from site.

M. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.

3.5 WIDTH OF TRENCH

A. Except where otherwise specifically permitted, sides of trenches shall be vertical, shored as required, and shall be of uniform width from top to bottom. Trenches shall be of a width as shown on the detail sheets in the Contract Drawings and per Humboldt County Public Works Encroachment Permit requirements. In no case shall the free working space on each side of the pipe be less than 6-inches.

B. The maximum width of trench measured at the top of the pipe shall be kept to a minimum and not exceed the outside diameter of pipe plus 12 inches.

C. If trench widths exceed those shown on the plans, install all additional stabilization material, bedding and cover, backfill, base and paving in conformance with these specifications at no additional cost to the District.

3.6 SHEETING AND SHORING

A. Contractor’s attention is directed to General Conditions, Section B-52 – Safety.

B. Contractor’s attention is directed to Section 31 23 30 – Shoring and Trench Safety.

C. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.

D. Support trenches more than 5 feet deep. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.

E. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.

3.7 BACKFILLING

A. Backfill areas to contours and elevations with fill materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

C. Place material in continuous layers as follows:

1. Subsoil Fill: Select Fill, maximum 8 inches loose depth.

2. Structural Fill: Coarse Aggregate Base, maximum 6 inches loose depth.

3. Granular Fill: Coarse Aggregate Subbase, maximum 6 inches loose depth.

D. Employ placement method that does not disturb or damage utilities in trench.

E. Maintain optimum moisture content of backfill materials to attain required compaction density.

F. Do not leave more than 50 feet of trench open at end of working day. Any trenches left open at the end of the working day are to be covered by plates.

G. Protect open trench to prevent danger to the public.

H. Make gradual grade changes. Blend slope into level areas.

I. Remove surplus backfill materials from site.

J. Leave fill material stockpile areas free of excess fill materials.

3.8 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1/4 inch from required elevations.

C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.9 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Perform laboratory material tests in accordance with ASTM D698.

C. Perform in place compaction tests in accordance with the following:

1. Density Tests: ASTM D1557 and ASTM D6938.

2. Moisture Tests: ASTM D6938.

D. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

E. Frequency of Tests: Minimum of one test in each 1 foot of backfill, for every 100 feet of trench.

F. Proof roll compacted fill surfaces under paving.

3.10 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

B. Reshape and re-compact fills subjected to vehicular traffic.

3.11 SCHEDULE

A. Fill Under Grass and Landscaped Areas:

1. Select Fill, to 6 inches below finish grade, compact uniformly to 80 percent of maximum density.

B. Fill Under Asphalt and Concrete Paving:

1. Compact subsoil to 95 percent of its maximum dry density.

2. Coarse Aggregate Subbase Fill, to 6 inches below bottom paving elevation, compact uniformly to 95 percent of maximum density.

3. Coarse Aggregate Base Fill, to bottom paving elevation, compact uniformly to 95 percent of maximum density.

C. Fill to Correct Over-excavation:

1. Select Fill, flush to required elevation, compact uniformly to 95 percent of maximum density.

END OF SECTION

SECTION 32 11 23

AGGREGATE BASE COURSES

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aggregate subbase.
2. Aggregate base course.

B. Related Sections:

1. Section 31 23 17 - Trenching: Compacted fill under base course.
2. Section 31 23 23 - Fill: Compacted fill under base course.
3. Section 32 12 16 - Asphalt Paving: Binder and finish asphalt courses.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for aggregate base courses shall be included in the bid item to which it relates. No additional measurement and payment will be included for the requirements of this section.

1.3 REFERENCES

A. ASTM International:

1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D2940 - Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.
3. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Materials Source: Submit name of imported materials suppliers and Test Data.

1.5 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with Caltrans Standard Plans.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS

A. Coarse Aggregate Subbase: Class 2 Aggregate Base as specified in Section 31 05 16.

B. Coarse Aggregate Base: Class 2 Aggregate Base as specified in Section 31 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify compacted substrate is dry and ready to support paving and imposed loads.

1. Proof roll substrate with fully loaded 10 cu yd. dump truck in minimum two perpendicular passes to identify soft spots.

2. Remove soft substrate and replace with compacted fill as specified in Section 31 23 23.

C. Verify substrate has been inspected, gradients and elevations are correct.

3.2 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place fill on soft or muddy surfaces.

3.3 AGGREGATE PLACEMENT

A. Spread aggregate over prepared substrate to total compacted thickness of minimum 6 inches, maximum 8 inches as indicated on Drawings.

B. Roller compact aggregate to 95 percent maximum density per ASTM D6938. Maximum density shall be determined in a lab per ASTM D1557.

C. Level and contour surfaces to elevations, profiles, and gradients indicated.

D. Add small quantities of fine aggregate to coarse aggregate when required to assist compaction.

E. Maintain optimum moisture content of fill materials to attain specified compaction density.

F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation from Elevation: 1/4 inch measured with 10-foot straight edge.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Perform in place compaction tests in accordance with the following:

1. Density Tests: ASTM D1557 (lab test) and ASTM D6938 (field test)

2. Moisture Tests: ASTM D6938.

C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

D. Frequency of Tests: One test for every 1000 square feet of each layer compacted aggregate, with a minimum of one test for each discrete fill area.

3.6 COMPACTION

A. Compact materials to 95 percent of maximum density.

END OF SECTION

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SECTION 32 12 16

ASPHALT PAVING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Asphalt materials.
2. Aggregate materials.
3. Aggregate subbase.
4. Asphalt paving base course, binder course, and wearing course.
5. Surface slurry.

B. Related Sections:

1. Section 31 23 33 - Fill: Trenching and Backfilling.
2. Section 32 11 23 - Aggregate Base Courses: Compacted subbase for paving.
3. All work is to be completed in conformance with Humboldt County encroachment permit requirements.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for asphalt paving shall be included in the bid item to which it relates. No additional measurement and payment will be included for the requirements of this section.

1.3 REFERENCE STANDARDS

A. State Specification:

1. Caltrans Standard Plans.
2. Caltrans Standard Specifications.

B. American Association of State Highway and Transportation Officials:

1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
4. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.

5. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

6. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.

C. Asphalt Institute:

1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.

2. AI MS-19 - Basic Asphalt Emulsion Manual.

D. ASTM International:

1. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.

2. ASTM D977 - Standard Specification for Emulsified Asphalt.

3. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples

4. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.

5. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.

6. ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.

7. ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.

8. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.

9. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data:

1. Submit product information for asphalt and aggregate materials.

2. Submit mix design with laboratory test results supporting design.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Obtain materials from same source throughout.

B. Perform Work in accordance with Humboldt County Encroachment Permit.

C. Codes and standards:

1. Wherever a test method is referenced in this section, it shall be made in accordance with the most current test method in use by the California Department of Transportation (Caltrans) in the State Standard Specifications, latest edition.

2. All pavement testing will be performed by the Contractor.

D. Prior to beginning Work, the Contractor shall submit the company name, name of the contact person, and phone number of the Caltrans-certified lab that will be performing compaction and materials testing. Additionally, the lab shall be required to submit a copy of their Caltrans certification to the Engineer prior to the Contractor starting Work. The lab shall be required to submit copies of all test results to the Engineer within 24 hours of completing tests. Tests are to be clearly marked with the California test # (ASTM where applicable).

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing work of this section with minimum 5 years' documented experience.

1.7 ENCROACHMENT PERMIT

A. The Contractor is responsible for complying with all requirements in the Humboldt County Encroachment Permit. If there is any conflict between the requirements in this Specification and the permit, the permit shall govern. A draft permit has been included as an Appendix to these Specifications. The Contractor is responsible for obtaining and paying for the final permit from the County.

1.8 AMBIENT CONDITIONS

A. Section 01 50 00 - Temporary Facilities and Controls: Ambient conditions control facilities for product storage and installation.

B. Do not place asphalt mixture when surface is wet.

C. Place asphalt mixture when temperature is between 225 and 300 degrees F.

PART 2 PRODUCTS

2.1 PAINT BINDER (TACK COAT)

A. Per Humboldt County Encroachment Permit

2.2 HOT MIX ASPHALT

A. Asphalt concrete Type B shall be per Section 39-1.01 of the Caltrans Standard Specifications and per Humboldt County Encroachment Permit requirements.

1. Add to Section 39-1.01 of the Caltrans Standard Specifications:

a. Produce and place HMA Type A under the METHOD construction process.

B. Asphalt binder per Section 39-1.02C of the Caltrans Standard Specifications.

1. Liquid anti-stripping agent (LAS) shall be added to the asphalt binder at a rate of 0.5% by weight of asphalt binder. The LAS shall be AD-here LOF 65-00 or equivalent, and shall be stored, measured, and blended with the asphalt binder in accordance with the anti-stripping agent manufacturer's recommended practice. The LAS can be added at the asphalt plant or at the refinery. When added at the asphalt plant, the equipment shall indicate and record the amount of LAS added. If added at the refinery, the shipping ticket from the refinery shall certify the type and amount of LAS added.

2. Add to Section 39-1.02C of the Caltrans Standard Specifications:

a. Asphalt binder used in HMA Type A must be PG 64-16

C. The asphalt concrete mixture, for asphalt concrete surface and asphalt concrete base, shall conform to the following requirements:

1. Minimum tensile strength ratio (TSR) of 70, and a minimum dry tensile strength of 65 pounds per square inch, based on California Test Method 371.

2. An HMA mix shall be submitted to the Engineer two weeks prior to the commencement of paving operations.

D. Aggregate Materials:

1. Coarse Aggregate: In accordance with Section 31 05 16 Coarse Aggregate Base.

2. Fine Aggregate: In accordance with Section 31 05 16 Fine Aggregate.

E. Aggregate Subbase: Specified in Section 32 11 23.

2.3 MIXES

A. Use dry material to avoid foaming. Mix uniformly.

B. Asphalt Paving Mixtures: Designed in accordance with Caltrans Standard Specifications.

C. Surface Slurry: not used for this project.

2.4 TRAFFIC STRIPES AND MARKINGS

A. Traffic stripings or markings shall be white or yellow colored thermoplastic material. Materials shall conform to material standards for painted stripings or markings referenced in Section 84 of the Caltrans Standard Specifications.

2.5 PAVEMENT MARKERS

A. Reflective Markers

1. Reflective markers shall be Type B or Type H reflective markers as defined in Section 85 of the Caltrans Standard Specifications.

B. Non-Reflective Markers

1. Non-reflective markers shall be Type A or Type AY non-reflective markers as defined in Section 85 of the Caltrans Standard Specifications.

2.6 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Submit proposed mix design for review prior to beginning of Work.

C. Test samples in accordance with Caltrans standards.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.

C. Verify compacted subbase is dry and ready to support paving and imposed loads.

1. Proof roll subbase with fully loaded 10 yard dump truck in minimum two perpendicular passes to identify soft spots.

2. Remove soft subbase and replace with compacted fill as specified in Section 31 23 33.

D. Verify gradients and elevations of base are correct.

E. Verify gutter drainage grilles and frames, manhole frames, and cleanout and valve covers are installed in correct position and elevation.

3.2 PREPARATION

A. Prepare subbase in accordance with Humboldt County encroachment permit.

3.3 DEMOLITION

A. Saw cut and notch existing paving.

B. Clean existing paving to remove foreign material, excess joint sealant and crack filler from paving surface.

3.4 INSTALLATION

A. Subbase:

1. Aggregate Subbase: Install as specified in Section 32 11 23.

B. Primer:

1. Apply primer in accordance with Caltrans Standard Specifications.

C. Tack Coat:

1. Apply tack coat on asphalt and concrete surfaces at uniform rate in accordance with Caltrans Standard Specifications and Humboldt County encroachment permit.

2. Paint binder application shall conform to the provisions of Section 39 of the Caltrans Standard Specifications. Areas to be primed are all areas to be paved. Paint binder shall be utilized on existing asphalt and concrete surfaces.

3. Where temporary paving has been removed, the Contractor shall re-compact. A tack coat shall be applied to all existing or temporary pavement that will be in contact with the final pavement.

4. Apply paint binder at 0.10 gallons per square yard over existing paved areas.

5. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt paving. Do not tack coat these surfaces.

D. Single Course Asphalt Paving:

1. Install Work in accordance with Humboldt County encroachment permit.

2. Paving shall be conducted in accordance with the requirements listed in Section 39 of the Caltrans Standard Specifications.

3. Place asphalt within eight (8) hours of applying primer or tack coat.

4. Paving shall be done under suitable weather conditions for such operations. Temperature shall be as specified in Section 39-3.04 of the Clatrans Standard Specifications. Rain, snow or other inclement weather will be cause for discontinuing paving Work. The Engineer shall have the authority for determining whether weather conditions are sufficient cause to discontinue paving.

5. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

6. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

E. TRAFFIC STRIPES AND MARKINGS

1. Traffic stripings and markings shall be replaced at all locations where removed for completion of the Work. Application shall be in accordance with Section 84 of the Standard Specifications.

2. Painted stripping or marking material shall be applied only to dry surfaces during favorable weather. When using acetone-based paint, the air temperature shall be at least 40 degrees F. When using water-based paint, the air temperature shall be at least 50 degrees F. Glass beads shall be applied at a rate of five pounds per gallon of paint and be uniformly incorporated in all coats of paint.

3. Surfaces to receive stripping or marking material shall be cleaned of all dirt and lose material.

4. Drips, overspray, improper markings, and paint material damaged by construction traffic shall be removed and replaced at the Contractor's expense.

F. PAVEMENT MARKERS

1. Pavement markers shall be replaced in kind and number where removed for completion of the Work with new, unused material as specified herein. Application shall be in accordance with Section 85 of the Caltrans Standard Specifications.

2. Placement shall be to the alignment established by the Contractor and approved by the Engineer. Reflective face of marker should be perpendicular to roadway centerline.

3. Markers shall be cemented to the pavement with Rapid Set-Type adhesive conforming to Section 95.2.04 of the Caltrans Standard Specifications.

4. Markers shall not be placed under following conditions:

a. When either the pavement or the air temperature is 40 degrees F or less.

b. If the relative humidity of the air is greater than 80 percent.

c. If pavement is not surface dry.

d. On new asphalt concrete surfacing until the surfacing has been opened to public traffic for a period of not less than 14 days.

3.5 STREET MAINTENANCE

A. Until the permanent pavement is placed, the base rock or temporary asphaltic plant mix at the surface of the trench shall be maintained at all times at a grade level with the adjacent street. Continuous inspection and maintenance of the trench area will be required. Lights and barriers shall be maintained on all Work that is not safe for travel until such time as is made safe.

3.6 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.

C. Scheduled Compacted Thickness: Within 1/4 inch.

D. Variation from Indicated Elevation: Within 1/2 inch.

3.7 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Requirements for inspecting, testing.

B. Take samples and perform tests in accordance with Caltrans Standard Specifications.

C. Asphalt Paving Mix Temperature: Measure temperature at time of placement.

D. Asphalt Paving Thickness: ASTM D3549; test one core sample from every 1000 square yards compacted paving.

E. Asphalt Paving Density: ASTM D2950 nuclear method; test one location for every 1000 square yards compacted paving.

3.8 PROTECTION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Immediately after placement, protect paving from mechanical injury for 6 hours or until surface temperature is less than 140 degrees F.

3.9 CONTRACTOR'S RESPONSIBILITY

A. Settlement of replaced pavement over trenches within the project warranty period shall be considered the result of improper or inadequate compaction of the subbase or base materials. The Contractor shall promptly repair all pavement deficiencies noted during the warranty period.

END OF SECTION

SECTION 33 01 10

DISINFECTION OF WATER UTILITY DISTRIBUTION PIPING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes disinfection of potable water transmission system, testing, and reporting results.

B. Related Sections

1. Section 33 14 00 – Water Piping Systems

1.2 MEASUREMENT AND PAYMENT

A. Measurement and Payment for the work detailed in this Specification Section shall be included in the Bid Item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 REFERENCES

A. American Water Works Association:

1. AWWA B300 – Hypochlorites.
2. AWWA B301 - Liquid Chlorine.
3. AWWA B302 - Ammonium Sulfate.
4. AWWA B303 - Sodium Chlorite.
5. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
6. AWWA C651 - Disinfecting Water Mains.

B. California Waterworks Standards

C. AWWA, Water Pollution Control Federation, and other applicable Standard Methods for the Examination of Water and Wastewater.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures.

B. Name and experience of competent person(s) responsible for the disinfection process and performing the required bacteriological sampling. Engineer shall approve in advance.

C. Product Data: Submit procedures, proposed chemicals, and treatment levels for review.

D. Test Reports: Indicate results comparative to specified requirements.

E. Certified results for all bacteriological sampling prior to placing the new pipeline into service.

F. For each section of pipe chlorinated, the Contractor shall inform the Engineer in writing of the locations for taps to be installed and utilized for the procedure.

G. Contractor shall submit a disinfection plan and schedule for approval by the Engineer a minimum of fourteen (14) calendar days in advance of the planned performance of the Work. The plan shall detail proposed disinfection procedures including injection and sampling points, proposed chemicals and amounts, proposed hold times, proposed sectioning of the system, and proposed water disposal and dechlorination procedures.

1.5 CLOSEOUT SUBMITTALS

A. Disinfection Report:

1. Type and form of disinfectant used.

2. Date and time of disinfectant injection start and time of completion.

3. Test locations.

4. Name of person collecting samples.

5. Initial and 24-hour disinfectant residuals in treated water in ppm for each outlet tested.

6. Date and time of flushing start and completion.

7. Disinfectant residual after flushing in ppm for each outlet tested.

B. Bacteriological Report:

1. Date issued, project name, and testing laboratory name, address, and telephone number.

2. Time and date of water sample collection.

3. Name of person collecting samples.

4. Test locations.

5. Initial and 24-hour disinfectant residuals in ppm for each outlet tested.

6. Coliform bacteria test results for each outlet tested.

7. Certify water conforms, or fails to conform, to bacterial standards of California Department of Public Health.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with AWWA C651.

B. The competent person(s) responsible for disinfection processes and bacteriological testing shall be familiar with AWWA C651.

C. The Engineer shall approve of the disinfection plan prior to implementation.

D. The Engineer shall observe the disinfection and bacteriological sampling procedures.

1.7 QUALIFICATIONS

A. Testing Laboratory: Laboratory, certified by State of California, for all chemical and biological tests run.

B. Submit bacteriologist's signature and authority associated with testing.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS

A. Chemicals: AWWA B300, Hypochlorite, AWWA B301, Liquid Chlorine, AWWA B302, Ammonium Sulfate, and AWWA B303, Sodium Chlorite.

B. Safety Data Sheets (SDS) of any chemical used shall be available onsite.

C. Competent person(s) responsible for the disinfection process shall be fully trained in first aid requirements and procedures to address exposure to chemicals.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements.

B. Verification of existing conditions before starting work.

C. Verify piping system has been cleaned, inspected, and pressure tested.

D. Perform scheduling and disinfecting activity with start-up, water pressure testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.2 DISINFECTION

A. Before being placed into service, all new water pipelines shall be chlorinated using either the Tablet Method, Continuous-Feed Method, or the Slug Method of chlorination as specified in AWWA C651. The Engineer shall approve the procedure in advance.

1. The Contractor will determine the location of the chlorination and sampling points in the field. The Contractor shall install taps for chlorinating (depending on the method used), sampling and expulsion of air and shall uncover, backfill and plug the taps as required. All taps shall be installed with backflow preventers (backflow preventers to be approved by the Engineer prior to making the tap).

2. Prior to disinfecting the water main, the main shall be completely filled to remove all air pockets and then flushed to remove particulate. The flushing velocity in the main shall not be less than 3.0 ft/s unless the Engineer and/or Owner determine that the conditions do not permit the required flow to be discharged to waste.

Table 3.01-1 Required flow to flush pipelines (40 psi residual pressure in water main)

Pipe Diameter (in)	Flow Required to Produce 3.0 ft/s (Approximate velocity in main)
4	100 gpm
6	300 gpm
8	500 gpm
10	800 gpm
12	1000 gpm
16	1900 gpm

** AWWA C651, AWWA Standard for Disinfecting Water Mains.*

3. All valves and hydrants within the treated section shall be operated to ensure disinfection of the appurtenances.

B. The interior of all pipe, fittings and valves used in making a repair or tie-in shall be swabbed or sprayed with a one percent (1 %) hypochlorite solution before they are installed.

3.3 FINAL FLUSHING

A. Following the chlorination period, all highly chlorinated water shall be flushed from the lines at their extremities and replaced with water from the transmission system.

1. Flushing the main is to be accomplished at as high a velocity as possible consistent with the ability of the Contractor to collect the discharge water for proper disposal.

2. All treated water flushed from the lines shall be disposed of by approved means provided in AWWA C655.

3. Flushing shall be done in strict conformance with all applicable local, State, and federal regulations. No discharge to any storm sewer or natural watercourse will be allowed.

B. The discharge of chlorinated water will be harmful to vegetation and wildlife. Measures must be taken to impound the highly chlorinated water and to neutralize the chlorine prior to discharge of the water.

C. Federal, state and local environmental regulations may require special provisions or permits prior to the disposal of chlorinated water.

D. Coordinate disposal of chlorinated water with the Owner and Engineer. Legally dispose of chlorinated water in accordance with regulatory agency requirements.

E. Neutralize the chlorine residual of the water being disposed with one of the chemicals listed below:

1. Ascorbic Acid (Vita D-Chlor or equal)

2. Sodium Thiosulfate

3. Sodium Bisulite

4. Sodium Metabisulfite

5. Sodium Sulfite

F. After final flushing and before pipeline is connected to existing system, or placed in service, employ an approved independent testing laboratory to sample, test and certify water quality suitable for human consumption.

3.4 BACTERIOLOGICAL ANALYSES

A. After the 24-Hour disinfection period and all chlorine solution has been thoroughly flushed, the bacteriological sampling and analysis of the replacement water may then be performed.

1. Bacteriological sampling shall be made by the Contractor's competent person(s) in full accordance with AWWA C651- Section 5.1, Bacteriological Tests and under the supervision of the Engineer.

2. Analysis shall be performed by an independent commercial laboratory certified by the State Department of Environmental Protection and U.S. Environmental Protection Agency for analyzing public drinking water supplies. All results shall be provided to the Engineer for review.

3. Two consecutive sets of acceptable samples, taken at least 24 hours apart, are required prior to placing the main into service. Failure of any one of the bacteriological test samples shall require re-chlorination and retesting by the Contractor.

4. The line shall not be placed in service until the bacteriological requirements of AWWA C651 are met. If the pipeline does not pass the bacteriological sampling, the Contractor is responsible for re-disinfecting and testing the line at no additional cost to the Owner until the requirements are met.

END OF SECTION

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SECTION 33 01 30

SEWER CLEANING

PART 1 GENERAL

1.1 DESCRIPTION

A. SCOPE:

This section specifies the requirements for cleaning of sewer pipes prior to CCTV and after rehabilitation. Some segments of the existing sewer main may be in poor condition. The Contractor shall take extra care for cleaning and CCTV inspection.

B. REQUIREMENTS:

The Contractor shall clean the sewers specified for CCTV inspection and replacement. All materials dislodge during cleaning shall be removed from the sewer and disposed of by the Contractor. Sewer cleaning methods shall include water jetting and foam pigging. The Contractor may propose another method for acceptance by the Engineer.

CCTV inspection is not required during cleaning operations. However, the Contractor shall at their own expense, inspect the sewer to view current line conditions prior to rehabilitation.

1.2 MAJOR BLOCKAGE

A. A major blockage shall be defined as an obstruction within the sewer which cannot be removed by cleaning with commercially available hydraulic or mechanical cleaning equipment.

1.3 SUBMITTALS

A. Submit written description of cleaning procedure and all equipment to be used.

PART 2 PRODUCTS

2.1 EQUIPMENT:

A. GENERAL:

All equipment specified in this section shall be in good working condition and manufactured or fabricated to withstand the severity of the work covered under this section.

B. HYDRAULIC AND MECHANICAL CLEANING:

All hydraulic cleaning equipment shall be truck mounted. Water jet cleaning equipment shall include a water tank, auxiliary engine, pumps, and hydraulically driven hose reel. The Contractor shall provide a minimum of 600 feet of high-pressure hose and a selection of high velocity nozzles, each having a capacity of 50 gallons per minute at working pressures of 1,000 to a maximum 1,500 pounds per square inch. Pressure to the nozzle shall be regulated by a relief valve adjustable from 1 to 1,500 psi. Nozzles shall be capable of producing a jet stream angle of 15 to 45 degrees from the horizontal. The Contractor shall also provide a high velocity gun with sufficient discharge and pressure to thoroughly clean manhole interiors.

C. ROOT REMOVAL:

If root removal is deemed necessary, the Contractor shall employ sewer-cleaning equipment to cut all roots encountered back to the pipe surface.

D. DEBRIS REMOVAL:

The Contractor shall provide suitable equipment to catch and remove all debris dislodged during cleaning operations from the nearest downstream manhole. Equipment or methods which require a member or members of the Contractor's crew, to physically excavate debris from within the manhole is prohibited. All debris shall be promptly removed from the sewer from the nearest manhole and shall be disposed of off-site in a lawful manner. Hauling containers shall be watertight.

PART 3 EXECUTION

3.1 GENERAL:

The Contractor shall at all times conduct their work so as to prevent any blockage and minimize surcharging in the sewer manholes and connecting sewer pipelines. Damage to existing facilities as a result of Contractor's work shall be promptly repaired in kind at the Contractor's expense. Prior to cleaning operations, the Contractor shall remove gripper plugs at cleanouts along the main pipeline being cleaned.

3.2 CLEANING:

Cleaning shall remove all sludge, rocks, debris, roots, grease accumulations and obstructions from the sewer. Sewer cleaning methods may include water jetting, rodding, or bucketing. Unless otherwise directed by the Engineer, the Contractor shall select the most effective of these cleaning methods according to the prevailing site condition. Where bucketing is warranted, bucket machines shall be used to remove the major portion of debris. Bucket operations shall proceed in the upstream direction in one sewer reach at a time. The operation shall continue until the buckets can pass the entire reach with minimum collection of debris. Upon completion, the line shall be hydraulically cleaned.

During cleaning operations, the Contractor shall provide a means of catching and removing the dislodged debris conveyed with the sewer flow, to the nearest downstream manhole. The method chosen shall not allow the transport of debris of downstream sewer reaches. All debris shall be disposed of at the end of each day.

END OF SECTION

SECTION 33 01 31

CCTV INSPECTION OF EXISTING AND REHABILITATED SEWERS

PART 1 GENERAL

1.1 DESCRIPTION

A. SCOPE

The contractor shall perform Closed Circuit Television (CCTV) inspections of the project sewer mains and record any defects discovered. The Contractor shall perform CCTV inspections of all sewer mains and laterals to be lined prior to CIPP lining, to verify existing main conditions and lateral locations and conditions, and after completion of CIPP lining to verify compliance with CIPP lining specifications.

B. REQUIREMENTS

The Contractor shall inspect the sewer interior using a color CCTV and document the inspection on a digital recorder. All inspection video shall be submitted in MPEG file format (.mpg) and saved on USB flash drives for submittal. USB flash drive submittals on proprietary software are not permitted. Each inspected sewer reach, manhole to manhole, shall have an associated MPEG file. Electronic PDF (.pdf) files of each inspection log and digital photographs (.jpg) files shall accompany the video inspections for each sewer reach (manhole to manhole) inspected.

The purpose of the pre-rehabilitation inspections shall be to verify condition of the existing sewers; assess cleaning needs; verify the need to perform point/spot repairs to seal cracks and holes causing severe infiltration; locating and logging defects such as obstacles and breaks; and to provide a permanent record of the existing sewer condition as it relates to line dimensions, material, changes and connections. If modification or repairs such as section repairs, point repair grout injection, or other repairs are performed prior to CIPP lining, the pre-rehabilitation inspection will be repeated to accurately record conditions that will be corrected to confirm repair quality at no additional cost to Owner.

The purpose of the post-rehabilitation inspections will be to verify condition of the lining of the sewer and to provide a permanent record of the rehabilitated sewer conditions.

1.2 QUALITY ASSURANCE

A. Contractor’s Qualifications: The Contractor shall have a minimum of three (3) years of experience in such work necessary to successfully meet this specification and provide references for three (3) sewer inspection projects involving remote CCTV pan and tilt inspection.

B. The Contractor shall have all operators who are responsible for locating and logging defects into the data collection software successfully trained and certified through National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP).

1.3 SUBMITTALS

A. Furnish the following Qualifications Statement with bid.

1. Submit list of at least five (3) similar pipeline projects within the past five (5) years that required remote pan and tilt inspection. The reference projects shall contain a minimum of 3,000 linear feet of CCTV pan and tilt.

2. Submit resume(s) and project references for the field personnel who will be employed for this project, including the NASSCO PACP Certification number for each operator.

B. The following submittals shall be provided in accordance with Section 01 33 00 Submittal Procedures:

1. Submit an example of previous work for approval. The example shall consist of one MPEG video of previous sewer inspection work complete with audio commentary and inspection log(s). The submitted example shall be the work of the field supervisor or foreman to be used on this project. Contractor shall be responsible for modifications to equipment and/or inspection procedures to achieve report material of acceptable quality.

2. Manufacturer's product literature for all video equipment including but not limited to cabling, camera, monitor, footage counter, video titling device, and recorder.

3. Written plan for verification of active laterals.

C. TV inspection reports as specified in Section 3.7 shall be submitted each week covering the previous week's work.

PART 2 PRODUCTS

2.1 SEWER MAIN AND LATERAL CCTV CAMERA

A. The camera(s) shall be operative in 100 percent humidity/submerged conditions. The CCTV camera equipment shall provide a view of the pipe ahead of the equipment and of features to the side and rear of the equipment through turning and rotation of the lens. The camera shall be capable of tilting at right angles along the axis of the pipe while panning the camera lens through a full circle about the circumference of the pipe. The lights on the camera shall also be capable of panning 90 degrees to the axis of the pipe. If the equipment proves to be unsatisfactory, it shall be replaced with adequate equipment. The camera unit shall have sufficient quantities of line and video cable to inspect sewers with access as far apart as 800 feet.

The CCTV camera, electronic systems and monitor shall provide an image that meets the following specifications:

1. The gray scale shall show equal changes in brightness ranging from black to white with a minimum of five stages.

2. With the monitor control correctly adjusted, the six colors - Yellow, Cyan, Green, Magenta, Red, and Blue, plus Black and White, shall be clearly resolved with the primary colors in order of decreasing luminance. The gray scale shall appear in contrasting shades of gray with no color tint.

3. The picture shall show no convergence or divergence over the whole of the picture. The monitor shall be at least 13 inches diagonally across the picture tube.

4. The live picture on the CCTV monitor shall be capable of registering a minimum of 500 lines horizontal resolution and be a clear, stable image with no interference.

B. Lighting intensity shall be remote controlled and shall be adjusted to minimize reflective glare. Lighting and camera quality shall provide a clear, in-focus picture of the entire inside periphery of the sewers and laterals for all conditions except submergence. Under ideal conditions (no fog in the sewer) the camera lighting shall allow a clear picture up to five pipe diameter lengths away for the entire periphery of the sewer. The lighting shall provide uniform light free from shadows or hot spots.

C. Camera focal distance shall be remotely adjustable through a range of 6 inches to infinity.

D. The monitor and software shall also be able to capture and save screen images of typical sewer details and all defects. Screen image files shall be named using upstream manhole number and footage and submitted on USB flash drive following Paragraph 3.8, this section.

2.2 VIDEO RECORDINGS

A. The video and audio recordings of the sewer inspections shall be made using digital video equipment. The digital recording equipment shall capture sewer inspection on USB flash drive with each sewer reach inspection recorded as an individual movie file (.mpeg, .mpg). The files shall be named according to Upstream/Downstream manhole numbers or per requirements established elsewhere in the Specifications.

B. The audio portion of the composite video shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report. Audio shall be recorded by the operating technician on the inspection video as the sewer is inspected and shall include the sewer location, identification of beginning and terminating manholes including location (address or cross streets), inspection direction, length of inspection, side sewer identification, flow information, complete descriptions of the sewer line conditions as they are encountered, description of the rehabilitation work, reason for termination, and other relevant commentary to the inspections. In addition, the audio reports shall include the distance traveled on the specific run, a description of abnormal conditions in the sewer and side sewer connections as they are encountered, explanations for pausing, backing up, or stopping the survey, and the final measured center to center distances between consecutive manholes. Audio dubbing after the inspection is prohibited

C. The reaches shall be inspected from upstream to downstream, wherever possible. The images recorded on the CCTV video shall be the same images that are required to be displayed on the CCTV monitor. The footage counter shall be zeroed at the beginning of each inspection and at each intermediate manhole along the inspection run. The video recorder shall be paused if the camera progress is stopped for a period longer than 30 seconds due to breakdown of the equipment, or any purpose other than analyzing conditions of the sewer. The operator shall document the delay on the recording when progress resumes

D. The equipment used for the inspection must provide for simultaneous monitoring of the in-sewer inspection by the Engineer or the District. Equipment that does not allow for out of sewer observation of the inspection will not be allowed.

E. A table of contents shall be included with each USB flash drive. The table of contents shall include the following information:

1. Content (CCTV)

2. Contractor name
3. Type of survey (CCTV)
4. Interceptor name
5. Reaches included (from Manhole Number ## to Manhole Number ##)
6. Date of survey
7. Work order number (if applicable)
8. Sheet number in Drawings

F. The inspection video shall be delivered on a medium that is not re-recordable. Contractor shall maintain a copy of all inspection documentation (USB flash drive, databases, and logs) for the duration of the work and warranty period.

PART 3 EXECUTION

3.1 GENERAL

A. The CCTV camera shall be positioned as close to the spring line as possible while maintaining the required equipment stability. If the flow levels are above the spring line, then the vertical position of the camera shall be just above the free water surface. The Contractor shall identify and record wrinkles, folds, drips, and other defects found during the CCTV inspection. The Contractor shall inspect and document all manholes encountered during the inspection activities. The camera shall pan the periphery of the manhole from casting to invert. Inspections shall be conducted during low flow periods to increase the viewable sidewall area of the pipe.

B. The speed that the camera or survey unit is conveyed through the sewer while performing general inspections shall be uniform and shall be limited to a maximum of 30-feet per minute. The survey unit shall be slowed, stopped, or backed-up to perform detailed inspections of significant features. The camera shall be stopped at all defects, changes in material, water level, size, side connections, manholes, junctions, or other unusual areas. When stopped at the defect or feature, the operator shall pan the camera to the area and along the circumference of the pipe. The operator shall also record audio of the type of defect or feature, clock position, footage, extent or other pertinent data. Still photographs or screen captures shall be taken at all defects and general line condition photographs shall be taken at least every 200 feet

C. During period of camera advancement along the reach, the operator shall pan to view the flow line conditions along both sides of the pipe and the crown at regular intervals. This may be done while the camera is moving forward if the recorded picture quality is not adversely affected. When viewing the flow line area, the camera shall be returned to the forward position providing a full view of the pipe before panning to view the opposite side of the sewer or the crown conditions

D. At the Contractor's discretion or direction of the Engineer, the camera shall be stopped or backed up (when conditions allow) to view and analyze conditions that appear to be unusual or uncommon for a sound sewer. The lens and lighting shall be readjusted, if need be, to ensure a clear, distinct, and properly lighted feature. The video recorder shall be paused if the camera progress is stopped for a period longer than 30

seconds due to breakdown of the equipment, or any purpose other than analyzing conditions of the sewer. The operator shall document the delay on the recording when progress resumes.

E. The Contractor shall be responsible for all traffic control measures required.

3.2 LINEAR MEASUREMENT

A. The Contractor shall measure the camera progress along the full length of each reach. The length counter shall be zeroed at the beginning of each inspection, and at any intermediate manhole. In the case of resuming an inspection at an intermediate point along the pipeline, the length counter shall start at the last point recorded. The Contractor shall ensure that the counter starts to register immediately when camera progress starts. The device shall be observable at ground level. Markings on the cable, instruments requiring observation inside a manhole, or correction of the length for the depth of the manhole are not acceptable.

B. Prior to commencing inspections, the Contractor shall demonstrate compliance with the linear measurement tolerance specified below:

1. The equipment shall measure the location of the camera unit in 1-foot increments from the beginning (upstream end) of each continuous section. This footage location must be displayed on the CCTV monitor and recorded.

2. The accuracy of the measured location shall be within + 0.5% of the actual length of the sewer reaches being surveyed, or 1 foot, whichever is greater.

3.3 CCTV MONITOR DISPLAY

A. The images displayed on the CCTV monitors shall be a view of the pipe above the water surface as seen by the CCTV camera as the unit is conveyed through the sewer.

B. The camera lighting shall be fixed in intensity prior to commencing the survey and the white balance set to the color temperature emitted. To ensure color constancy, ideally no variation in illumination shall take place during the survey.

3.4 DATA DISPLAYS

A. The CCTV images shall include an initial data display that identifies the sewer reach being surveyed and a survey status display that provides continuously updated information on the location of the survey unit as the survey is being performed. These data displays shall be in alphanumeric form. The size and position of the data shall not interfere with the main subject of the monitor picture

B. The on-screen display should be white during inspections where the background behind the display is dark and, conversely, black where the background is light.

C. At the beginning of each reach of sewer being inspected, the following information shall be electronically generated and displayed on the CCTV monitors as well as included in the audio track:

1. Date of survey

2. Interceptor name/location

3. Manhole number to manhole number (in order of inspection)
4. Direction of survey (upstream or downstream)
5. Time of start of survey.

D. During inspections, the following information shall be electronically generated, automatically updated, and displayed on the CCTV monitors:

1. Survey unit location in the sewer line in feet and tenths of feet from adjusted zero.

2. Sewer diameter

3. Abbreviated manhole reference numbers (upstream and downstream manholes in order of survey direction).

3.5 MANHOLE NUMBERING, INSPECTION FORMS AND DEFECT CODES

A. The Contractor shall use the District's manhole numbering system when performing the inspections for this project. The entire manhole number must be used when referring to an upstream/downstream manhole for a pipe reach. Defect codes shall conform to those specified in the NASSCO PACP specification.

3.6 PRE-CLEANING INSPECTION

A. If the camera cannot pass the entire sewer reach from its starting direction, the reach shall be inspected as much as possible from both upstream and downstream directions. If the pipe cannot be fully inspected from either the upstream or downstream manholes, the Contractor shall notify the Engineer. Such notification shall be written and include manhole to manhole reach numbers and the reason why inspection cannot be completed

B. If any Contractor equipment becomes stuck in the sewer, the Contractor shall be responsible for all costs associated with extracting the equipment from the sewer.

C. Any damages to public or private property resulting from Contractor activities shall be repaired by the Contractor at no cost to the District

D. The District and Engineer shall be given the option to be present and observe pre-construction CCTV inspection.

3.7 REPORT

A. Two copies of the pre-rehabilitation and post-installation (4 copies total) inspection videos in sequential order from upstream manhole to downstream manhole saved in mpeg format on USB flash drives; electronic version (.jpg) of still photographs saved on USB flash drives; a digital Microsoft Access database conforming to the NASSCO PACP database standard populated with all inspection and defect information; and hard copies and electronic pdf files of the inspection logs shall be submitted to the Engineer for review and approval. USB flash drives or sections thereof that do not conform to the specifications shall be re-recorded in the field at the Contractor's expense. Original USB flash drives and re-recorded runs shall be edited to provide a record with all inspections in sequential order from upstream to downstream. USB flash drives and files not in sequential order are unacceptable.

B. The TV inspection report shall include video recordings, pictures and any District required inspection forms and defect codes. Contractor shall provide equal documentation on both the videos and forms. Contractor shall maintain a copy of all report material. The

Contractor shall provide comments as necessary to fully describe the existing condition of the sewer, both through the voice over on the videos and on the inspection forms. Photographs shall further document both typical sewer features, and defects. The photographs shall be copied to a USB flash drive and submitted to the Engineer along with the videos and logs.

C. The TV inspection video shall be capable of providing an accurate, uniform and clear record of the sewer's internal condition. It shall be the sole judgment of the District as to whether the recorded video is of acceptable quality. Any unacceptable video shall require re-survey of the sewer pipe at the Contractor's expense.

3.8 CCTV RECORDINGS

A. CCTV inspections shall be recorded in MPEG (.mpg) format.

B. Each recording shall continuously display the following:

1. Name of the sewer.
2. District project number.
3. Manhole number (on construction drawings) from which the camera is traveling.
4. Manhole number to which the camera is traveling.
5. Distance measurements.
6. Date of recording and inspector.
7. Pipe diameter.
8. Pipe material.

C. Video recordings shall include an audio track recorded by the inspection technician during the actual inspection work describing the parameters of the line being inspected (i.e., location, depth, diameter, pipe type), as well as describing connections, defects and unusual conditions observed during inspection.

D. Video recordings shall be professionally labeled showing the project name, the lines recorded on the tape, date, and name of Contractor/Inspector.

E. CCTV data for the existing sewer main is available for download at the following link:

https://www.mckinleyvillecsd.com/bids-and-rfps

Pipeline conditions may have changed from the time the CCTV data was gathered. The CCTV data is for reference only.

END OF SECTION

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SECTION 33 01 32

CURED-IN-PLACE PIPE (CIPP) LINING

PART 1 GENERAL

1.1 GENERAL REQUIREMENT

A. This specification covers the work necessary to furnish, install, and complete an operational gravity sewer system using cured-in-place pipe (CIPP) lining. This system involves the rehabilitation of existing sewer mains by the installation of a Class IV rehabilitation method as defined by the AWWA M28 using a resin-impregnated flexible composite liner formed to the original conduit. The new CIPP will be seamless, joint-less, tight fitting, and continuous from manhole to manhole. The new CIPP shall serve as a fully functional stand-alone pipe and will not depend on the host pipe for any structural capacity. The Contractor shall provide all materials, labor, equipment, and services necessary for cleaning and television inspection of sewer mains and laterals to be lined, open cut section repairs, point repairs using chemical grout injection, liner installation, reinstatement of laterals, reconnection of sewer pipelines, and final television inspection and testing of lined pipe system.

B. The Owner performed a CCTV inspection of the sewer mains within the project area in January, 2022. This footage is available for download at the Owner's website: https://www.mckinleyvillecsd.com/bids-and-rfps.

1. By submitting a bid for the project, contractors acknowledge that they have reviewed the available footage. The District was not able to obtain CCTV footage of all sewer mains that are to be rehabilitated as a part of this project. Known areas that may require open cut repairs prior to CIPP lining have been identified on the Drawings and have been accommodated in the Bid Schedule and Specification 01 22 00 (Measurement and Payment).

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for CIPP lining shall be included in the bid item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.3 REFERENCES

A. The following references are part of this Specification. The latest edition of the following references shall be used:

ASTM D543	Standard Test Methods for Resistance of Plastics to Chemical Reagents
ASTM D578	Standard Specification for Glass Fiber Strands
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D3681	Test Method for Chemical Resistance of "Fiber-glass" (Glass−Fiber−Reinforced Thermosetting-Resin) Pipe in a Deflected Condition

ASTM D5813 Standard Specification for Cured-In-Place Thermosetting Resin Sewer Pipe

ASTM F412 Terminology Relating to Plastic Piping Systems

ASTM F1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of Resin-Impregnated Tube

ASTM F1743 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-In-Place Installation of Cured-In-Place Thermosetting Resin Pipe (CIPP).

ASTM F2599 Standard Practice for the Sectional Repair of Damaged Pipe by Means of an Inverted Cured-In-Place Liner

1.4 RELATED SECTIONS

A. Section 01 55 60 – Temporary Sewage Bypass Pumping System

B. Section 33 01 30 – Sewer Cleaning

C. Section 33 01 31 – CCTV Inspection of Existing and Rehabilitated Sewers

D. Section 33 01 33 – Manhole Rehabilitation

1.5 SUBMITTALS

A. Furnish the following Qualifications Statement with bid.

1. Submit company history stating years in service, including a minimum of five (5) years of active continuous experience in the commercial installation of CIPP liners, under the Contractor's license.

2. Submit evidence of factory authorization of licensing by Manufacturer of CIPP lining system to install product.

B. Provide material submittals and description of method of repair for point repairs that require grout injection to eliminate infiltration.

C. Provide submittals on all lining materials and resins, and furnish manufacturer certification that the liner materials are in compliance with the specifications, codes, and standards referenced herein. The submittals shall include details of all component materials and construction details including manufacturer's recommendations for storage procedures and temperature control, handling and inserting the liner, curing details, sewer and lateral reconnection methods, trimming, terminations, finishing, and methods of necessary repairs. Provide manufacturer's certification, field measurements, and pipe sizing calculations which demonstrate that the liner has been properly sized to avoid the creation of wrinkles or folds and to avoid gaps between the liner and the host pipe.

D. Submit certification by the manufacturer that all furnished lining materials were manufactured, sampled, tested, and inspected in accordance with ASTM F 1216 or ASTM F 1743. The manufacturing date of the lining materials shall be included in the certification. An authorized agent of the manufacturer shall sign certification. Verification of product conformance by third party testing for the chemical resistance and physical testing requirements (ASTM test methods F 1216, D790 and D2990, or the corresponding ASTM F 1743 test methods) along with a report of test results shall also be provided to the Engineer a minimum of 10 working days prior to the commencement of the work.

E. Submit engineering calculations for the design of the liner thickness. Design calculations shall be checked and approved by a Registered Professional Civil Engineer in the State of California on behalf of the Contractor. Liner design calculations shall be supported by field analysis, technical assumptions, Section 2.3 of this specification and ASTM F 1216-93 or the corresponding ASTM F 1743 sections. The Engineer shall give final acceptance of the design calculations.

F. Submit manufacturer's recommendations for the installation of the CIPP including resin application curing process details (including temperature control), storage procedures, lateral reinstatement methods, trimming and finishing, and quality control measures to be used for lining of mainlines and services.

G. Submit certification from the manufacturer that the installer is licensed to perform the work.

H. All CIPP installation leads shall be NASSCO ITCP certified for CIPP. Furnish a copy of the lead's certificate. The lead shall be present on site at all times during the installation of the CIPP.

I. All CCTV inspection shall be performed by a CCTV inspection operator who is NASSCO PACP certified. Submit a copy of the operator's certificate.

J. Submit certification from the manufacturer that the resin material complies with the required application, meets the intended service condition and the physical requirements set forth in this specification.

K. The resin supplier shall provide a referenced "Polyester Resin Standard Infrared Spectrum" chemical fingerprint for the proposed resin, which is to be used to verify the resin throughout the contract.

L. Submit a detailed plan depicting complete layout of the proposed construction with clear and accurate dimensions, including work areas, equipment set-up, and the locations of the access points.

M. Submit Manufacturer's written repairs for:
1. Structural repairs that restore hoop strength
2. Repairs required to restore hydraulic capacity
3. Delamination

N. Submit Manufacturer's written repairs for non-structural spot repairs of manufacturing and installation defects:
1. Less than 2.0 square inches
2. Greater than 2.0 and less than 10.0 square inches
3. Spot repairs 10.0 square inches and greater

1.6 QUALITY ASSURANCE

A. The Contractor shall meet the experience requirements as identified in Section 1.5A.

B. The Contractor's authorized representative shall be present at the site of the work at all times while CIPP work is actually in progress on the Contract.

C. The finished composite liner shall be continuous over the entire length of an insertion run between two manholes or access points and shall be free from visual defects such as foreign inclusions, dry spots, pinholes, delamination, and wrinkles within perimeter of pipe.

D. Remove and replace:

1. Structural defects that reduce hoop strength
2. Defects that reduce hydraulic capacity
    a. Cosmetic wrinkling is acceptable where this may be due to non-uniform size of the existing pipeline and horizontal and/or vertical bends. Folds and wrinkles shall be limited in size so as not to extend out from liner wall ½" or 2% of diameter, whichever is greater.
3. Delamination

E. Repair non-structural spot defects:

1. Less than 2.0 square inches
2. Greater than 2.0 inches and less than 10.0 square inches
3. Spot repairs 10.0 square inches and greater

F. External Buckling Design - Acceptable third-party testing and verification of the design analysis techniques (ASTM F 1216, Section X1.2.2 or the corresponding ASTM F 1743). Laboratory testing of field samples shall be completed for 1 of every 3 liners.

G. Provide the Engineer a USB storage device with the unedited curing data and pre- and post- installation video. Provide any software which may be necessary to analyze the data.

PART 2 PRODUCTS

2.1 GENERAL

A. The CIPP liner system and installation method shall be a commercially proven system.

B. Liner thickness measurements shall be made in accordance with 8.1.2 of ASTM D5813. No measurement shall be less than 87.5% of the required mean value as specified in approved submittal.

C. The tube shall be sized such that when installed, it will fit tightly against the host conduit. The outside diameter of the tube shall be at least 95% of the inner diameter of the host conduit. The tube shall be constructed to withstand installation pressures and have sufficient strength to bridge missing pipe.

2.2 MATERIALS

A. The Contractor shall furnish materials having a composition, physical and chemical properties meeting the requirements set forth in this specification. By submission of a bid proposal, the Contractor guarantees that the material supplied will meet the requirements of this specification. The District reserves the right to conduct periodic checks on the quality of materials furnished under this contract, or to have material quality checked by outside sources, at District's expense. Failure to meet the requirements of this specification may result in termination of the contract.

B. Liner Tube:

1. The liner tube shall consist of one or more layers of flexible needled felt or an equivalent woven and/or nonwoven material capable of carrying resin, withstanding installation pressures, curing temperatures, and is compatible with the resin system used. The liner shall be fabricated to a size that, when installed, will tightly fit the internal circumference of the existing pipe without any annular

space between the liner and existing pipe wall. The tube shall be homogenous across the entire wall thickness containing no immediate or encapsulated elastomeric layers. No material shall be included in the total that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.

2. The resin used shall be compatible with the rehabilitation process and shall be able to cure in the presence or absence of water, and the initiation temperature for cure shall be as recommended by the resin manufacturer and reviewed by the Engineer.

3. The liner shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to sewage gases containing quantities of hydrogen sulfide, carbon monoxide, methane, petroleum hydrocarbons, saturation with moisture, and diluted sulfuric acid. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.

4. The minimum tube length shall be that deemed necessary by the Contractor to effectively span the distance from the inlet to the outlet of the respective manholes, or access points, unless otherwise specified. The Contractor shall verify the lengths in the field before impregnation of the tube with resin. Individual insertion runs may be made over one or more manhole sections as determined in the field by the Contractor and as accepted by the Engineer.

5. Prior to insertion, the liner shall be free of all visible tears, holes, cuts, foreign materials, and other defects.

6. Materials and manufacture of the CIPP lining shall conform to the requirements of ASTM D5813.

7. The pipe diameters shown on the plans are nominal diameters. The Contractor shall measure the inside diameter of the existing pipelines in the field so that the liner can be installed in a tight-fitted condition.

8. The outside layer of the tube shall be polyethylene coated with an impermeable and transparent flexible material that is compatible with the resin system used. The plastic coating shall not be subject to delamination after cure.

9. The liner shall have 5-10% excess resin added to account for resin consumed in open joints and pipe defects, per ASTM F1216.

C. Resin:

1. The resin used shall be a thermoset resin system compatible with the rehabilitation process used and designed for a wastewater environment.

2. The resin shall be able to cure in the presence or absence of water and the initiation temperature for cure shall be as recommended by the resin manufacturer and reviewed by the Engineer, but no more than 180 degrees F.

3. The resin system shall be a corrosive resistant, thermosetting, unsaturated polyester resin able to cure in the presence or absence of water, and a catalyst system compatible with the insertion process.

4. Additives required for viscosity control, fire retardance, physical or chemical resistance, or pot life extension may be used provided they do not interfere with visual inspection of the finished, installed product.

5. Joint Seals:
   a. Seal the liner at manhole ends, any other location where two liner segments join, and connections with a compression hydrophilic gasket compatible with the liner. The use of caulking, rope or band type of an end seal will not be allowed.

2.3 DESIGN PARAMETERS

A. The liner material and thickness shall be calculated and designed for use in gravity sanitary sewers and must be in strict conformance with all applicable sections of ASTM F1216, F1743, D3681, D5813, and associated standards. The design shall be based on the following pipe conditions, service requirements and physical conditions:

1. All liners shall be designed and installed as Class IV rehabilitation method as defined by the AWWA M28 for fully deteriorated pipes.

2. Assume no bonding to the existing/original pipe wall.

3. Maximum depth of soil cover above top of pipe as indicated on the plans.

4. All pipes subject to soil load of 120 lbs./cu. ft. and applicable live load.

5. Pipes with a minimum of 2% ovality in the circumference.

6. Modulus of passive soil reaction: 700 psi for pipes less than 10 feet deep and 1000 psi for pipes deeper than 10 feet.

7. External Buckling Design - design analysis techniques per ASTM F 1216, Section X1.2.2 or the corresponding ASTM F 1743.

8. Factor of safety (N) of 2.0 used for calculations.

9. Minimum service life - 50 years.

10. Live load – AASHTO H-20 Highway.

11. Ground water depth: see the Geotechnical Report dated March 24, 2022 appended to these Specifications.

12. The CIPP shall have the capability to both change wall thickness for variations in design considerations and conform to the irregular circumferences within the designated rehab reaches.

13. Minimum thickness shall be the calculated minimum thickness provided in the submittals.

2.4 PHYSICAL PROPERTIES

A. The cured liner tube material shall meet the minimum chemical resistance requirements of ASTM F 1216 or ASTM F 1743, and shall conform to the following minimum structural standards:

Structural Property	Standard	Min. Short Term Value	Min. Long Term Value
Flexural Stress	ASTM D790	4,500 psi	N/A
Flexural Modulus	ASTM D790	250,000 psi	250,000 psi
Impact Strength	ASTM D256	1.9 in. lb.	N/A
Compressive Strength	ASTM D695	4,000 psi	N/A
Tensile Strength	ASTM D638	4,000 psi	N/A
Tensile Modulus	ASTM D638	250,000 psi	N/A

B. Color of Dye: Dyes shall be per manufacturer's written recommendation. The dye shall be stable during cure and shall provide a visual quality assurance of the cured liner.

2.5 GROUTS - GENERAL

A. All grout materials must have the following characteristics:
   1. While being injected, the grout must be able to react /perform in the presence of water (groundwater).
   2. The ability to increase grout mix viscosity, density and gel strength by increased concentration of constituents or the use of approved additives.
   3. The cured grout must withstand submergence in water without degradation.
   4. The resultant grout formation must be homogeneous and prevent the passage of water (infiltration) through the pipe joint.
   5. The grout must not be biodegradable.
   6. The cured grout should be chemically stable and resistant to organics found in sewage.
   7. Residual grout shall be easily removable from the sewer line to prevent blockage of the sewage flow.

B. Handle, mix, and store grout in accordance with the manufacturer's recommendations. The materials shall be delivered to the site in unopened original manufacturer's containers.

2.6 CHEMICAL GROUTS

A. Water based chemical grouts shall have the following characteristics:
   1. A minimum of 15% acrylamide base material by weight in the total grout mix. A higher concentration of acrylamide base material is recommended to increase strength or offset dilution during injection.
   2. The ability to tolerate some dilution and react in moving water during injection.
   3. A viscosity of approximately 2 centipoise, which can be increased with approved additives.
   4. A controllable reaction time from 10 seconds to 1 hour.
   5. A reaction (curing) that produces a homogenous, chemically stable, non-biodegradable, firm, flexible gel.
   6. The ability to increase mix viscosity, density and gel strength by increased concentrations of the mix constituents or by the use of approved additives.
   7. Product Manufacturer:
   8. Avanti AV-100, Avanti AV-118; or equal.

B. Acrylate base grout shall have the following characteristics:

1. A minimum of 10% acrylate base material by weight in the total grout mix.
2. The ability to tolerate some dilution and react in moving water during injection.
3. A viscosity of approximately 1-3 centipoise, which can be increased with approved additives.
4. A controllable reaction time from 10 seconds to 1 hour.
5. A reaction (curing) that produces a homogenous, chemically stable, non-biodegradable, firm, flexible gel.
6. The ability to increase mix viscosity, density and gel strength by the use of approved additives.
7. Product Manufacturer:
8. DeNeef AC-400, DeNeef Gelacryl SR, Avanti AV-160; or equal.

PART 3 EXECUTION

3.1 PREPARATION

A. Notification

1. The Contractor is responsible for contacting businesses whose sewer laterals may be impacted by the lining work within the timeframes as noted in Section 1.3.B.5 of Specification 01 11 00 (Summary of Work). The written notification shall have the following minimum information:

    a. Contractor Name and contact information for questions
    b. Summary of work to be completed
    c. The date and time of when the work will commence
    d. The duration of the impact (start and stop time)

B. Storage and Handling:

1. Rehabilitation materials shall be properly stored and handled to prevent damage in accordance with the manufacturer's recommendations and as approved by the Engineer. Damage is described as, but is not limited to, gouging, abrasion, flattening, cutting, puncturing, or ultra-violet (UV) degradation. Thorough inspection of the rehabilitation materials shall be performed prior to installation.

C. Cleaning and Inspection of Existing Sewer:

1. The Contractor shall be responsible for cleaning, inspecting, confirming the inside diameter and determining the condition of each manhole-to-manhole segment of the existing sewer and each sewer service lateral to be lined. The cleaning process shall include the removal of all roots, solids, grease, or obstructions removable with sewer cleaning equipment that will prevent the insertion of CIPP.

2. A television inspection shall be performed by the Contractor after the sewer cleaning operation and repairs as described in Paragraphs D and E are completed.

3. Perform repairs as necessary prior to lining per manufacturer's written instructions. Engineer shall be notified prior to and shall provide approval for any such repairs that are made.

4. The Contractor shall dispose of all debris removed from the pipeline in accordance with current applicable regulations. Any hazardous waste material encountered during the project that is not reasonably foreseeable based on available information shall be considered as a changed condition. Asbestos-containing pipe does not qualify as a changed condition.

5. The Contractor shall be responsible for removal of roots within the sanitary sewer pipelines as part of the cleaning of the pipeline and no additional compensation will be allowed therefor. Roots shall be removed where revealed by the Contractor's video inspection. Special attention shall be used during the cleaning operation to assure a removal of roots from the joints. Procedures may include, but not be limited to, the use of mechanical equipment such as rodding machines and bucket machines using root cutters and porcupines, and equipment such as high velocity jet cleaners.

D. Pipeline Open Cut Section Repair/Replacement
   1. Open cut sewer repairs may be required where sewer conditions will not permit CIPP liner installation due to broken pipe, offset joint, ovality, etc. These repairs shall consist of excavation, cutting and removal of the problematic section of existing pipe, installing a new section of pipe complete in place including couplers on each end that are compatible with the existing asbestos cement pipe, and all other work required to complete the repair.

E. Grout Injection Point Repairs
   1. The Contractor shall eliminate all infiltration greater than National Association of Sewer Service Companies (NASSCO) prepared Pipeline Assessment and Certification Program (PACP) severity dripper levels (i.e., runner and gusher in severity) prior to installation of the impregnated tube to facilitate the installation. Elimination shall be by the use of grouting via packer head technology utilizing a polyurethane grout compound. The grout shall have the following properties: reacts quickly to form a permanent watertight seal; resultant seal shall be flexible and immune to the effects of acids, alkalis, and organics in sewage; and compatible with CIPP liner resin systems used.
   2. Under no circumstances will an installation be permitted with active infiltration beyond the PACP infiltration dripper level.

F. Manholes:
   1. The Contractor shall protect the manholes to withstand forces generated by equipment, water or air pressure used while inserting the tube. The Contractor shall be fully responsible for any damages to existing utilities caused by the Contractor's operations.

   2. Pipeline cleaning operations: Protect the existing pipeline, maintenance hole, and other improvements from damage. In particular, metallic parts of cleaning equipment may not come in direct contact with pipe or maintenance hole shafts that are plastic, plastic-lined, or plastic-coated. Cleaning operations may not surcharge laterals or otherwise cause flow or gasses to enter service connections.

   3. CIPP shall make a tight seal at manhole openings with no annular gaps or visible leakage of groundwater and shall withstand 5 psig positive and negative pressures. All liner edges shall be cut smooth. An epoxy resin sealant shall be applied all around liner opening (leading edge) for a minimum depth of 1 inch for a seal. Sufficient resin shall be applied to seal and adhere abraded liner edge

(cut-off edge). Apply beads of accepted sealant forming approximately ½-inch fillets. Tool sealant to create smooth transition for flow that will not snag debris.

4. Remove entire liner within entrance and exit manhole leaving a ½-inch to 1-1/2-inch shelf to accept sealant as described above. At any intermediate manhole, remove crown of new liner leaving manhole trough lined. For the latter, seal new liner at all cut edges as described above.

5. Sewage Bypass and Pumping Plan: The Contractor shall conform to Section 01 55 60 – Temporary Sewage Bypass Pumping System, for temporary handling of sewage flows. Each section of liner installed shall be cured and operational by the end of each working day so that bypass pumping is not required during non-working hours.

6. Operational control: Provide and monitor calibrated gauges and valves to maintain temperature and pressures within the manufacturer's recommendations.

3.2 CIPP Installation

A. Resin Impregnation:

1. The uncured resin in the original containers and the unimpregnated fiber-felt tube shall be impregnated by vacuum or other means prior to installation. The materials and "wet-out" procedure shall be subject to inspection by the Engineer. A resin and catalyst system that is compatible with the requirements of the method shall be used. The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall.

2. After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular as possible. A roller system shall be used to uniformly distribute the resin throughout the tube.

3. The impregnated liner bag shall be transported to and stored at the site in such a manner that will not be damaged, exposed to direct sunlight, or result in any public safety hazard. The impregnated liner bag shall be kept cool during shipment and storage at a temperature recommended by the manufacturer.

B. Liner Installation:

1. The impregnated tube shall be inserted through an existing manhole by means of the inverted insertion process. The application of hydrostatic head, compressed air, or other means shall fully extend the liner to the next designated manhole or termination point and inflate and firmly adhere the liner to the pipe wall.

2. Install CIPP lining in accordance with the installation recommendations of ASTM F1216 (inversion method).

3. The liner manufacturer shall provide the minimum pressure required to hold the liner tight against the host pipe and the maximum allowable pressure to avoid damage to the liner. The minimum pressure shall include consideration of potential groundwater pressure on the outside of the liner. See the Geotechnical

Report dated March 24, 2022 xx appended to these Specifications for available groundwater information. The pressure shall be kept within those limits throughout the installation and curing process. The Contractor shall maintain a log of the pressure throughout the process.

C. Liner Curing:

1. The liner shall be cured with steam:
   a. All liner curing shall be done in accordance with the manufacturer's recommendations. These recommendations shall be provided to the Engineer for review prior to liner installation.

   b. After placement is completed, provide a suitable heat source and distribution equipment. The equipment shall be capable of circulating hot steam throughout the section by means of a pre-strung hose which has been perforated in accordance with the manufacturer's recommendations to raise the temperature uniformly above the temperature required to affect a resin cure. This temperature shall be determined by the manufacturer based on the resin/catalyst system employed.

   c. The heat source piping shall be fitted with continuous monitoring thermocouples to gauge the temperature of the incoming and outgoing steam supply. Steam temperature during the cure period shall meet the requirements of the resin manufacturer as measured at the heat source inflow and outflow return lines. The Contractor shall provide standby equipment to maintain the heat source supply as backup to the primary equipment. An additional continuous monitoring thermocouple shall be placed between the impregnated felt tube and the pipe invert at the remote manhole to determine the temperature during the cure. The temperature during the cure shall be in accordance with the resin manufacturer's recommendations.

   d. The initial cure shall be deemed to be completed when inspection of the exposed portions of the liner appear hard and sound and the remote temperature sensors indicate that an exotherm has occurred. The cure period shall be of duration recommended by the resin manufacturer during which time the recirculation of the steam and cycling of the heat exchanger continuously maintain the required temperature.

   e. Temperature shall be maintained during the curing period as recommended by the resin manufacturer and shall follow the heating schedule supplied by the manufacturer.

      1) Continuous temperature monitoring and data collection shall be required during sewer CIPP process. To monitor the temperatures inside the tube wall and to verify proper curing, temperature sensors shall be placed between the host pipe and the liner in the bottom of the host pipe (at the invert) throughout the reach to record the heating and cooling that takes place on the outside of the liner during processing. Discrete temperature readings shall be taken at 6-inch intervals and 30-second sampling rate using

optical fiber cable or equivalent, along the entire length of any CIPP segment installed under this Contract.

D. Cool Down:

1. The hardened liner shall be cooled to a temperature below 100 degrees F before relieving the static head or pressure in the lined pipe and returning normal flow back into the system. Ambient air temperature shall be used for cooling, and water shall not be used to facilitate the cool down process. Care shall be taken in the release of the static head or pressure so that a vacuum will not develop which could damage the newly installed liner.

2. To make a tight seal at the manhole walls, a seal consisting of a resin mixture compatible with the liner/resin system shall be applied in accordance with manufacturer specifications.

3. Wrinkles or folds as noted in Section 1.6 shall be corrected by repairing the area at the Contractor's expense.

3.3 TESTING

A. Material Testing:

1. All material testing shall be performed by a registered independent, third-party laboratory accepted by the Engineer. All labor, materials, and third-party testing laboratory necessary for all testing shall be furnished by the Contractor as part of the Work at no additional cost to the Owner. All materials testing shall be performed by an independent third-party laboratory that can demonstrate experience in the testing of CIPP laminates and that is approved by the CIPP manufacturer; and that is submitted by the Contractor to the Engineer for review and acceptance. Laboratories that will be considered for acceptance include: Ramtech Laboratories, Paramount, CA phone (562) 633-4824; Hauser Laboratory, a Division of Microbac Laboratories, Boulder, CO phone (720) 406-4800; or equal.

2. The Contractor shall provide certified test results of the in-place properties of the lining material from the actual installed liner at the minimum number of locations determined by the Engineer.

3. The installed liner shall be sampled and tested for wall thickness and flexural properties in accordance with the requirements of ASTM F1216 (inversion method) or ASTM F1743 (pulled-in-place) method and ASTM D790.

4. The Contractor shall replace the pipeline in any reach that the liner samples fail to meet the project requirements.

5. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate certainly, or the probe or knife blade moves freely between the layers. If separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.

B. Field Testing:

1. Post-installation TV inspection for the rehabilitated pipes shall be performed and submitted to the Engineer per Specification Section 33 01 31 – CCTV Inspection of Existing V1 and Rehabilitated Sewers V2. Finished Cured CIPP shall fit tightly to the existing pipeline as indicated by reflection of the shape and surface of the existing pipeline in the liner. The liner shall be continuous and free from visual defects, foreign inclusions, dry spots, pinholes, delamination, sags, cracks, kinks, blisters, and holes.

2. Folds and wrinkles shall be limited in size so as not to meet the requirements in Section 1.6.

3.4 FINAL CLEANING

A. After acceptance of the installation work and testing, the Contractor shall cleanup and reinstate the entire project area affected by the operations. All excess material and debris shall be disposed of away from the site by the Contractor at an appropriate location.

3.5 AIR MONITORING AND PROTECTION

A. As recommended by NASSCO, the Contractor shall adhere to the following requirements:
   1. Air monitoring shall be utilized at the initial opening of the CIPP liner transport vehicle or storage container.
   2. Suitable PPE shall be worn by those opening and immediately entering the CIPP liner transport vehicle or storage container.
   3. Emission stack shall extend a minimum of 6 feet in height.
   4. A minimum perimeter of 15 feet shall be established around exhaust manholes and emission stacks during curing. Any person entering this perimeter for longer than 5 minutes shall wear appropriate PPE.

B. Ventilate each rehabilitated section of sewer main for a minimum of two hours after lining is complete.

END OF SECTION

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SECTION 33 01 33

MANHOLE REHABILITATION

PART 1 GENERAL

1.1 WORK INCLUDED

A. SCOPE:

This section includes materials, testing, and installation of corrosion barrier geopolymer mortar for concrete structures.

1.2 RELATED SECTIONS

A. Section 33 01 32 – CIPP Lining

1.3 SYSTEM DESCRIPTION

A. Furnish and install complete operating corrosion resistant geopolymer mortar for concrete structures in compliance with manufacturer’s installation requirements and compliance with applicable building codes and standards.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary trades and crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this section. A minimum of three (3) years of active continuous experience in the commercial application of manhole rehabilitation under the Contractor’s license is required.

B. Engage experienced applicator to perform Work of this Section who has specialized training in installing materials required for this Project; who is approved, authorized, or licensed by coating system Manufacturer to install Manufacturer's product; and who is eligible to receive the standard Manufacturer's warranty. A minimum of three (3) years of active continuous experience in the commercial application of manhole rehabilitation under the Contractor’s license is required.

1.5 REFERENCES

A. ACI 305R - Hot Weather Concreting.

B. ASTM C 579 – Compressive Strength Hydraulic Cement Mortars

C. ASTM C 78 - Flexural Strength of Concrete (Using Simple Beam With Third-Point Loading)

D. ASTM C 109 - Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)

E. ASTM C 157 - Length Change of Hardened Hydraulic-Cement Mortar and Concrete

F. ASTM C 876 - Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete

G. ASTM D 4138 - Measurement of Dry Film Thickness of Protective Coating Systems by Destructive Means

H. International Concrete Repair Institute (ICRI) Technical Guideline No. 03730 – Surface Preparation Guidelines for the Repair of Deteriorated Concrete Resulting From Reinforcing Steel Corrosion

1.6 SUBMITTALS

A. Furnish the following Qualifications Statement submittal with bid:

1. Submit manhole rehabilitation company history stating years in service

2. Submit evidence of factory authorization or licensing by Manufacturer of manhole rehabilitation system to install product.

3. Submit documentation of employees' cognizance and ability to comply with all Federal and State OSHA regulations regarding confined space entry.

B. Furnish the following submittals.

1. Submit Manufacturer's product catalog data including physical properties.

2. Submit application instruction requirements.

3. Submit coating system and application certification per certificate of compliance requirements.

4. Submit material samples.

5. Submit qualifications of applicator(s).

1.7 DELIVERY, STORAGE AND HANDLING

A. Manufacturer's instruction and warranty requirements for delivery, storage and handling of concrete restoration and coating systems shall be strictly followed.

PART 2 PRODUCTS

2.1 MATERIALS

A. Coating system shall be a corrosion barrier geopolymer mortar.

B. Corrosion Barrier Geopolymer Mortar

1. Manufacturer: Quadex GeoKrete or approved equal.

2. Minimum physical and chemical resistant properties:

a. Compressive Strength (ASTM C39 & C109): 28 Days - 8,000 psi

b. Flexural Strength (ASTM C78): 28 Days – 800 psi

c. Bond Strength (ASTM C882): 28 Days – 3,000 psi

d. Chemical Resistance (ASTM C267): Not to exceed 0% mass loss in 12 weeks

e. Permeability (AASHTO T-277): Not to exceed 300 coulombs

f. Freeze Thaw (ASTM C666): No visible damage after 300 cycles

g. Material Wet Density: Minimum 127 +/-5 pcf

C. Infiltration control material

1. Where required, grout sealing is a temporary measure to be used for the purpose of stopping any active infiltration for the duration of the manhole rehabilitation installation. Any manhole with active infiltration shall be grout sealed by injection of grout from the inside of the structure prior to installation of any rehabilitation materials. There shall be no active infiltration present in a manhole during the application and curing of any rehabilitation material applied to the interior surfaces of the manhole structure. The Contractor shall identify all active infiltration and stop this infiltration with a suitable grout sealing material.

2. The grout installation method and grout type used to stop all active infiltration during application and curing of the manhole rehabilitation materials are the responsibility of the Contractor.

PART 3 EXECUTION

3.1 PREPERATION:

A. Before using product, investigate its compatibility with surfaces, fillers, and joints sealants.

B. Use only compatible materials

C. Clean cracked or soft area with wire brush.

D. Interior surface preparation of manholes shall proceed as follows:

1. Cut and cap pipe protrusions as directed by the District.

2. Water blast manhole interior to remove deteriorated concrete, oil, grease, or existing coating. Water blast equipment shall use a minimum pressure of 3,500 psi and shall not use detergent or other chemical cleaning solvents.

3. Inspect cleaned surfaces to identify and mark corroded reinforcing steel, and to locate cracks, leaks and joints.

4. Remove all debris prior to coating. Do not allow debris to enter sewer system.

5. Prepare surfaces to have a minimum profile of 1/16 inch profile, preferably with aggregate exposed.

6. Prior to installation, repair all irregularities, voids, and deteriorated surfaces to a uniform and sound surface using rap-id setting repair mortar compatible with lining system.

7. Saturate all surfaces thoroughly with potable water.

8. Apply restoration mortar as soon as water sheen is no longer visible.

9. Return manhole channel and shelf areas to original dimensions using concrete repair mortar. Hand trowel shelves to provide smooth and uniform surface. Allow concrete to cure prior to coating.

3.2 APPLICATION OF GEOPOLYMER LINER

A. Furnish and install materials at locations shown on Plans and Submittals.

B. Mix and apply material in accordance with manufacturer's instructions to proper consistency.

C. Material shall be applied when no visible water is dripping or running.

D. Material shall not be applied during freezing weather conditions.

E. Material shall not be applied when the ambient temperature is 37°F and falling or when the temperature is anticipated to fall below 32°F within 24 hours.

F. Hand Spray Application:

1. Material hose shall be coupled to a low-velocity spray application nozzle. Pumping of the material shall commence and the mortar shall be atomized by the introduction of air at the nozzle, creating a low-velocity spray pattern for material application.

2. Spraying shall be performed by starting at the bottom of the structure and progressing up the wall.

3. Material shall be applied to a minimum thickness of one (1) inch. Material shall be applied to the bench area in such a manner as to provide for proper drainage without ponding and accounting for anticipated abrasion.

4. Troweling of materials shall begin immediately following the spray application. Initial troweling shall be in a motion, to compress the material into any voids within the structure walls. Precautions shall be taken not to over trowel.

5. Once troweling has been completed the applied liner shall be brushed to remove trowel marks and to break up the latent surface brought about by troweling. Brushing shall be in the horizontal plane and as with troweling do not over work the lining material.

G. Centrifugal Application:

1. Spin-cast unit shall be approved by the material manufacturer. Motor torque and application process shall be sufficient to evenly apply lining materials within an 8-foot diameter or smaller structure. Robotic insertion/extraction equipment and speeds shall be calibrated to the structure diameter to ensure uniform application to

specified thickness. Material hose shall be coupled to the spin-cast unit. The spin-cast unit shall then be positioned within the center of the structure.

2. Initially locate the spinner at either the top of the manhole chimney or the lowest point corresponding to the junction of the manhole bench and walls. The spin-cast unit shall then be initialized, and pumping of the material shall commence. As the mortar begins to be centrifugally cast evenly around the interior of the structure, the rotating applicator head shall be cycled up and down in rough, non-uniform vertical structures at a controlled retrieval speed conducive to providing a uniform material thickness on the structure walls.

3.3 APPLICATION OF RESTORATION MORTAR

A. Furnish and install materials at locations shown on Plans and Submittals.

B. Apply restoration mortar in accordance with manufacturer's instructions.

C. Apply uniformly to substrate to the specified thickness. Do not apply to manhole frame.

D. Do not trap air in corners, behind exposed reinforcing steel, or between lifts.

E. Mortar Thickness: Apply a minimum thickness of 1/2 inch above peaks of existing profile after surface preparation.

F. Finish surface with wood float, sponge float, broom, or brush to produce a textured surface upon which to apply Corrosion Barrier Mortar.

G. Follow manufacturer’s instruction for hot or cold weather application.

3.4 CURING

A. Manhole shall be isolated from sunlight and dry outside air as soon as possible but no more than 10 minutes after troweling is complete to minimize moisture loss in the material. Contractor shall place a cover sheet of plastic sheeting between manhole frame and cover or tunnel/pipe terminations to prevent moisture loss. Applications shall not occur in direct sunlight. When low or no flow conditions exist within the manhole, place plastic sheeting underneath the lid/cover.

3.5 FIELD QUALITY CONTROL

A. Field testing shall include the following:

1. Inspection of Interior Surface Preparation – A visual inspection of the manhole surface following the interior surface preparation shall be performed by the Engineer before receiving the finish coat. Engineer shall be notified two days in advance of the inspection.

2. Thickness Testing – During application, a dry film thickness test shall be used to ensure uniform thickness during application. Contractor shall perform the test and shall submit documented thickness readings to the Engineer. Any area that does not meet the specified thickness shall receive additional coating at the Contractor’s expense.

3. Installation, Leakage and Field Performance Test – A visual inspection by the Engineer of the finished installation shall be performed to demonstrate compliance to these Contract Documents and Manufacturer's printed literature.

4. Holiday Testing – After the protective coating has set hard to the touch it shall be inspected with high voltage holiday detection equipment such as Tinker and Rasor APW or equivalent specified by coating Manufacturer. Perform spark testing upon completion of the visual inspection and in the presence of the Engineer. Spark testing voltage will be set at 100 volts per mil of coating thickness specified. All detected holidays shall be marked and repaired following the manufacturer's recommendations and shall be performed at no cost to the District. Complete additional spark testing after all repairs have been completed, reinspected and approved.

5. Vacuum Testing - Manholes with flows low enough to halt the flow long enough for a vacuum test shall be vacuum tested. All pipes entering the manhole must be sound (not cracked) and shall be plugged, taking care to securely place the plug from being drawn into the manhole. Lined mains must have pipe seal preventing leaks in annular space with original pipe. A vacuum pump apparatus shall be placed onto the manhole ring and sealed to the structure in accordance with the pump manufacturers' recommendations. A vacuum pump of ten (10) inches of mercury shall be drawn and the vacuum pump shut off. With the pressure relief valves closed, the time shall be measured for the vacuum to drop to (9) inches. Minimum allowable test times (seconds) for 48" diameter manhole acceptance at the specified vacuum drop shall be as follows:

Manhole Depth (feet)	Test Time (seconds)
4	10
8	20
12	30
16	40
20	50
24	60

6. Adhesion Testing – Affix one 3/4-inch dolly to lined surface at upper cone section, midsection and bottom. Adhesive used to attach dollies to liner shall be rapid setting with tensile strength in excess of liner material and permitted to cure in accordance with Manufacturer's specifications. Prior to pull test, tester shall use scoring device to cut through coating until substrate is reached. Failure due to improper dolly adhesive or scoring will require retesting at no additional cost to Owner. Pull tests in each area shall exceed 200 psi and include substrate adhered to back of dolly or leave no visual signs of coating material in test hole. Pull tests with results between 150 psi and 200 psi may be acceptable if more than 50% of substrate adhered to back of dolly. If any tests fail, test at least 3 additional locations in the section of the failure, as directed by Engineer. If any of retests fail, remove entire liner and replace at the Contractor's expense. If host structure fails adhesion test, one additional host structure shall be tested as directed by Engineer.

END OF SECTION

SECTION 33 14 00

WATER PIPING SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Water Piping
2. Unions and Flanges
3. Joints
4. Dismantling Joints
5. Couplings
6. Restrained Flanged Adaptor
7. Non-Restrained Flange Adaptor
8. Tapping Sleeves and Tapping Valves
9. Service Saddles
10. Dielectric Couplers
11. Bedding and Cover Materials
12. Underground Tracer Wire
13. Detectable Pipe Locating Tape
14. Water Main Line Monument
15. Pipe Supports, Brackets and Stem Guides
16. Flange Insulation Kit
17. Pipe Casing
18. Hydrostatic and Leakage Test
19. Disinfection
20. Bacteriological Testing

B. Related Sections

1. Section 01 30 00 – Administrative Requirements

2. Section 01 33 00 – Submittal Procedures

3. Section 01 40 00 – Quality Requirements

4. Section 01 60 00 – Product Requirements

5. Section 31 23 19 – Dewatering

6. Section 31 23 30 – Shoring and Trench Safety

7. Section 31 23 33 – Trenching and Backfilling

8. Section 33 01 10 – Disinfection of Water Utility Distribution

9. Section 33 14 19 – Valves and Appurtenances

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for the items in this section shall be included in the bid item to which it relates. No additional measurement or payment shall be made for the requirements of this section.

1.3 REFERENCES

A. American Public Works Association (APWA)

1. Uniform Color Code for Marking of Underground Utility Locations.

B. American Society of Testing and Materials (ASTM)

1. ANSI/ASME B1.20.1 – Pipe Threads, General Purpose.

2. ANSI/ASME B16.1 – Cast-Iron Pipe Flanges and Flanged Fittings.

3. ANSI/ASME B16.5 – Pipe Flanges and Flanged Fittings.

4. ASTM A126 - 04 Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

5. ASTM A536 - Standard Specification for Ductile Iron Castings.

6. ASTM C150 - Standard Specification for Portland Cement.

7. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120.

8. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).

9. ASTM D3139 - Standard Specifications for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

10. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

11. ASTM F1674-96 – Thrust Restrained Devices

C. American Water Works Association

1. ANSI/AWWA C104/A21.4 – American National Standard for Cement–Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

2. ANSI/AWWA C105 – Polyethylene Encasement for Ductile – Iron Pipe Systems.ANSI/AWWA C110/A21.10 – American National Standards for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. for Water and other Liquids.

3. ANSI/AWWA C110 – Fittings.

4. ANSI/AWWA C111/A21.11 – American National Standards for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

5. ANSI/AWWA C115 – Flanged Ductile Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges.

6. ANSI/AWWA C116 – Standard for Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings.

7. ANSI/AWWA C151/A21.51 – American National Standards for Ductile-Iron Pipe, Centrifugally Cast, for Water.

8. AWWA C153 – Standard for Ductile-Iron Compact Fittings for Water Service.

9. AWWA C220 – Stainless Steel Piping

10. AWWA C226 – Stainless Steel Fittings

11. AWWA C2BB – Stainless Steel Flanges

12. ANSI/AWWA C600 – American National Standards for Installation of Ductile Iron Water Mains and their Appurtenances.

13. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.

14. ANSI/AWWA C651 – American National Standards for Disinfecting Water Mains.

15. AWWA C900 - AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Transmission and Distribution.

16. AWWA C905 - Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 48 In. (350 mm Through 1,200 mm), for Water Transmission and Distribution.

17. AWWA M9 – Concrete

18. AWWA M23 – PVC Pipe-Design and Installation

D. California Waterworks Standards

E. ANSI/NSF- American National Standards Institute/ National Sanitary Federation

1. Standard 61 – Drinking Water System Components – Health Effects

1.4 SUBMITTALS

A. Section 01 33 00 – Submittal Procedures

B. Shop Drawings: Indicate piping layout at connections, if different than shown on plans.

C. Product Data: Submit data on pipe materials, fittings, and accessories.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

E. Manufacturer’s Recommendation: Submit four copies of Manufacturer’s current recommended method of installation

F. Submit detailed written procedures outlining the methods, tools, and protective equipment to be used and required training and certifications (if any) for all work associated with asbestos cement pipe.

G. Pressure Testing Plan.

H. Disinfection and Chlorinated Water Disposal Plan.

I. Connection transfer plan and schedule for all connections and final tie-ins.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 – Execution Requirements: Requirements for submittals.

B. Project Record Documents:

1. Record actual horizontal and vertical locations of piping mains, valves, connections, thrust restraints, and invert elevations.

2. Identify and describe on the Record Drawings unexpected variations due to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with specified standards.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 – Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the installed Work and materials of all other trades.

C. The Contractor shall provide and use proper equipment, tools, and facilities for the safe and proper handling and protection of the pipe. Pipe shall be handled in such a manner as to avoid damage to the pipe material or any coating and especially to the ends. All equipment and

small loose pieces, tools, gaskets, etc. shall be adequately packed to prevent damage or loss during shipment or while in storage.

D. In the event of damage, immediately make all replacements necessary at no additional cost to the District.

E. When damaged pipe cannot be repaired to the satisfaction of the Engineer, it shall be removed from the job.

F. Pipe shall be stored in a safe location, protected from the elements where damage or contamination therefrom could result.

G. The pipe shall be carefully lowered in the trench to prevent damage. Under no circumstances shall pipe be dropped or dumped into trenches. Remove foreign matter and dirt from the inside of the pipe and keep it clean during and after laying.

H. The Contractor shall take care to keep from damaging the pipe by heavy loads and unnecessary compactive effort, especially for shallow lifts. All damaged pipe shall be replaced. Repairs will not be acceptable.

PART 2 PRODUCTS

2.1 GENERAL

A. All materials shall conform to sizes, capacity, quality, and quantities as shown on the Drawings or described in these Specifications. Materials shall be from new stock, delivered in good condition. No damaged stock shall be used.

B. Where no method of tests for materials is specified, the latest applicable test specified by ASTM shall be followed.

C. After delivery to the site, all materials shall be carefully unloaded, protected against breakage, rusting, accumulation of foreign matter, disintegration, and injury. The Contractor shall be responsible for all lost or damaged material supplied and Work done under this Contract.

2.2 WATER PIPING

A. Ductile Iron Pipe:

1. AWWA C151 and shall be Cast Iron O.D.

2. Ductile iron fittings shall have a minimum rated working pressure of 250 psi.

3. Exterior Pipe Coating: Bituminous coating: AWWA C151.

4. Buried Exterior Pipe Protection: 8-mil Polyethylene Film: AWWA C105/ANSI A21.5.

5. Interior Pipe Lining: Cement-Mortar: Type V, AWWA C104.

B. Ductile Iron Fittings: AWWA C110 ductile iron, standard thickness.

1. Coating and Lining:

a. Bituminous Coating: AWWA C110/ANSI A21.51.

b. Cement Mortar Lining: AWWA C104.

c. Buried Exterior Pipe Protection: 8-mil Polyethylene Film: AWWA C105/ANSI A21.5.

2. Joints:

a. Mechanical and Push-On Joints: AWWA C111.

b. Flanged Joints: AWWA C110, ASME B16.1, ANSI B16.1 Class 125 flat faced.

c. Restrained Joints: Refer to Part 2.3.

d. Gaskets: Conforming to ANSI A21.11. Gaskets for flanged joints shall be 1/8-in thick, cloth inserted rubber, full faced with holes to pass bolts.

e. Bolts: Bolts and nuts shall be low alloy steel ASTM A193. The alloy composition shall be such that the bolts are cathodic to the coupling. Washers of the same material shall be supplied.

C. Pipe Polyvinyl Chloride (PVC) Pipe:

1. Polyvinyl Chloride (PVC) Pipe for sizes 4” through 12”: Class 150 (DR 18) as per ASTM D1784, manufactured in accordance with AWWA C900, and shall be Cast Iron O.D.

2. Polyvinyl Chloride (PVC) Pipe 14”: Class 165 (DR 25) as per ASTM D1784, manufactured in accordance with AWWA C905, and shall be Cast Iron O.D.

D. Polyethylene (PE) Pressure Piping and Tubing:

1. Polyethylene (PE) pressure piping and tubing ¾-inch through 3-inch for water service as per ANSI/AWWA C901-17, manufactured per ASTM D2239 and D2737 with fittings per ASTM D3350

2. PE 3408 pressure piping and tubing ¾-inch through 3-inch for water service per ASTM D-3035.

E. Ductile Iron Fittings:

1. Provide restrained ductile iron fittings as shown on plans.

2. Ductile iron fittings shall have a minimum rated working pressure of 250 psi. The fittings shall have a bell ends with gaskets specifically designed for a cast iron equivalent outside diameter PVC pipe, or mechanical joint type fittings manufactured specifically for PVC Pipe.

3. Provide Class 250 flanges on ductile iron fittings where mating to Class 250 butterfly valves.

4. Bolts for PVC pipe, where required, shall be 3 lb stainless steel, ASTM A193, Grade B 8M hex head with ASTM A194, Grade B 8M hex nuts. Washers of the same material shall be supplied.

5. Provide ductile iron tapped tees for appurtenance outlets 2-1/2 inches and smaller. Tapped tees shall be constructed of ductile iron, have outlet iron threads, and bell ends designed to fit the type, size and class of pipe.

6. Provide ductile iron tees with a flanged outlet for appurtenance outlets 3 inches and larger.

F. PVC Joints: ASTM D3139 and ASTM F477 PVC flexible elastomeric seals. Solvent-cement couplings are not permitted except for pipes 2-inches in diameter and smaller.

1. All joints shall be integral, bell and spigot gasketed joints, or plain end with rubber ring couplings.

2. When the spigot end of pipe is to be inserted into a mechanical joint fitting, the beveled end of the pipe shall be removed prior to insertion.

3. Solvent weld joint are not permitted.

G. Stainless Steel Pipe: AWWA C220 Type 304L Stainless Steel Schedule 40 (0.322” thick) meeting EPA and ANSI/ NSF 61.

1. Flanges: AWWA C2BB

2. 125lb Flange

3. Unions:

2.3 . RESTRAINED AND MECHANICAL JOINTS

A. Manufacturer:

1. For PVC Pipe:

a. Mechanical Joint Fittings: EBAA Iron, Inc., Series 2000PV or equivalent.

2. For Ductile Iron Pipe:

a. Push-On Joint Restrained: EBAA Iron, Inc., Series 1700 or equivalent.

b. Mechanical Joint Fittings: EBAA Iron, Inc., Series 1100 or equivalent.

3. For asbestos cement pipe (ACP):

a. JCM 630 fitting restrainer and 631 coupling restrainer

4. Substitutions: Section 01 60 00 - Product Requirements.

B. Materials: Ductile Iron, ASTM A536.

C. Coating: MEGA-BOND, or approved equivalent.

D. Style: split ring used behind the pipe bell and a serrated ring used to connect the bell ring and the gripping ring.

E. Pressure rating: 200 psi minimum.

2.4 COUPLINGS

A. Manufacturer

1. For Restrained Coupling

a. EBAA Iron, Inc.: Series 3800 MEGA-COUPLING or equivalent

b. Substitutions: Section 01 60 00 - Product Requirements.

B. Materials:

1. Body - Ductile Iron; ASTM A536

2. Bolts: Stainless Steel

C. Pressure rating: meet or exceed adjacent piping system rating.

D. System compatible with connecting pipe; verify connecting pipe O.D.

2.5 RESTRAINED FLANGE ADAPTOR

A. Manufacturer: EBAA Iron, Inc., Series 2100 or equivalent.

1. Substitutions: Section 01 60 00 - Product Requirements.

B. System: restrain plain end of pipe to a flange, conforming to AWWA C110.

C. Materials:

1. Body: Ductile Iron; ASTM A536

2. Bolts: Stainless Steel

D. Coating: AWWA C550; interior/exterior.

E. Pressure rating: meet or exceed adjacent piping system rating.

F. System compatible with connecting pipe; verify connecting pipe O.D.

2.6 NON-RESTRAINED FLANGE ADAPTOR

A. Manufacturer: Baker Series 220 Coupling or equivalent

1. Substitutions: Section 01 60 00 - Product Requirements.

B. Pressure rating: meet or exceed adjacent piping system rating.

C. System compatible with connecting pipe; verify connecting pipe O.D.

D. Submit shop drawings for each coupling as indicated on the Contract Drawings.

2.7 TAPPING SLEEVES AND TAPPING VALVES

A. Tapping Sleeves:

1. Manufacturers:

a. JCM Industries or equivalent

b. Mueller Co or equivalent.

c. Smith-Blair, Inc or equivalent

2. Epoxy-coated ductile iron construction.

3. O-ring seals on outlet and flange connection.

4. Substitutions: Section 01 60 00 - Product Requirements.

5. Description: Ductile iron or cast-iron dual compression type.

6. Outlet Flange Dimensions and Drilling: ASME B16.1, Class 125 and MSS SP-60.

B. Tapping Valves:

1. Manufacturers:

a. Mueller Company or equivalent

b. U.S. Pipe or equivalent

2. Substitutions: Section 01 60 00 - Product Requirements.

3. Refer to Section 33 14 19 – Valves and Appurtenances

2.8 SERVICE SADDLES

A. Manufacturers:

1. Smith-Blair Series 317, 357, or 397 or equivalent

2. Romac Style 101N, 202NS, 101 BS or equivalent

3. Mueller DR2A series or equivalent

4. Substitutions: Section 01 60 00 - Product Requirements.

B. Materials:

1. Double strap type, with bodies cast of either stainless steel, epoxy-coated ductile iron, or bronze, designed to hold pressures in excess pipe working pressure.

2. Taps shall have Iron Pipe threads.

3. Service saddles shall be equipped with nylon bushings where connecting to dissimilar metals.

2.9 DIELECTRIC COUPLERS

A. Manufacturers:

1. Smith-Blair Series 317, 357, or 397 or equivalent

2. Romac Style 101N, 202N, 101 BS or equivalent

3. Mueller DR2A series or equivalent

4. Substitutions: Section 01 60 00 - Product Requirements.

2.10 BEDDING AND COVER MATERIALS

A. Per Specification 31 05 13 – Aggregates for Earthwork.

2.11 UNDERGROUND TRACER WIRE

A. Underground tracer wire shall be #10 AWG THWN - Thermoplastic Heat and Water-Resistant Nylon Coated - copper wire, with yellow insulation

2.12 DETECTABLE PIPE LOCATING TAPE

A. Detectable pipe locating tape shall consist of solid aluminum foil encased in a protective high-visibility, inert polyethylene plastic jacket. Foil is to be visible on the unprinted side. Minimum overall thickness shall be 5.5 mils. Tape width shall be SIX (6) inches. Tape color and lettering shall be in accordance with the APWA Uniform Color Code for Marking of Underground Utility Locations. The identifying lettering shall be a minimum of one (1)-inch-high permanent black lettering imprinted continuously over the entire length. The tape shall be Terra “D” as manufactured by Reef Industries, Allen Detectable, or approved equal.

B. After the trench is backfilled to within 18 inches of the finished grade the Contractor shall install a detectable pipe locating tape over all water mains. The backfill shall be sufficiently leveled so that the tape will be installed on a flat surface. The tape shall be centered in the trench and laid flat with printed side up. Caution shall be exercised to avoid displacement and to ensure its integrity.

2.13 PIPE SUPPORTS, BRACKETS AND STEM GUIDES

A. Manufacturer:

1. Cooper B-Line, Inc.

2. Waterman.

3. Substitutions: Section 01 60 00 - Product Requirements.

B. Components:

1. Pipe Supports: Provide pipe support with saddle, U-bolt, gusset, pipe adjuster, base stand, expansion anchor bolts, and all other required installation hardware.

2. Brackets and Stem Guides: Provide brackets, stem guides, supports, bolts pipe clamps, and all other required installation hardware.

2.14 PIPE STRAPS

A. Manufacturer:

1. Gibson Stainless & Specialty Inc.

a. 2” Pipe Straps Model #3200-2

b. 3” Pipe Straps Model #3300-2

c. 4” Pipe Straps Model #3300-2

2. Cooper, B-Line

a. Figure B3180FL – Flush Mount Pipe Strap

3. Substitutions: Section 01 60 00 - Product Requirements.

B. Material: 316 stainless steel per ASTM 167.

C. Bolts: 316 Stainless steel

2.15 FLANGE INSULATION KITS

A. The Contractor shall provide a flange insulation kit for flanged connections between pipes of dissimilar materials. Flange insulation kits shall be of the full face gasketed type for use with domestic water.

B. Manufacturer:

1. Calpico, Inc.

2. Substitutions: Section 01 60 00 - Product Requirements.

PART 3 TESTING

3.1 GENERAL

A. Scope. All water pipe and appurtenances shall be hydrostatically tested for below grade piping systems for pipe material structural integrity and leaks.

3.2 HYDROSTATIC AND LEAKAGE TEST

A. Prior to acceptance of the Work by the District, the Contractor shall perform pressure testing on potable water distribution systems in accordance with AWWA C600/ C605.

B. Test Fluid. The test fluid is to be District distribution system potable water. The Contractor shall be responsible for providing all connections, piping, fittings, etc. for conveying test water from the District’s existing potable water system to the point of usage, and also for proper disposal, as required, of water used in the testing operations. All costs associated with supply and disposal of test water shall be at the Contractor’s expense.

No final direct connection to the existing sterile water system shall be made until satisfactory completion of all testing (i.e., hydrostatic testing, chlorination, and bacteriological testing). The Contractor shall install temporary jumper pipe assemblies and temporary blowoffs to facilitate testing of the pipeline in segments as needed. The temporary facilities shall be removed by the Contractor prior to making the connections. The Contractor is responsible for all final closures and connections.

C. Test Equipment

1. Water: Sufficient quantity to fill pipeline section under test. Contractor shall arrange with the District for locations for acquiring potable water for testing. Contractor shall be responsible for all temporary piping, fittings, meters, and appurtenances.

2. Valves: Suitable to isolate pipeline section under test without leaking.

3. Relief Valve: To permit pressure relief if pressure exceeds 20 to 25 percent above the required test pressure to prevent pipeline failure

4. Pressure Gauge(s): Provide sufficient number of pressure gauges capable of measuring pressure 50 percent over the intended test pressure. Location of the gauges shall be determined by the Contractor and submitted with the pressure test plan. Contractor shall furnish all necessary equipment and make all taps in pipe required to perform testing.

5. Pressure gauges and relief valves shall be checked for accuracy before being used during actual testing of the pipeline.

D. Preparation for Test

1. Contractor shall notify Engineer a minimum of three (3) working days prior to performance of testing. Engineer shall monitor all tests.

2. Contractor shall temporarily isolate the piping system into segments for testing purposes. Expansion joints shall be isolated, temporarily restrained, or removed prior to start of the test.

3. Contractor shall confirm that the pipeline is properly backfilled up to a minimum of the primary backfill levels and that all required thrust blocks and/or in-line restraints are in place prior to start of the pressure test.

4. Connect booster pump and provide temporary closures for all the external openings in the system. Use caution to ensure that the closures are properly designed and strong enough to withstand the test pressure.

5. Tighten any flange connections loosened to vent air before applying test pressure.

6. Permit the test fluid and the pipeline to set undisturbed for a minimum of 24 hours to achieve temperature equilibrium.

E. Test Pressure: The working pressure shall be assumed to be 80 psi. Test pressure shall be at least 150 percent of the working pressure (120 psi) at point of the test, and no less than 125 percent of normal working pressure (100 psi) at the highest elevation.

F. Test Duration: The hydrostatic and leakage test duration shall be two (2) hours.

G. Test Procedure

1. The test procedures described herein shall be performed for each of the designated pipeline segments.

2. Completely fill pipeline to be tested with water. The maximum rate of filling shall be limited so that the fluid filling the pipeline produces a maximum flow velocity of one (1) foot per second.

3. Completely bleed off all trapped air during filling.

4. Close all vents used to vent air from the pipe and restrict access in the test area to only those required for the test.

5. During the initial expansion phase, slowly raise the pressure utilizing the booster pump until the desired test pressure is achieved.

6. Add sufficient make-up test fluid to the system, at one-hour intervals for two hours, to maintain the system test pressure. The pipe should have obtained equilibrium.

7. Turn off the booster pump and hold the final test pressure for the required test duration period.

8. At the end of the test period add sufficient make-up water to return the pipe to the required test pressure. Record the value of make-up water required to return to test pressure. If the test pressure is not returned within the allowable volume of water as indicated by the equation below, the test fails.

9. The testing allowance shall be defined as the quantity of water that must be supplied to the pipe section being tested to maintain a pressure within 5 psi of the specified hydrostatic test pressure. No installation will be accepted if the quantity of makeup water is greater than that determined by the following formula:

$$Q = \frac{LD\sqrt{P}}{148{,}000}$$

Where Q is quantity of makeup water (gallons per hour), L is the length of pipe being tested (ft), D is the nominal diameter of the pipe (inches), and P is the average test pressure during the hydrostatic test (psi gauge).

The allowances only apply to the test period and not to the initial expansion phase.

10. Total test time shall not exceed eight (8) hours at the required test pressure. If the test is not completed due to leakage, equipment failure, etc. the test pressure shall be relieved and the test section shall be allowed to “relax” for a minimum of eight (8) hours before another test can be attempted.

H. Flushing

1. Lines tested with water shall be completely drained.

2. Pipelines tested shall be flushed after the test and draining is complete.

3. All water drained from pipelines shall be dechlorinated and disposed of per Section 33 01 10 – Disinfection of Water Utility Distribution.

I. Test Records

1. Records shall be maintained of all tests performed.

2. Test records shall include at a minimum:

    a. Date and time of beginning and end of pipeline testing

    b. Identification of pipeline being tested

    c. Test Fluid

    d. Test Pressure

    e. Ambient temperature

    f. Pressure gauge reading taken during the test

    g. Quantities of make-up water added during the test

    h. Signatures of Test Technician, Contractor representative who witnessed the test and the District representative who witnessed the test

J. When tests indicate Work does not meet specified requirements, remove Work, replace and retest at the Contractor's expense.

3.3 BACTERIOLOGICAL TESTING

A. Refer to Section 33 01 10 – Disinfection of Water Utility Distribution.

PART 4 DISINFECTION

4.1 DISINFECTION

A. Refer to Specification 33 01 10 - Disinfection of Water Utility Distribution.

END OF SECTION

SECTION 33 14 19

VALVES AND APPURTENANCES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plug Valves
2. Gate Valves
3. Butterfly Valves
4. Combination Vacuum and Air Relief Valves

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for the items in this section shall be included in the Bid Item to which they relate. No additional measurement or payment shall be made for the requirements of this section.

1.3 RELATED SECTIONS

Related work specified in other sections:

A. Section 31 23 16 – Excavation

B. Section 33 01 10 – Disinfection of Water Utility Distribution

C. Section 33 14 00 – Water Piping Systems

1.4 REFERENCED CODES AND SPECIFICATIONS

The following standards apply:

A. The American National Standards Institute/National Sanitary Federation (ANSI/NSF-61)

B. The American Society for Testing and Materials (ASTM)

1. A 126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
2. A 536 - Standard Specification for Ductile Iron Castings

C. American Water Works Association Inc. (AWWA):

1. C210 - Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water pipelines
2. C504 - Rubber-Seated Butterfly Valves
3. C509 - Resilient-Seated Gate Valves for Water Supply Service
4. C517 - Resilient-Seated Cast Iron Eccentric Plug Valves.
5. C550 - Protective Epoxy Interior Coatings for Valves and Hydrants

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal requirements.

B. Shop drawings: Submit complete shop drawings including layouts, elevations, and details to the Engineer.

C. Material list: Submit with the shop drawings a complete list of all materials and equipment catalog number, and catalog cuts for each item where applicable.

D. Valve Data: Submit the following

1. Valve dimensional assembly drawings
2. Valve cross section drawings.
3. Head loss, Cv, and calculated port area.
4. Provide valve torque seating, un-seating, and dynamic torque at 10-degree increments.
5. Test certifications, Seat leakage, Hydro-static, coating thickness.

E. Operations and Maintenance Manuals: Submit copies of the manufacturer’s current operation and maintenance manuals.

F. Manufacturer's recommendations: Accompanying the materials list and shop drawings, submit copies of the manufacturers' current recommended method of installation.

G. Coating Data: with applied coating thickness.

1.6 DESIGN REQUIREMENTS AND OPERATING CONDITIONS

A. Valve Working Pressure:

1. Minimum 150 psi unless otherwise specified or shown.

B. Product Handling:

1. Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.

2. The Contractor shall provide and use proper implements, tools and facilities for the safe and proper handling and protection of the material.

3. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer, and at no additional cost to the District.

4. When damaged material cannot be repaired to the satisfaction of the Engineer, it shall be removed from the job and replaced at no cost to the Owner.

5. Material shall be stored in a safe location, protected from the elements where damage could result.

1.7 QUALIFICATIONS/RESPONSIBILITY/SAFETY

A. Qualifications of manufacturers:

1. The material shall be the product of a supplier regularly engaged in the manufacturing of pipe and plumbing products.

2. All materials shall be new and of current manufacture and shall be guaranteed against defects of workmanship in accordance with Part B-1 of the General Conditions.

B. Qualification of installers:

1. For the actual assembly, installation, and testing of the work of this section, use only thoroughly trained and experienced personnel who are completely familiar with the requirements for this work and with the installation recommendations of the manufacturers of the specified items.

PART 2 PRODUCTS

2.1 GENERAL

A. All materials shall conform to sizes, capacity, quality, and quantities as shown on the Plans or described in these Specifications. Materials shall be from new stock and delivered in good condition; no damaged stock shall be used.

B. Where no method of tests for materials is specified, the latest test specified by ASTM shall be followed.

C. After delivery to the site, all materials shall be carefully unloaded, protected against breakage, rusting, accumulation of foreign matter, disintegration, and injury. The Contractor shall be responsible for all lost or damaged material supplied and work done under this Contract.

2.2 BOLTS, GASKETS, GLANDS, NUTS

A. Bolts, gaskets, glands, nuts, and miscellaneous accessories required to install all valves shall be furnished. All exposed nuts and bolts shall be 316 stainless steel. Gaskets for flanged connections shall be suitable for the pressure, temperature, and chemical characteristics of

the fluid handled. The gasket materials shall also be suitable for the pipe system physical characteristics and materials and shall conform to NSF-61 requirements. Gaskets shall extend from the inside diameter of the flange to at least the inside edge of the bolt holes or they may extend beyond the bolt circle.

B. Dissimilar Materials – Provide dielectric bolts and NBR gaskets where flanges of dissimilar materials are joined

2.3 RESILIENT – WEDGE GATE VALVES

A. Manufacturer:

1. Mueller Company
2. Clow Eddy - Iowa
3. U.S. Pipe
4. Substitutions: Section 01 60 00 - Product Requirements.

B. Ductile-iron body in accordance with AWWA C509 and C515 except as modified herein.

C. Each valve shall have a smooth unobstructed waterway free from any sediment pockets.

D. Gate valves shall be leak-tight at their rated pressure.

E. Gate valves shall have a non-rising low-zinc bronze or stainless steel stem, opened by turning left (counterclockwise).

F. Stem: Non-Rising

G. Stem seals shall be the O-ring type incorporating a minimum of two rings as required by AWWA C509.

H. Low-friction torque-reduction thrust washers or bearings shall be provided on the stem collar.

I. Wedge (gate) shall be fully encapsulated with a bonded-in-place Nitrile elastomer covering. Minimum thickness of the rubber seating area shall be 6.35mm (1⁄4").

J. Interior and exterior surfaces (except for the encapsulated disc) shall be coated as described below in Section 2.6.

K. All bolts and nuts used in the construction of gate valves shall be Type 316 stainless steel.

L. Operating nut shall be of size to accommodate the District's standard operating tool which has an inside dimension of 2-1/8 x 2-1/8 x 2-1/8 inch deep socket. Stem shall turn counterclockwise to open.

2.4 BUTTERFLY VALVES

A. Manufacturer: Butterfly valves, butterfly valve operators, and component parts as manufactured by one of the following:

1. Henry Pratt, Model:
    a. 2FII Groundhog Butterfly 3” – 20”
    b. Triton > 24”
2. Mueller
3. Millikan Valve
4. Substitutions: Section 01 60 00 - Product Requirements.

B. Performance requirements:

1. Isolation valve, which shall provide drip-tight shutoff to the full valve rating on the dead end or isolation service without a downstream flange.
2. Maximum Velocity: 16 ft/s.
3. Duty: Open/Close
4. Permanently self-lubricating body bushings shall be provided and shall be sized to withstand bearing loads. Stuffing box of liberal dimensions shall be provided at the operator end of the vane shaft. Packing shall be of the self-compensating type. A sealing element utilizing O-rings shall also be acceptable. Packing shall be held in place by a bolted corrosion resistant retainer plate or gland; retainer clips are not acceptable. Replacement of seals shall not require removal of the valve from the line.

C. Valve: AWWA C-504; fusion bonded epoxy coated cast iron.

D. Resilient seat: Buna-N; molded in-body with integral shaft seal.

E. Ends & Body: flanged; Class 150B per ANSI B16.1 and short bodied.

F. Valve Discs:

1. ASTM A48, Class 40C, cast iron.
2. Seating Edge: 316 stainless steel.
3. Configuration: Offset to provide uninterrupted 360-degree sealing surface.

G. Disc Seating Edge:

1. 316 Stainless Steel

H. Valve Shaft and Disc Shaft Fasteners:

1. Material: 304 stainless steel, (one piece for 3” – 20” valves).
2. Seal: V-type packing; carbon graphite/braided carbon with externally adjustable packing gland; minimum of 4 rings.

I. Rubber seats:

1. Installed in valve body only. No cartridge type or seats attached to disc allowed.
2. Buna-N.
3. No retainer bolts, clamps, or rings are allowed to retain the seats.

J. Valves shall be shop lined and coated with a High Solids Epoxy.

1. The Epoxy shall be NSF-61 Approved.
2. The Epoxy shall be a minimum of 8mils DFT per AWWA C550.

K. Butterfly Valves Operator

1. Operators and component parts: AWWA C504, unless otherwise specified in these Specifications.
2. Provide with counterclockwise opening manual operators.
3. Compute operation torque of each valve and operator in accordance with Appendix of AWWA Standard C504 for velocity of 16 fps and applicable pressure drop across valve.
4. Operators: Sized for bi-directional flow and 450 ft-lb input torque.
5. Required input torque with maximum handwheel pull of:
    a. 80 lbs. for hand wheels and chain wheels, or
    b. 150 ft.-lbs. for operating nuts.
6. Hand wheels: 2-inch operating nut. Conform to detail drawings and provide adequate operating space.
7. Totally enclosed, permanently lubricated and sealed gear reducers.
8. Self-locking with open and close stops provided to limit valve disc travel.
9. Traveling nut type or worm gear.
10. Submit calculations for valve torque requirements to Engineer as part of Shop Drawing submittal package. Velocity for dynamic torque must be 16 fps.
11. Valve operators, as manufactured by:
    a. Henry Pratt Company
    b. Mueller
12. Provide butterfly valves which are directly buried or submerged with 2-inch square operating nut and do not equip with position indicator unless otherwise specified.

2.5 COMBINATION VACUUM AND AIR RELIEF VALVE

A. The Contractor shall furnish all air and vacuum relief valves required as shown on project drawings. Contractor shall furnish all piping, fittings, tap wrap, gaskets, bolts, washer, nuts, valve boxes, valve box risers, valve box lids, etc. required for satisfactory completed installation.

B. Manufacturer:

1. Crispin

2. Substitutions: Section 01 60 00 - Product Requirements.

C. Ends: threaded.

D. Cast Iron Body

E. Orifice: rated for 11 – 300 psig

F. Orifice Seat: stainless steel and EPDM rubber

G. Plug and Float: Stainless Steel.

H. The air and vacuum relief assemblies shall be delivered to the Contractor as a complete assembly ready for installation.

2.6 FINISHES

A. All cast iron valve components shall be liquid or fusion-bonded epoxy interior and exterior coated and lined per AWWA C210, AWWA C550 and NSF61. Minimum coating thickness shall be 12 mils. Epoxy shall not contain any coal tar and shall be NSF-61 compliant.

2.7 GATE AND BUTTERFLY VALVE BOXES

A. Each buried valve shall be installed in a pre-cast valve box as shown on the Contract Drawings.

2.8 COMBINATION AIR VACCUM AND RELIEF VALVE BOXES

A. Each combination air vacuum and relief valve shall be installed in a valve box as shown on the Contract Drawings.

2.9 EXTENSION STEMS

A. Extension stems shall be Mueller Model A-26441, Kennedy, or approved equal. Stem diameters shall be 1-1/4 in unless otherwise shown.

B. Stem guides shall be Mueller A-26448, Kennedy, or approved equal.

2.10 T-HANDLED OPERATING WRENCHES

A. Provide two 5-foot-long galvanized T-handled operating wrenches with socket to fit 2-inch square nut. Wrenches shall be Mueller A-24610, Clow F-2520, or approved equal.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection:

1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

2. Verify that all materials may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Engineer.

2. Do not proceed with installation in area of discrepancy until all such discrepancies have been fully resolved.

3.2 INSTALLATION

A. General:

1. Installation of valves and appurtenances shall be as shown on the Contract Drawings and as specified herein.

2. Install all materials in strict accordance with the manufacturer's recommendations.

3. Before installation, carefully clean valves of all foreign material, adjust stuffing boxes, and inspect valves in open and closed positions. Install valves in accordance with the applicable portions of these Specifications. Unless otherwise indicated, install valves with the stem vertical. Mount horizontal valves in such a manner that adequate clearance is provided for operation. Installation practices shall conform to manufacturer's recommendations.

4. Support and restrain all valves where necessary, free from distortion or strain on valve or connecting pipe. No not use pipe to support valve.

5. Prior to installing flanged valves, the flange faces shall be thoroughly cleaned. After cleaning, insert the gasket and tighten the nuts progressively and uniformly. If flanges leak under pressure, loosen the nuts, reseat or replace the gasket, re-tighten the nuts, and retest the joint. Joints must be watertight at test pressures before acceptance.

6. Thoroughly clean threads of screwed joints by wire brushing, swabbing, or other approved method. Apply approved joint compound to threads prior to making joint. Joints shall be watertight at test pressures before acceptance.

7. Provide all accessories necessary for proper valve operation. Install all buried valves with 2-inch square nuts and valve box with cover. Provide buried valves with extension stems if the operating nut would be 36-inches or more underground.

3.3 AIR AND VACUUM RELEASE VALVE INSTALLATION

A. Contractor shall furnish and install air and vacuum release valves as shown on the Contract Drawings and install per manufactures written directions.

3.4 PAINTING

A. Prior to acceptance, thoroughly clean all materials contained herein and paint any surfaces requiring re-painting as determined by the Engineer, in accordance with manufacturers' recommendations.

3.5 VALVE IDENTIFICATION

A. Provide all valves with a stamped valve tag with valve ID. Provide valve chart indicating valve tag number, location of valve, service and normal position of valve, valve manufacturer, size, and pressure rating.

3.6 ADJUSTMENT

A. Check and adjust valves and accessories for smooth operation. Lubricate in accordance with manufacturer’s recommendation.

B. Pack all gate valve stuffing boxes with an excess of packing (30%) for future adjustment.

PART 4 TESTING

4.1 TESTS

A. General: Upon completion of this portion of the work, and prior to acceptance by the District, make all required tests and perform all required disinfection and bacteriological testing per Section 33 01 10 – Disinfection of Water Utility Distribution.

B. Hydrostatic Testing: Valves and related materials will be tested in accordance with Section 33 14 00 – Piping Systems at the same time that the adjacent pipeline is tested. Joints shall show no visible leakage under test. Repair joints that show signs of leakage 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 will be held responsible for any damage caused by the testing.

C. Functional Testing:

1. Valves which are normally closed shall satisfactorily be closed, opened and closed by the District's representative.

2. Valves which are normally open shall satisfactorily be opened, closed and opened by the District's representative.

END OF SECTION

SECTION 33 14 20

FIRE HYDRANTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire Hydrants

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for the items in this section shall be included in the Fire Hydrant Assembly Bid Item. No additional measurement or payment shall be made for the requirements of this section.

1.3 REFERENCES

A. American Water Works Association:

1. 1. AWWA C503 - Wet-Barrel Fire Hydrants.
2. 2. AWWA C550 - Protecting Epoxy Interior Coating for Valves and Hydrants.
3. 3. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
4. B. National Sanitation Foundation:
5. 1. NSF 61 - Drinking Water System Components - Health Effects

B. National Fire Protection Association:

1. 1. NFPA 281 - Recommended Practice for Fire Flow Testing and Marking of Hydrants

1.4 SUBMITTALS

A. Section 01 33 00 – “Submittal Procedures”: Requirements for submittals.

B. Shop Drawings:

1. Installation Plan: Submit description of proposed installation.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of fire hydrants.

1.6 QUALITY ASSURANCE

A. Provide uniform color scheme for fire hydrants in accordance with NFPA 281.

B. Perform work in accordance with Humboldt County Public Works standard.

C. Maintain at least one copy of this document on site.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 – “Product Requirements”: Requirements for transporting, handling, storing and protecting products.

B. Store products in areas protected from weather, moisture, or possible damage; do not store products directly on ground; handle products to prevent damage to interior or exterior surfaces.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Refer to Section 01 57 19, Environmental Requirements

B. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.9 COORDINATION

A. Section 01 30 00 – “Administrative Requirements”: Requirements for coordination.

B. Contractor shall not take any existing fire hydrant out of service without a minimum of fourteen (14) calendar days’ notice to the Engineer in writing. All hydrant service piping shall be installed and in place, connected to the new active water main, prior to disconnecting hydrants from the existing water main. Upon disconnecting a hydrant from the existing water main, the Contractor shall diligently proceed to connecting the hydrant to the new main.

PART 2 PRODUCTS

2.1 ACCESSORIES

A. Joint restraints.

B. Concrete for thrust restraints.

C. Aggregate: Aggregate for hydrant drainage specified in Section 31 23 33 – Trenching and Backfilling and Compacting.

D. Breakable flange unit and breakaway reset kit

1. Hydrant Guard ST/STL HG2 or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 – “Administrative Requirements”: Verification of existing conditions before starting work.

B. Determine exact location and size of hydrants from Drawings; obtain clarification and directions from Engineer prior to execution of work.

C. Verify invert elevations prior to excavation and installation of fire hydrants.

3.2 PREPARATION

A. Identify required lines, levels, contours and datum locations.

B. Locate, identify, and protect utilities to remain from damage.

C. Do not interrupt existing utilities without permission and without making arrangements to provide temporary utility services.

1. Notify Engineer not less than 14 working days in advance of proposed utility interruption.

2. Do not proceed without written permission from the Engineer.

D. Perform trench excavation, backfilling and compaction in accordance with Section 31 23 33 – Trenching and Backfilling.

3.3 INSTALLATION

A. Install salvaged fire hydrants; provide support blocking and drainage gravel; do not block drain hole.

B. Set hydrants plumb with pumper nozzle facing roadway; set hydrants with centerline of pumper nozzle 18 inches above finished grade and safety flange not more than six (6)-inches nor less than two (2)-inches above grade.

C. Paint salvaged hydrants in accordance with local color scheme, color to be confirmed by Owner

D. After hydrostatic testing, flush hydrants and check for proper drainage.

3.4 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 33 01 10 – “Disinfection of Water Utility Distribution.”

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 – “Quality Requirements”: Field inspecting, testing, adjusting, and balancing.

B. Hydrostatic Testing: Fire hydrants will be tested in accordance with Section 33 14 00 – Water Piping Systems at the same time that the adjacent pipeline is tested. Joints shall show no visible leakage under test. Repair joints that show signs of leakage 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 will be held responsible for any damage caused by the testing.

END OF SECTION

SECTION 33 31 00

SANITARY UTILITY SEWERAGE PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. PVC sanitary sewage pipe.
2. Underground pipe markers.
3. Bedding and cover materials.

B. Related Sections:

1. Section 31 05 13 - Soils for Earthwork: Soils for backfill in trenches.
2. Section 31 05 16 - Aggregates for Earthwork: Aggregate for backfill in trenches.
3. Section 31 23 16 - Excavation: Product and execution requirements for excavation required by this section.
4. Section 31 23 33 – Trenching and Backfilling: Execution requirements for trenching and backfill to be placed by this section.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment for the items in this section shall be included in the Bid Item to which they relate. No additional measurement or payment shall be made for the requirements of this section.

1.3 RELATED SECTIONS

A. American Association of State Highway and Transportation Officials:

1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.

B. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3).

3. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

4. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

5. ASTM D2751 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.

6. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

7. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

8. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

9. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

1.4 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data indicating pipe material used and pipe accessories.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution Requirements: Requirements for submittals.

B. Project Record Documents: Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.7 QUALITY ASSURANCE

A. Perform Work in accordance Caltrans Standard Plans.

1.8 FIELD MEASUREMENTS

A. Verify field measurements and elevations are as indicated.

1.9 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate the Work with termination of sanitary sewer connection outside building, connection to sewer main, and trenching.

PART 2 PRODUCTS

2.1 SANITARY SEWAGE PIPE

A. Color: Green

B. Gravity PVC Laterals and Mains (size 4-inch and larger): ASTM D3034, Poly (Vinyl Chloride) (PVC) material; inside nominal diameter as specified on the Drawings, bell and spigot style rubber ring sealed gasket joint.

1. Fittings: PVC.

2. Joints: ASTM F477, elastomeric gaskets.

3. Diameter ratio: SDR 35

C. PVC Force Mains (size 3-inch and smaller): SCH 80

1. Joints:

a. Mechanical and Push-On Joints: AWWA C111.

b. Flanged Joints: AWWA C115, ASME B16.1, ANSI B16.1 250 lb flat faced.

c. Restrained Joints: Refer to Part 2.02.

d. Gaskets: Conforming to ANSI A21.11. Gaskets for flanged joints shall be 1/8-in thick, cloth inserted rubber, full faced with holes to pass bolts.

e. Bolts: Bolts and nuts shall be low alloy steel ASTM A193. The alloy composition shall be such that the bolts are cathodic to the coupling. Washers of the same material shall be supplied.

2.2 COUPLINGS

A. Manufacturer

1. JCM Industries or approved equal.

2. Substitutions: Section 01 60 00 - Product Requirements.

B. Materials:

1. Body - Ductile Iron; ASTM A536

2. Bolts: Stainless Steel

C. Pressure rating: meet or exceed adjacent piping system rating.

D. System compatible with connecting pipe; verify connecting pipe O.D.

2.3 UNDERGROUND PIPE MARKERS

A. Plastic Ribbon Tape: Bright colored, continuously printed, minimum 4 inches wide by 4 mil thick, manufactured for direct burial service.

2.4 UNDERGROUND TRACER WIRE

A. Underground tracer wire shall be #10 AWG THWN - Thermoplastic Heat and Water-Resistant Nylon Coated - copper wire, with yellow insulation.

2.5 DETECTABLE PIPE LOCATING TAPE

A. Detectable pipe locating tape shall consist of solid aluminum foil encased in a protective high-visibility, inert polyethylene plastic jacket. Foil is to be visible on the unprinted side. Minimum overall thickness shall be 5.5 mils. Tape width shall be SIX (6) inches. Tape color and lettering shall be in accordance with the APWA Uniform Color Code for Marking of Underground Utility Locations. The identifying lettering shall be a minimum of one (1)-inch-high permanent black lettering imprinted continuously over the entire length. The tape shall be Terra “D” as manufactured by Reef Industries, Allen Detectable, or approved equal.

B. After the trench is backfilled to within 18 inches of the finished grade the Contractor shall install a detectable pipe locating tape over all sewer mains. The backfill shall be sufficiently leveled so that the tape will be installed on a flat surface. The tape shall be centered in the trench and laid flat with printed side up. Caution shall be exercised to avoid displacement and to ensure its integrity.

2.6 BEDDING AND COVER MATERIALS

A. Bedding: Fine Aggregate Fill as specified in Section 31 05 16.

B. Class 2 Aggregate Base as specified in Section 31 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.

3.2 PREPARATION

A. Correct over excavation with fine aggregate.

B. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling or compaction.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 31 23 33.

B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches.

C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with ASTM D2321. Seal joints watertight.

B. Lay pipe to slope gradients noted on drawings; with maximum variation from indicated slope of 1/8 inch in 10 feet. Pipe shall be installed at continuous slope as shown on drawings.

C. Excavate bell holes to permit proper joint installation.

D. Install pipe to have bearing along entire length of pipe.

E. Install bedding at sides and over top of pipe to minimum compacted thickness of 6 inches.

F. Install underground tracer wire on top of all pipelines. Bring tracer wire to surface at each manhole and provide approximately (3) feet of excess wire coiled neatly and bracketed to edge of manhole.

G. Refer to Section 31 23 33 for backfilling and compacting requirements. Do not displace or damage pipe when compacting.

H. Install plastic ribbon tape continuous over top of pipe buried 18 inches below finish grade, above pipeline; coordinate with Section 31 23 33.

I. Install Work in accordance with American Water Works Association standards.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Engineer shall be notified and shall observe all new sewer pipe installation.

C. If, in the opinion of the Engineer, the sewer pipe has not been properly installed, the Contractor shall remove and replace new sewer pipe at no additional cost to the Owner.

D. Perform test on site sanitary sewage system in accordance with American Water Works

3.6 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution Requirements: Requirements for protecting finished Work.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

PART 5
DRAWINGS

APPENDIX A
GEOTECHNICAL REPORT

GEOTECHNICAL REPORT

MCSD Central Ave Water and Sewer Mains
McKinleyville, California

Prepared by:

Crawford & Associates, Inc.
1100 Corporate Way, Suite 230
Sacramento, CA 95831

March 24, 2022

Prepared for:

GHD Inc
718 Third Street
Eureka, CA 95501

Crawford & Associates, Inc.
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March 24, 2022
Crawford File No. 20-640.2

Mr. Nathan Stevens, PE
718 Third Street
Eureka, CA 95501

Subject: **GEOTECHNICAL REPORT**
MCSD Central Ave Water and Sewer Mains
McKinleyville, California

Dear Mr. Stevens,

Crawford & Associates, Inc (Crawford) presents this Geotechnical Report for the McKinleyville Community Service District (MCSD) Central Avenue Water and Sewer Mains project. Crawford prepared this report in accordance with our December 6, 2021 agreement.

This report defines the geotechnical conditions and geologic hazards as evaluated from field and laboratory test data and used in the development of the geotechnical design. The purpose of this report is to define geologic hazards and provide recommendations for use in project design, specifications, and construction.

Thank you for the opportunity to be part of your design team. Please contact us if you have questions or require additional information.

Sincerely,

Crawford & Associates, Inc.,

Reynicole Gilbert, MS, EIT
Senior Engineer

Chris Trumbull, PE, GE, D.GE
Senior Project Manager

Taber
Since 1954

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 PURPOSE 1
1.2 SCOPE OF SERVICES 1
2 PROJECT DESCRIPTION 1
3 SITE DESCRIPTION 1
4 GEOLOGY AND SEISMICITY 2
4.1 REGIONAL GEOLOGY 2
4.2 SITE GEOLOGY 2
4.3 FAULTING 2
5 SUBSURFACE EXPLORATION 2
6 SUBSURFACE CONDITIONS 3
6.1 SUBSURFACE MATERIALS 3
6.2 GROUNDWATER 4
7 LABORATORY TESTS 4
7.1 CORROSION POTENTIAL 4
8 CONCLUSIONS 5
9 RECOMMENDATIONS 5
9.1 OPEN-CUT PIPELINE RECOMMENDATIONS 5
9.1.1 THRUST RESTRAINT 5
9.1.2 COMPOSITE MODULUS OF SOIL REACTION 6
9.2 PIPE BURSTING 6
9.3 PAVEMENT 7
9.4 CONSTRUCTION CONSIDERATIONS 8
9.4.1 DEWATERING 8
9.4.2 EXCAVATABILITY 8
9.4.3 FILL PLACEMENT & COMPACTION 8
9.4.4 SHORING AND TEMPORARY CONSTRUCTION SLOPES 8
9.4.5 PIT BOTTOM SUPPORT 9
10 RISK MANAGEMENT 9
11 LIMITATIONS 9

LIST OF TABLES

Table 1: Summary of Subsurface Exploration 3
Table 2: Groundwater Data 4
Table 3: Corrosion Test Summary 4
Table 4: Summary of National Association of Sewer Service Companies Pipe Bursting Classification 7
Table 5: HMA Section – County Standard Detail 7
Table 6: Pavement Section – Native Backfill 8

APPENDIX I

Figure 1: Vicinity Map
Figure 2: Exploration Map
Figure 3: Geologic Map
Figure 4: Fault Map

APPENDIX II

Boring Log Legend
Boring Logs

APPENDIX III

Laboratory Test Results

1 INTRODUCTION

1.1 PURPOSE

Crawford & Associates, Inc. (Crawford) completed this Geotechnical Report for the McKinleyville Community Service District (MCSD) Central Avenue Water and Sewer Main project in McKinleyville, California. The purpose of this report is to provide geotechnical and geologic data and provide conclusions and recommendations for design aspects of the project.

1.2 SCOPE OF SERVICES

To prepare this report, Crawford:

- Discussed the project with Nathan Stevens with GHD Inc;
- Reviewed published topographic, geologic, and seismic maps pertaining to the site;
- Drilled, logged and sampled four borings to a maximum depth of 21.5 feet (ft) below ground surface (bgs) on January 10, 2022;
- Performed laboratory tests on representative soil samples from the borings;
- Performed geotechnical engineering calculations and analysis to develop our recommendations.

2 PROJECT DESCRIPTION

This project includes replacement/rehabilitation of sewer and water mains along Central Ave between its intersections with Sutter Road and Hiller Road, an approximately 0.42-mile-long distance. The existing 6- to 8-inch-diameter asbestos cement sewer line is located between 8 to 11 ft bgs and the existing 16-inch-diameter asbestos cement water line is located between 3 to 5 ft bgs.

The proposed sewer line and water line will consist of 6- to 10-inch and 16-inch diameter, respectively, high-density polyethylene (HDPE), PVC, and/or cured in place pipe liner installed using pipe bursting, open cut trenching, or lining, respectively. We assume the pipelines will be installed in accordance with the Humboldt County Type I Trench Detail – Aggregate Base Backfill.

See the attached Figures 1 and 2 for the Vicinity Map and Exploration Map.

3 SITE DESCRIPTION

The project is located in the MCSD along Central Avenue (Ave) at approximate latitude 40.9382° N and longitude 124.1009° W (approximate center of alignment). Central Ave, or Business Loop US 101, allows business access along central McKinleyville. At its southern end, the road begins where US 101 enters McKinleyville, and at its northern end it rejoins US 101 in northern McKinleyville near Clam Beach. Central Ave along the project alignment is a five lane, relatively level, asphalt-paved road, which includes two northbound, two southbound, and a center turning lane. Concrete paved sidewalks run along both sides of the road. Along the project alignment, Central Ave generally follows a north-south alignment.

4 GEOLOGY AND SEISMICITY

4.1 REGIONAL GEOLOGY

The project is located within the Coast Ranges geomorphic province of California. This geomorphic province is characterized by a series of discontinuous northwest-trending mountain ranges extending from the Klamath Mountains on the north coast of California to the Transverse Ranges to the south. The Coast Ranges are composed of thick Mesozoic and Cenozoic sedimentary strata that have a complex structure due to intense folding and faulting. The northern Coast Ranges are dominated by the irregular, knobby, landslide-topography of the Franciscan Complex.

4.2 SITE GEOLOGY

Published geologic mapping[1] shows surface materials at the site as Quaternary and Tertiary overlap deposits, within the subunit characterized as Holocene to late Pleistocene aged, undeformed marine shoreline and aeolian deposits (Qm). Soils within this unit are typically composed of gravels and sands. Mapping to the east and south of the project site shows late Pleistocene- to middle Miocene-aged marine and nonmarine overlap deposits (QTw). This unit is composed of weakly lithified siltstone, fine- to medium-grained sandstone, silty to diatomaceous mudstone, and locally scaly mudstone. Locally, this unit includes pebble to boulder conglomerate, carbonate concretions, abundant molluscan fossils, woody debris, and rhyolitic ash. The Geologic Map is provided on Figure 3.

4.3 FAULTING

The project site is situated within the Mad River fault zone, a major imbricate zone of northeast-dipping thrust faults and folds[2]. Published mapping from the USGS Geologic Survey shows a trace of this fault zone crosses Central Ave approximately 0.3 miles north of the northern end of the project alignment, and is bounded by traces to the east and the west at distances of approximately 0.3 miles in either direction. This fault zone is considered active per CGS (CGS considers a fault to be active if it has shown evidence of ground displacement during the Holocene period, defined as the last 11,000 years). The site is not located within an Alquist-Priolo Zone[3].

The Fault Map for this site is shown on Figure 4.

5 SUBSURFACE EXPLORATION

The subsurface exploration for the project consisted of four borings performed by Crawford in January 2022. A summary of explorations is provided below in Table 1. See the attached Figure 2, Exploration Map, in Appendix I for the exploration locations.

[1] McLaughlin, R.J., Ellen, S.D., Blake, M.C., Jayko, A.S., Irwin, W.P., Aalto, K.R., Carver, G.A., Clarke, S.H., Barnes, J.B., Cecil, J.D., and Cyr, K.A.,2000, Geology of the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 X 60 minute quadrangles and adjacent offshore area, northern California, with digital database
[2] Hart, E.W., compiler, 199, Fault number 13, Mad River fault zone, in Quaternary fault and fold database of the Unites States: U.s. Geologic Survey website, https://easrthquakes.usgs.gov/hazards/qfaults, accessed on 01/21/2022
[3] https://maps.conservation.ca.gov/cgs/EQZApp/app/

Table 1: Summary of Subsurface Exploration

Boring I.D.	Completion Date	Boring Depth (ft)	Drill Rig	Hammer Type	Hammer Efficiency Ratio (%)	Drilling Equipment
A-22-001	01/10/2022	21.5	DR10K	Auto	80*	4'' Solid Stem Auger
A-22-002		21.5				7'' Hollow Stem Auger
A-22-003		16.5				4" Solid Stem Auger
A-22-004		16.5				

*Assumed Value

The borings were typically sampled at 2.5 ft intervals for the upper 15 ft and at approximately 5 ft intervals thereafter. Soil samples were recovered by means of 2.0-inch O.D. "Standard Penetration Test" split-spoon sampler (ASTM D1586) with 1.4-inch I.D. liners and a 3.0-inch O.D. "Modified California" split-spoon sampler (ASTM D3550) with 2.4-inch I.D. liners. Samplers were advanced with standard 350 ft-lb striking force using a 140-lb automatic hammer and a drop height of 30 inches. A hammer energy calibration test was not performed specifically for this project, we assumed energy efficiency of 80% for this project.

At each test interval, the sampler was driven 18 inches (or until sampler refusal criterion was met), and the blows required to advance the sampler each 6-inches of penetration were recorded. The sampler refusal criterion is defined as 50 or more blows with less than 6-inches of sampler advancement. The field blow counts were recorded as the number of hammer blows required to drive the sampler the final 12-inches of the 18-inch sample interval, unless refusal was met. The recorded sampler penetration resistance provides a field measure of relative densities and can be correlated to soil strength and bearing characteristics. The field-recorded (uncorrected) blow counts are shown on the boring logs provided in Appendix II.

Crawford logged the exploratory borings consistent with the Unified Soil Classification System (USCS) and the Caltrans 2010 Logging Manual. Selected portions of recovered soil drive samples were retained in sealed containers for laboratory testing and reference. Groundwater observations were recorded during drilling operations when/if encountered and when drilling method allowed. The borings were backfilled with cement grout in compliance with the Humboldt County boring permit requirements.

6 SUBSURFACE CONDITIONS

6.1 SUBSURFACE MATERIALS

Earth materials encountered in the borings are considered consistent with the published mapping and our observations made at the site. The materials identified in the borings that are considered significant to the proposed project generally consists of loose to medium dense clayey sand, clayey sand with gravel, and poorly-graded sand with clay (interpreted as Qm soils). During exploration activities, Crawford did not encounter earth materials consistent with QTw deposits. Refer to the attached boring logs in Appendix II for more specific soil/rock descriptions, sampling methods, laboratory test results and blow count data.

6.2 GROUNDWATER

At the time of our January 2022 exploration, groundwater was encountered in Borings A-22-001 and A-22-002. Moist to wet soil conditions were encountered in borings A-22-003 and A-22-004 at about 10 to 12 ft bgs, but groundwater was not encountered. Groundwater levels encountered in the borings are summarized in Table 2.

Table 2: Groundwater Data

Boring I.D.	Date	Boring Depth (ft)	Groundwater Depth (ft)
A-22-001	01/10/2022	21.5	12.5
A-22-002	01/10/2022	21.5	15.4
A-22-003	01/22/2022	16.5	Not Encountered
A-22-004	01/22/2022	16.5	Not Encountered

Groundwater levels in general will fluctuate due to changes in precipitation, seasonal fluctuations, and other site factors.

7 LABORATORY TESTS

The following laboratory tests were completed on representative soil samples obtained from the exploratory borings:

- Moisture-Density Tests (ASTM D2216/7263)
- 200 Wash (ASTM D1140)
- Plasticity Index (ASTM D4318)
- pH/Minimum Resistivity (CTM 643)
- Sulfate/Chloride Content (CTM 417/422)
- Redox Potential (ASTM G-200m)
- Sulfides (AWWA C105/A25.5)

The laboratory results are provided in Appendix III.

7.1 CORROSION POTENTIAL

A soils corrosivity analysis is important for estimating and mitigating the deterioration of buried ferrous metals and concrete. Corrosion testing was performed on one sample. Table 3 summarizes the results of the corrosivity testing completed on select sample obtained from the borings to evaluate the corrosion potential of the subsurface materials.

Table 3: Corrosion Test Summary

Boring-Sample No.	Depth (feet)	pH	Redox Potential (mV)	Sulfides Presence	Minimum Resistivity (ohm-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
A-22-001-1A	3.5	4.93	(+) 391	Negative	8,840	7.1	3.4

*Red indicates test results beyond the corrosive threshold

Crawford used the10-point system in C105/A21.5 (ANSI/AWWA1999) to evaluate the potential for external correction potential on ductile iron pipe from the soil. The results of the 10-point system analysis was 1 point; the long life of historical unprotected pipe in soil with less than 10 points indicates a non-corrosive environment (AWWA 2005).

According to ACI 318, a sulfate concentration less than 1,000 parts per million (ppm) is considered negligible. A chloride content of less than 600 ppm is non-corrosive to reinforced concrete.

Based on the test results in Table 3 and ACI, the site is non-corrosive to concrete and ferrous metals. The tests results are only an indicator of soil corrosivity and the designer should consult with a corrosion engineer if these values are considered significant.

8 CONCLUSIONS

We conclude that the alignment is suitable for construction of the proposed pipeline provided the recommendations presented below are included in design and construction. Key geotechnical consideration associated with design and construction of this project included slope stability of the temporary trench excavation for pipeline construction.

9 RECOMMENDATIONS

9.1 OPEN-CUT PIPELINE RECOMMENDATIONS

9.1.1 THRUST RESTRAINT

Unbalanced thrust forces develop in a pipeline due to internal pressures, particularly around change of direction in the pipeline alignment. For large diameter pipelines, these thrust forces are typically counteracted by frictional resistance along the pipe and restrained joints.

Restrained joints resist thrust forces through friction between the pipe and the soil surrounding it. Per AWWA M11, the length of pipeline required to restrain each side of an alignment bend is:

$$L = \frac{PA(cos\Delta)}{\mu(W_e + W_w + W_p)}$$

Where:

L = length of restrained or harnessed joints on each side of the bend or elbow (ft)
P = internal pressure (psi)
A = cross-sectional area of the pipe (in^2)
Δ = bend or elbow deflection (degrees), 0° to 90°
μ = coefficient of friction between the pipe and the soil
W_e = horizontal bends: two times the weight of the prism of soil over the pipe (lb/ft of pipe length)
= vertical bends: weight of the prism of soil over the pipe (lb/ft of pipe length)
W_p = weight of the pipe (lb/ft)
W_w = weight of the contained water (lb/ft)

The coefficient of friction, μ, between a concrete pipe and the surrounding soil is modeled as: $\mu = tan\,(0.6\phi)$, where ϕ is the soil friction angle. Assuming a soil friction angle of 34° for compacted coarse grained, angular backfill material, we recommend using μ = 0.40.

Although likely unnecessary for the majority of this project, thrust blocks may also be used if additional thrust resistance is needed. Thrust block design is governed by two factors – the total thrust force and the allowable passive pressure of the soil. Allowable passive pressure will be variable throughout the alignment due to varying soil conditions. We calculated passive pressures at each of our boring locations to assess trending values along the alignment. The range of values was 330-415 pcf. Based on this trend, we recommend a passive pressure of 375 pcf across the alignment for thrust block design. The upper 12 inches of soil should be ignored.

9.1.2 COMPOSITE MODULUS OF SOIL REACTION

The Modulus of Soil Reaction values (E') have been estimated for initial backfill (embedment material) and for the anticipated native trench wall soils at the pipe springline (horizontal plane through the pipe center). Values of E' for native soils (E'n) and initial backfill materials (E'b) are used in combination to calculate flexible pipe deflections using either the Iowa (Spangler 1941) or US Bureau of Reclamation (USBR 1997) equations. An E'n value of 1,500 psi is estimated for native clayey sand soil and an E'b value of 1,600 psi may be used for clean crushed rock or sand material compacted to at least 90 percent compaction, per ASTM D1557. Assuming the trench width is at least 24 inches at the proposed sewer pipeline location and at least 36 inches at the proposed water pipeline location, a composite E' of 1,550 psi is recommended. If these values result in excessive calculated lateral deflection in flexible pipes, consideration should be given to widening the trench to provide more higher-modulus backfill along the side of the pipe.

9.2 PIPE BURSTING

Pipe bursting is a trenchless method of pipe replacement that utilizes expansive tools to breakthrough and displace existing pipe and pull the new pipe in place. Based on the moderately compressible native materials encountered in the borings (predominately loose to medium dense clayey sand), proposed pipe information provided by GHD, and Table 4 (below), it appears that the degree of difficulty for pipe bursting, however feasible, could be moderate to challenging. If the burst lengths exceed 450 feet, difficulty could be challenging to extremely challenging.

Table 4: Summary of National Association of Sewer Service Companies Pipe Bursting Classification

Pipe Bursting Difficulty	Pipe Depth (ft)	Existing Pipe Inner Diameter (in)	New Pipe Diameter Compare to Existing	Burst Length	Compressibility of Soils Outside of Trench[4]
Minimal	<12	<12	Same size or one diameter upsize	≤350	Compressible
Moderate to Challenging	12-18	12-20	Two diameters upsize	350-450	Moderately Compressible
Challenging to Extremely Challenging	≥18	20-36	Three or more diameters upsize	>450	Incompressible

The selected contractor should have demonstrated experience performing similar type work. We were unable to classify the existing pipe bedding material as our field exploration activities were conducted sufficiently far from existing utilities as to not cause damage. The contractor will be responsible for classifying existing trench backfill material (for use in construction related means and methods). In addition, the contractor will be responsible for determining the appropriate pipe bursting method and equipment to be used during construction, and for any damage (if incurred) to surrounding utilities.

9.3 PAVEMENT

The Humboldt County Type 1 Trench Detail indicates 2.25 ft of Aggregate Base (AB) backfill compacted to 95% relative compaction will be used. Using varying traffic indices, Chapter 630 of the Caltrans Highway Design Manual (2020), and AB subgrade, we recommend the minimum Hot Mix Asphalt (HMA) sections shown in Table 5 below for pavement design.

Table 5: HMA Section – County Standard Detail

Traffic Index	HMA (ft)
6.0	0.25
6.5	0.30
7.0	0.30
7.5	0.35
8.0	0.40
8.5	0.40

If the Humboldt County Standard Detail is not used and native or other import material (minimum R-value 35) is used, the following minimum sections in Table 6 should be used for design.

[4] Compressible = loose granular or soft cohesive soils; moderately compressible = medium dense to dense granular or medium to stiff cohesive soils; incompressible = very dense granular, hard clay, or rock.

Table 6: Pavement Section – Native Backfill

Traffic Index	Pavement Sections	
	HMA (ft)	AB (ft)
6.0	0.25	0.60
6.5	0.30	0.65
7.0	0.30	0.75
7.5	0.35	0.75
8.0	0.40	0.80
8.5	0.40	0.90

9.4 CONSTRUCTION CONSIDERATIONS

9.4.1 DEWATERING

Based on our observed groundwater levels encountered during our January 2022 drilling activities, we encountered groundwater within borings A-22-001 and -002 at between 12 and 16 ft bgs. We also encountered moist soil below 10 ft bgs. Groundwater may adversely affect construction of portions of the pipeline located near and/or between these boring locations. In addition, isolated areas of groundwater seepage could be encountered along other portions of the alignment.

The contractor should be responsible for designing and implementing a dewatering system to meet the requirements of the project. Dewatering operations should draw down the groundwater down to a minimum of 3 ft below the planned excavation during construction. Dewatering operations may enter into layers of sandy material that may yield significant water.

9.4.2 EXCAVATABILITY

Based on the conditions observed in our subsurface explorations and our experience, the on-site soil should be excavatable with typical equipment such as backhoes and excavators. Depending on county easement dimensions and pavement configurations, the contractor may need to shore the existing roadway to accommodate traffic if there is insufficient room to properly slope the trench excavation.

9.4.3 FILL PLACEMENT & COMPACTION

Bedding material and specifications should be consistent with County of Humboldt Department of Public Works Type 1 Trench Detail Standard Drawing.

The bedding material should be placed in loose lifts no thicker than 6 inches. Subgrade and fill should be compacted to a minimum of 95% relative compaction (based on ASTM D1557 test procedure) within the upper 2.5 ft of the trench. Below this and above the pipe, the fill should be compacted to a minimum of 90% relative compaction.

9.4.4 SHORING AND TEMPORARY CONSTRUCTION SLOPES

At a minimum, all shoring and temporary construction slopes should be in accordance with current CalOSHA requirements. Our data indicates CalOSHA Soil Type C will be encountered

throughout the project alignment. Isolated locations of unstable sandy soils should be expected, particularly where the trench is adjacent to existing utilities or other improvements. Traffic and construction vibrations need to be considered in shoring applications.

The contractor is responsible for all shoring and temporary slope design based on actual excavation conditions encountered during construction. Shoring will need to be conducive to the contractor's approach to managing groundwater (where needed) and the excavation.

9.4.5 PIT BOTTOM SUPPORT

Based on our subsurface exploration, the side pits (approximately 3 to 11 ft deep) will be founded in loose to medium dense clayey sand. If unstable subgrade conditions are encountered, the base should be overexcavated an additional 12 to 18 inches and replaced with clean ¾-inch crushed rock to provide a suitable working surface.

10 RISK MANAGEMENT

Our experience, and that of our profession, clearly indicates the risks of costly design, construction, and maintenance problems can be significantly lowered by retaining the Geotechnical Engineer of Record to provide additional services during design and construction. For this project, Crawford should be retained as the Geotechnical Engineer of Record to:

- Review and provide comments on the civil plans and specifications (insofar as they rely on the geotechnical recommendations contained in this report) prior to 90% plan set submittal.
- Update this report if design changes occur, two years or more lapse between this report and construction, and/or site conditions have changed.

Should there be any change in the project or should subsurface conditions differ from those described in this report be encountered during construction, this office should be contacted/notified for evaluation and supplemental recommendations, as needed.

Crawford is not responsible for any other parties' interpretation of this report and recommendations contained herein, as well as subsequent addendums, letters, and discussions. If others perform the construction observation, they should review this report and either accept the conclusions and recommendations herein as their own or provide alternative recommendations.

11 LIMITATIONS

Crawford performed services in accordance with generally accepted geotechnical engineering principles and practices currently used in this area. Do not use this report for different locations and/or projects without the written consent of Crawford. Where referenced, we used ASTM standards as a general (not strict) guideline only. We do not warranty our services.

Crawford based this report on the current site conditions. We assumed the soil and groundwater conditions are representative of the subsurface conditions at the site. Actual conditions will vary along the project alignment. The interface shown between soil materials on the exploration logs is approximate; the transition between material types may be abrupt or gradual. The

recommendations contained herein are based on the final exploration logs, which represent our interpretation of the boring logs and general knowledge of the site and geological conditions.

Our scope did not include evaluation of flooding potential and aerial photograph review. Please contact Crawford if you would like an evaluation of one or more of these potentially damaging issues.

Modern design and construction are complex, with many regulatory sources/restrictions, involved parties, and construction alternatives. It is common to experience changes and delays. The owner should set aside a reasonable contingency fund based on complexities and cost estimates to cover changes and delays.

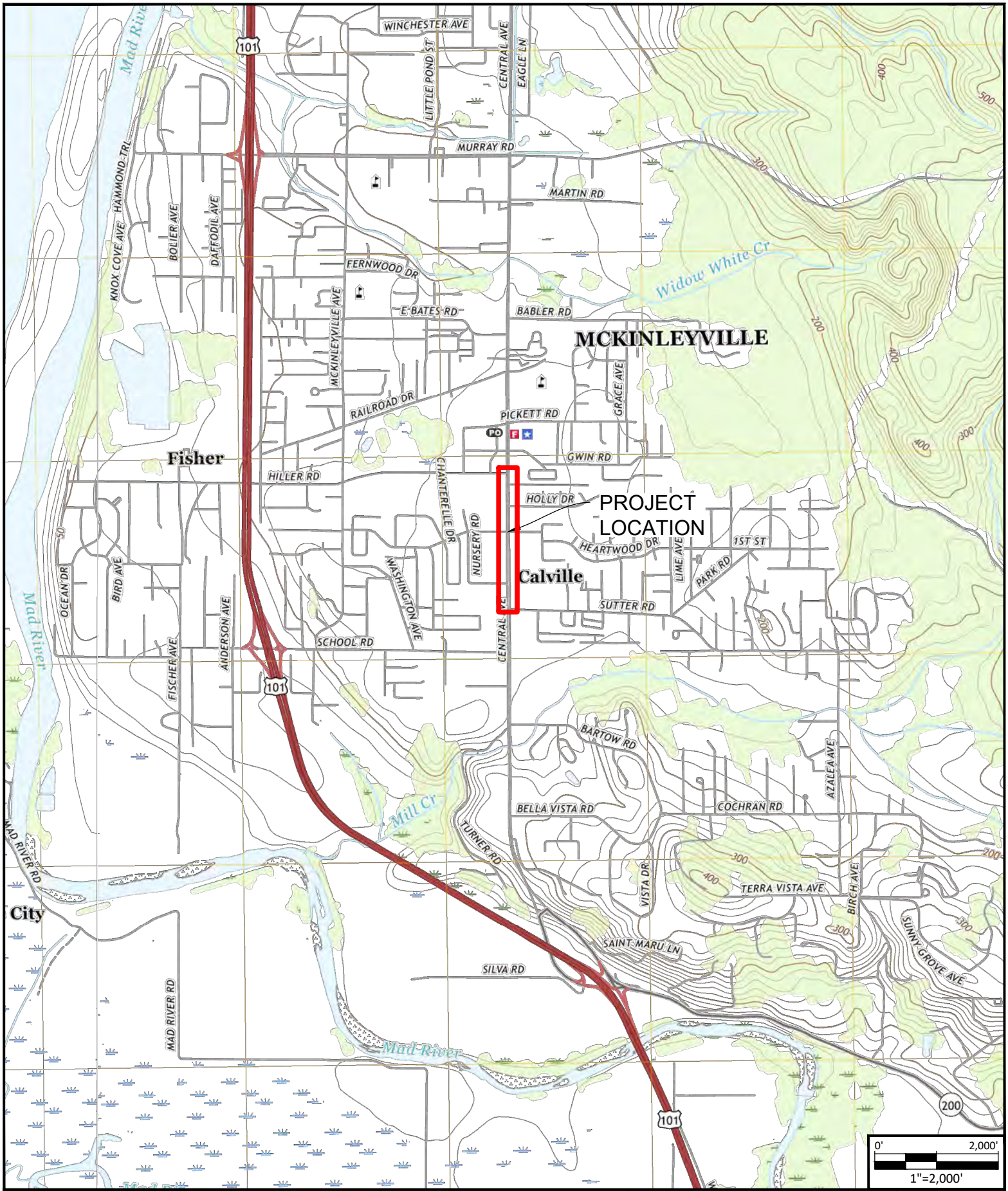
APPENDIX I

Figure 1: Vicinity Map

Figure 2: Exploration Map

Figure 3: Geologic Map

Figure 4: Fault Map



NORTH

Source:
USGS 7.5' Topographic Maps, Tyee City, Humboldt County, California, 2018, Scale: 1:24,000.

USGS 7.5' Topographic Maps, Arcata North, Humboldt County, California, 2018, Scale: 1:24,000.

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MCSD WATER & SEWER MAIN REPLACEMENT

MCKINLEYVILLE, CA

Figure 1
Vicinity Map

Prj. No: 20-640.2
Date: 2/1/2022

Source:
Basemap: AutoCAD Civil3D Geolocation Tool, using Bing Maps

Utility Data: Utility Data provided by MCSD via electronic transfer

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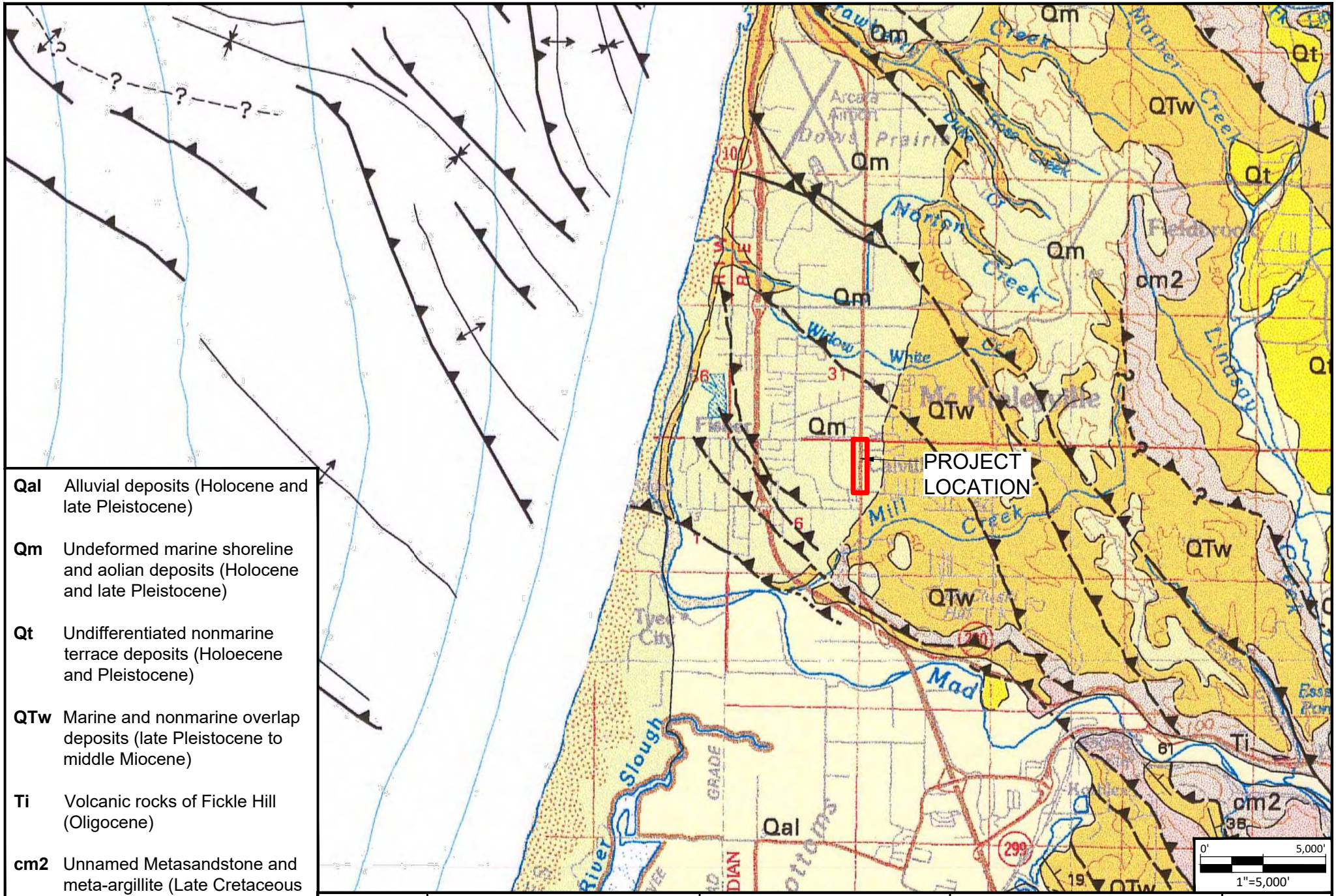
MCSD WATER & SEWER MAIN REPLACEMENT

MCKINLEYVILLE, CA

Figure 2
Exploration Map

Prj. No: 20-640.2
Date: 03/07/2022



Qal Alluvial deposits (Holocene and late Pleistocene)

Qm Undeformed marine shoreline and aolian deposits (Holocene and late Pleistocene)

Qt Undifferentiated nonmarine terrace deposits (Holoecene and Pleistocene)

QTw Marine and nonmarine overlap deposits (late Pleistocene to middle Miocene)

Ti Volcanic rocks of Fickle Hill (Oligocene)

cm2 Unnamed Metasandstone and meta-argillite (Late Cretaceous to Late Jurassic) - Melange

MAP SYMBOLS

Contact-Dashed where approximate, dotted where concealed, queried where uncertain

Fault-Dashed where approximate, dotted where concealed, queried where uncertain

Thrust fault-Barbs on upper plate, dashed where approximate, dotted where concealed, queried where uncertain

NORTH

Source:
McLaughlin, R.J., Ellen, S.D., Blake, M.C., Jayko, A.S., Irwin, W.P., Aalto, K.R., Carver, G.A., Clarke, S.H., Barnes, J.B., Cecil, J.D., and Cyr, K.A.; Geology of the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 X 60 minute quadrangles and adjacent offshore area, northern California, with digital database; Miscellaneous Field Studies Map MF-2336; Scale: 1:100,000; U.S. Geological Survey, 2000.

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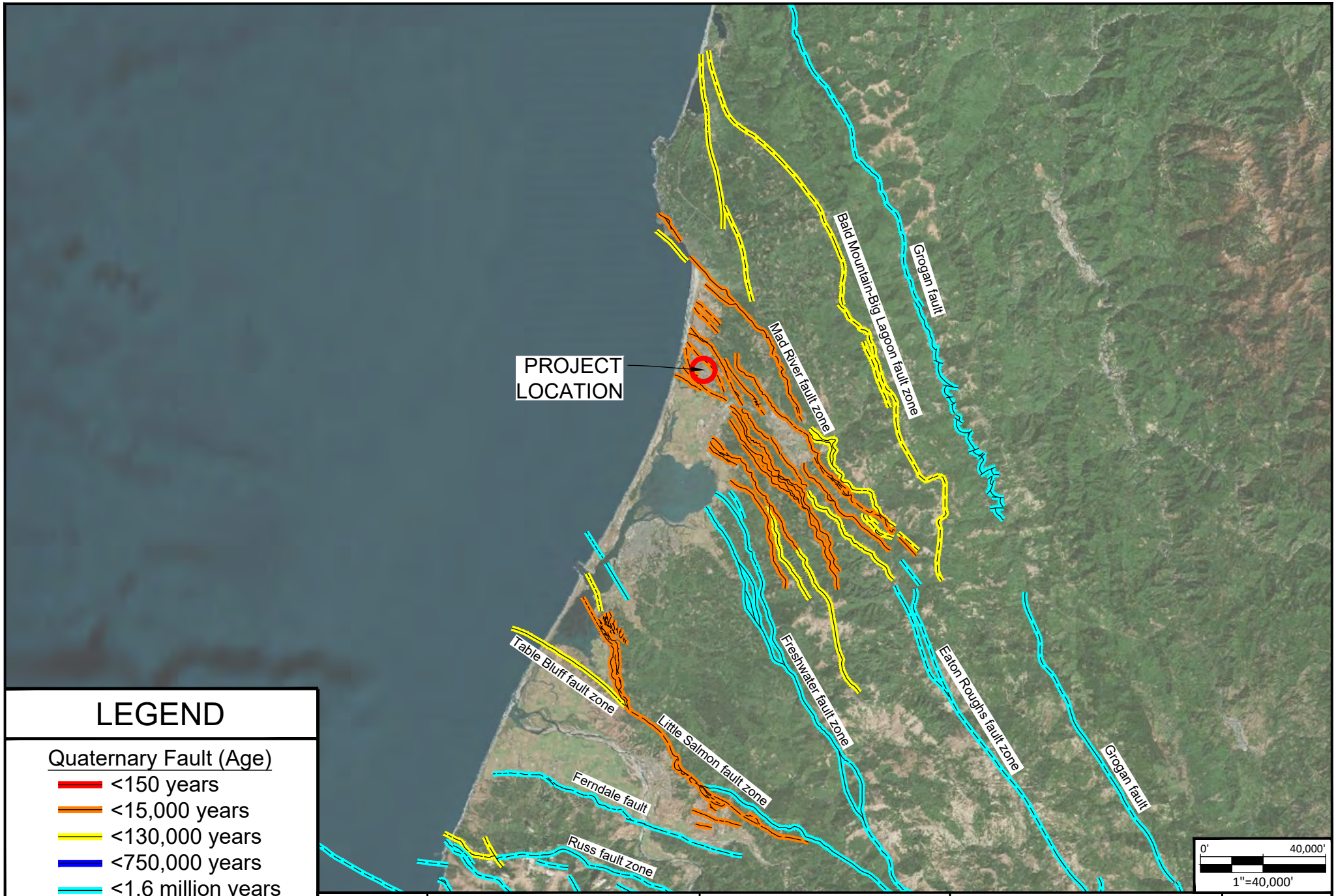
MCSD WATER & SEWER MAIN REPLACEMENT

MCKINLEYVILLE, CA

Figure 3
Geologic Map

Prj. No: 20-640.2
Date: 2/1/2022



LEGEND

Quaternary Fault (Age)

- <150 years
- <15,000 years
- <130,000 years
- <750,000 years
- <1.6 million years

Location

- Well Constrained
- Moderately Constrained
- Inferred

NORTH

Source:
Basemap: AutoCAD Civil3D Geolocation Tool, using Bing Maps

Fault Data: USGS GIS Data

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MCSD WATER & SEWER MAIN REPLACEMENT

MCKINLEYVILLE, CA

Figure 4
Fault Map

Prj. No: 20-640.2
Date: 2/1/2022

APPENDIX II

Boring Log Legend
Boring Logs

GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic / Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435)
CL	Collapse Potential (ASTM D 4546)
CP	Compaction Curve (CTM 216)
CR	Corrosion, Sulfates, Chlorides (CTM 643, CTM 417, CTM 422)
CU	Consolidated Undrained Triaxial (ASTM D 4767)
DR	Drained Residual Shear Strength (ASTM D 6467)
DS	Direct Shear (ASTM D 3080)
EI	Expansion Index (ASTM D 4829)
M	Moisture Content (ASTM D 2216)
OC	Organic Content (ASTM D 2974)
P	Permeability (CTM 220)
PA	Particle Size Analysis (ASTM D 422)
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89, AASHTO T 90)
PL	Point Load Index (ASTM D 5731)
PM	Pressure Meter
R	R-Value (CTM 301)
SE	Sand Equivalent (CTM 217)
SG	Specific Gravity (AASHTO T 100)
SW	Swell Potential (ASTM D 4546)
UC	Unconfined Compression - Soil (ASTM D 2166) Unconfined Compression - Rock (ASTM D 7012-C)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850)
UW	Unit Weight (ASTM D 7263)

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- Standard California Sampler (ID 2.5 in.)
- Modified California Sampler (ID 2.0 in.)
- Shelby Tube
- Piston Sampler
- NX Rock Core
- HQ Rock Core
- Bulk Sample
- Other (see remarks)

DRILLING METHOD SYMBOLS

- Auger Drilling
- Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

WATER LEVEL SYMBOLS

- First Water Level Reading (during drilling)
- Static Water Level Reading (short-term)
- Static Water Level Reading (long-term)

REFERENCE: Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010) with Errata Sheet (2015).

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Boring Record Legend

Soil Legend

CONSISTENCY OF COHESIVE SOILS				
Descriptor	**Unconfined Compressive Strength (tsf)**	**Pocket Penetrometer (tsf)**	**Torvane (tsf)**	**Field Approximation**
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS	
Descriptor	**SPT N_{60} (blows / 12 inches)**
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

MOISTURE	
Descriptor	**Criteria**
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS	
Descriptor	**Criteria**
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE		
Descriptor		**Size**
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS	
Descriptor	**Criteria**
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION	
Descriptor	**Criteria**
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

REFERENCE: Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010).

LOG OF BORING A-22-001

PROJECT NO: 20-640.2
PROJECT: MCSD Central Ave Water and Sewer Main
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: YYG
DEPTH OF BORING: 21.50 (ft)

BEGIN DATE: 01/10/2022
COMPLETION DATE: 01/10/2022
SURFACE ELEVATION:
SURFACE CONDITION: Paved
WATER DEPTH: 12.5 ft
READING TAKEN: 01/10/22
HAMMER EFFICIENCY: N/A

DRILLING CONTRACTOR: Clear Heart Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: DR10K (Truck)
HAMMER TYPE: Automatic; 140 lbs; 30 in. drop
SAMPLER TYPE & SIZE: MCAL (2.4" ID)
BOREHOLE DIAMETER: 4.0 in.
BACKFILL METHOD: Neat Cement Grout

FIELD								LABORATORY								
ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTIC LIMIT	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
								ASPHALT CONCRETE(6")									AC = 6.0 "
-1	1							AGGREGATE BASE(10")									AB = 10.0 "
-2	2							CLAYEY SAND (SC); medium dense; brown; moist; mostly fine SAND; little fines (Qm).									
-3	3		1	4 6 6	12				100								
-4	4																Soil pH: 4.93
-5	5																Min. Resistivity: 8,840 ohm-cm
-6	6		2	6 8 14	22				100				15.0	110.2	26		Chloride: 7.1 ppm Sulfate: 3.4 ppm Redox Potential: (+) 391 mv
-7	7																Sulfides Presence: Negative
-8	8		3	6 11 13	24				100								
-9	9																
-10	10																
-11	11		4	7 8 10	18												
-12	12							SANDY lean CLAY (CL); yellowish brown; moist to wet; mostly fines; some fine SAND (Qm).									
-13	13		5	9 10 8	18				0								
-14	14																
-15	15							Poorly-graded SAND with CLAY (SP-SC); medium dense; gray; wet; mostly fine SAND; few fines (Qm).									
-16	16		6	9 8 9	17				100								
-17	17																
-18	18		7	12 18 22	40			dense	89								
-19	19																
-20	20																
-21	21		8	12 17 21	38			brown	89								
-22	22							Bottom of borehole at 21.5 ft bgs									
-23	23																
-24	24																

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Sacramento, CA 95831
(916) 455-4225

PROJECT NO: 20-640.2
PROJECT: MCSD Central Ave Water and Sewer Main
BORING: A-22-001
ENTRY BY: OMR
CHECKED BY:

LOG OF BORING A-22-002

PROJECT NO: 20-640.2
PROJECT: MCSD Central Ave Water and Sewer Main
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: YYG
DEPTH OF BORING: 21.50 (ft)

BEGIN DATE: 01/10/2022
COMPLETION DATE: 01/10/2022
SURFACE ELEVATION:
SURFACE CONDITION: Paved
WATER DEPTH: 15.4 ft
READING TAKEN: 01/10/22
HAMMER EFFICIENCY: N/A

DRILLING CONTRACTOR: Clear Heart Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: DR10K (Truck)
HAMMER TYPE: Automatic; 140 lbs; 30 in. drop
SAMPLER TYPE & SIZE: MCAL (2.4" ID), SPT (1.4" ID)
BOREHOLE DIAMETER: 4.0 in.
BACKFILL METHOD: Neat Cement Grout

FIELD								LABORATORY								
ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTIC LIMIT	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
								ASPHALT CONCRETE(6")									AC = 6.0 "
-1	1							AGGREGATE BASE(10")									AB = 10.0 "
-2	2							CLAYEY SAND with GRAVEL (SC); medium dense; dark gray; moist; mostly fine SAND; little GRAVEL; little fines (Qm).									
-3	3		1	6 7 7	14				100								
-4	4																
-5	5							CLAYEY SAND (SC); medium dense; grayish light brown; moist; mostly fine SAND; little fines (Qm).									
-6	6		2	3 4 4	8				100		19	31					
-7	7																
-8	8		3	2 3 5	8			loose	100								
-9	9																
-10	10																
-11	11		4	5 5 6	11			medium dense; brown; moist to wet	100								
-12	12																
-13	13		5	7 14 17	31				83								
-14	14																
-15	15																
-16	16		6	3 4 8	12			wet	100								
-17	17																
-18	18																
-19	19																
-20	20		7	3 4 5	9			gray	61								
-21	21																
-22	22							Bottom of borehole at 21.5 ft bgs									
-23	23																
-24	24																

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PROJECT NO: 20-640.2
PROJECT: MCSD Central Ave Water and Sewer Main
BORING: A-22-002
ENTRY BY: OMR
CHECKED BY: RCG

LOG OF BORING A-22-003

PROJECT NO: 20-640.2
PROJECT: MCSD Central Ave Water and Sewer Main
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: YYG
DEPTH OF BORING: 16.50 (ft)

BEGIN DATE: 01/10/2022
COMPLETION DATE: 01/10/2022
SURFACE ELEVATION:
SURFACE CONDITION: Paved
WATER DEPTH: Not Encountered
READING TAKEN: N/A
HAMMER EFFICIENCY: N/A

DRILLING CONTRACTOR: Clear Heart Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: DR10K (Truck)
HAMMER TYPE: Automatic; 140 lbs; 30 in. drop
SAMPLER TYPE & SIZE: MCAL (2.4" ID), SPT (1.4" ID)
BOREHOLE DIAMETER: 4.0 in.
BACKFILL METHOD: Neat Cement Grout

FIELD								LABORATORY							
ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTIC LIMIT	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
								ASPHALT CONCRETE(6")									AC = 6.0"
-1	1							AGGREGATE BASE(10")									AB = 10.0"
-2	2							CLAYEY SAND (SC); medium dense; brown; moist; mostly fine SAND; little fines (Qm).									
-3	3		1	3 5 7	12				100								
-4	4																
-5	5		2	4 5 9	14				100								
-6	6												26.3	95.5			
-7	7																
-8	8		3	3 4 9	13				100						25		
-9	9																
-10	10																
-11	11		4	6 9 18	27				100								
-12	12																
-13	13		5	9 10 10	20			moist to wet	100								
-14	14																
-15	15		6	5 3 7	10			loose; wet	94								
-16	16																
-17	17							Bottom of borehole at 16.5 ft bgs									
-18	18																
-19	19																
-20	20																
-21	21																
-22	22																
-23	23																
-24	24																

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PROJECT NO: 20-640.2
PROJECT: MCSD Central Ave Water and Sewer Main
BORING: A-22-003
ENTRY BY: OMR
CHECKED BY: RCG

LOG OF BORING A-22-004

PROJECT NO: 20-640.2
PROJECT: MCSD Central Ave Water and Sewer Main
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: YYG
DEPTH OF BORING: 16.50 (ft)

BEGIN DATE: 01/10/2022
COMPLETION DATE: 01/10/2022
SURFACE ELEVATION:
SURFACE CONDITION: Paved
WATER DEPTH: Not Encountered
READING TAKEN: N/A
HAMMER EFFICIENCY: N/A

DRILLING CONTRACTOR: Clear Heart Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: DR10K (Truck)
HAMMER TYPE: Automatic; 140 lbs; 30 in. drop
SAMPLER TYPE & SIZE: MCAL (2.4" ID), SPT (1.4" ID)
BOREHOLE DIAMETER: 4.0 in.
BACKFILL METHOD: Neat Cement Grout

FIELD									LABORATORY							
ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTIC LIMIT	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
0	0							ASPHALT CONCRETE(6")									AC = 6.0"
-1	1							AGGREGATE BASE(10")									AB = 10.0"
-2	2							CLAYEY SAND (SC); medium dense; brown; moist; mostly fine SAND; some fines (Qm).									
-3	3		1	7 7 10	17				100								
-4	4																
-5	5		2	5 6 9	15				100								
-6	6												20.9	107.8	38		
-7	7																
-8	8		3	10 14 17	31				100								
-9	9																
-10	10		4	5 5 9	14			yellowish brown; moist to wet	100								
-11	11																
-12	12																
-13	13		5	8 12 21	33				100								
-14	14																
-15	15		6	10 12 12	24				100								
-16	16																
-17	17							Bottom of borehole at 16.5 ft bgs									
-18	18																
-19	19																
-20	20																
-21	21																
-22	22																
-23	23																
-24	24																

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PROJECT NO: 20-640.2
PROJECT: MCSD Central Ave Water and Sewer Main
BORING: A-22-004
ENTRY BY: OMR
CHECKED BY: RCG

APPENDIX III

Laboratory Test Results

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: Mckinleyville CSD RWP
CAInc File No: 20-640.2
Date: 2/2/2022
Technician: LAD

MOISTURE-DENSITY TESTS - D2216/D7263

	1	2	3	4	5
Sample No.	A-22-001-2A	A-22-003-2A	A-22-004-2A		
USCS Symbol	SC	SC	SC		
Depth (ft.)	6	6	6		
Sample Length (in.)	5.983	5.971	5.989		
Diameter (in.)	2.386	2.404	2.378		
Sample Volume (ft^3)	0.01548	0.01568	0.01539		
Total Mass Soil+Tube (g)	1168.4	1130.6	1185.6		
Mass of Tube (g)	278.8	272.6	275.7		
Tare No.	2004	G4	2030		
Tare (g)	125.9	13.5	128.2		
Wet Soil + Tare (g)	453.3	82.6	403.1		
Dry Soil + Tare (g)	410.7	68.2	355.6		
Dry Soil (g)	284.8	54.8	227.4		
Water (g)	42.6	14.4	47.5		
Moisture (%)	**15.0**	**26.3**	**20.9**		
Dry Density (pcf)	**110.2**	**95.5**	**107.8**		

Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: Mckinleyville CSD RWP
CAInc File No: 20-640.2
Date: 2/3/2022
Technician: LAD

200 Wash - ASTM D1140

Method A

Max Particle Size (100% Passing)	Standard Sieve Size	Recommended Min Mass of Test Specimens
2 mm or less	No. 10	20 g
4.75 mm	No. 4	100 g
9.5 mm	3/8 "	500 g
19.0 mm	3/4 "	2.5 kg
37.5 mm	1 1/2 "	10 kg
75.0 mm	3 "	50 kg

Table from 6.2 of ASTM D1140

Sample No.	A-22-001-2A	A-22-003-3B	A-22-004-2A		
USCS Symbol	SC	SC	SC		
Depth (ft.)	6	8	6		
Tare No.	2004	2021	2030		
Tare (g)	125.9	125.7	128.2		
Dry Soil + Tare (g)	410.74	326.4	355.6		
Dry Mass before (g)	284.8	200.7	227.4		
Dry Mass after (g)	210.7	150.5	140.2		
Percent Fines (%)	26	25	38		

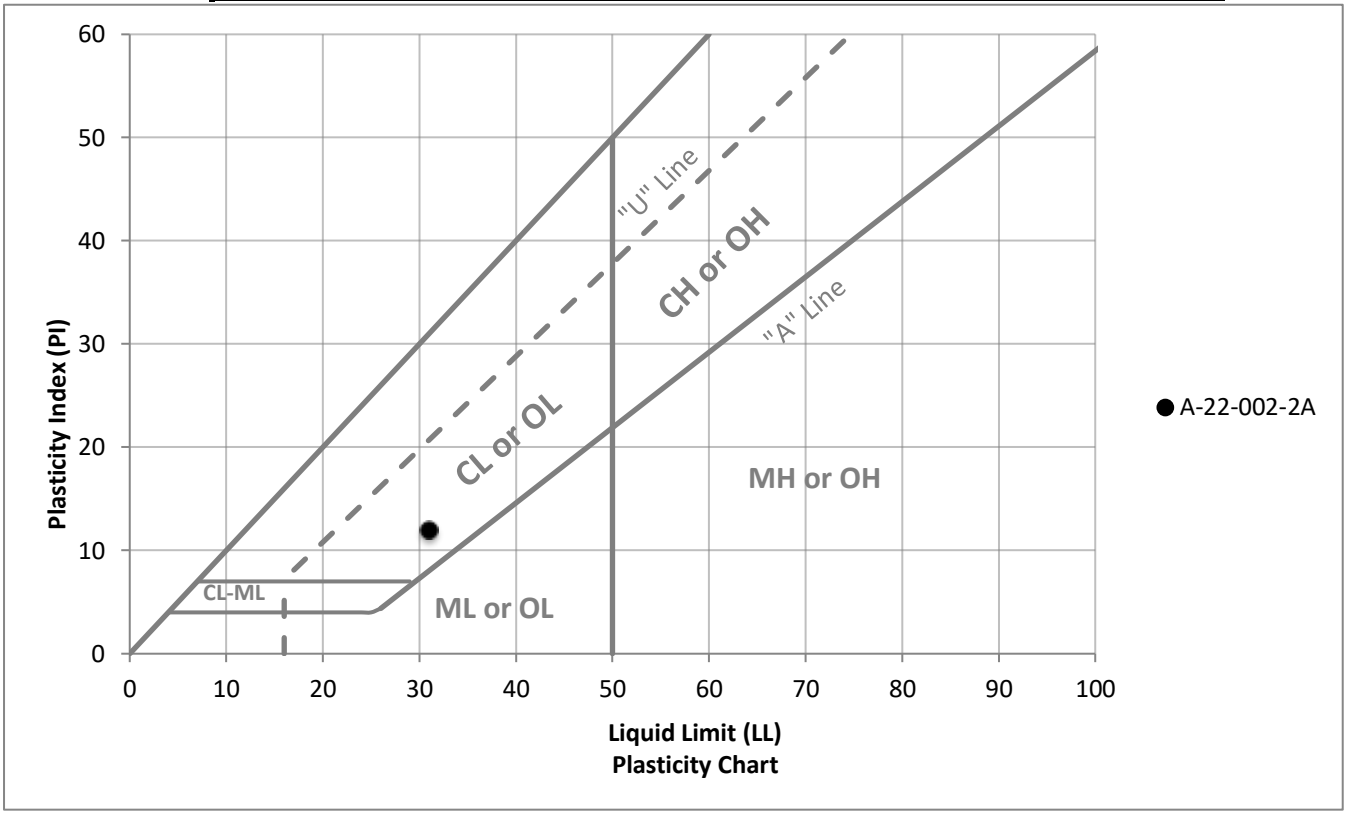
Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: Mckinleyville CSD RWP
CAInc File No: 20-640.2
Date: 2/9/2022
Technician: LAD

Plasticity Index - ASTM D4318

Sample ID	Depth (ft)	Liquid Limit	Plastic Limit	PI
A-22-002-2A	6	31	19	12



APPENDIX B
DRAFT HUMBOLDT COUNTY ENCROACHMENT PERMIT

DEPARTMENT OF PUBLIC WORKS
COUNTY OF HUMBOLDT
MAILING ADDRESS: 1106 SECOND STREET, EUREKA, CA 95501-0579
AREA CODE 707

Public Works Building
Second & L St., Eureka
Fax 445-7409

Clark Complex
Harris & H St., Eureka
Fax 445-7388

On-line
Web: humboldtgov.org

Administration	445-7491	Natural Resources	445-7741
Business	445-7652	Natural Resource Planning	267-9542
Engineering	445-7377	Parks	445-7651
Facility Management	445-7621	Roads	445-7421
Land Use	445-7205		

ENCROACHMENT PERMIT DRAFT FOR BID PURPOSES

PERMIT NO. EP 21110

PERMITTEE: **MCKINLEYVILLE COMMUNITY SERVICES DISTRICT**
1656 SUTTER RD
MCKINLEYVILLE, CA 95519

CONTRACTOR:

DATE ISSUED:
EXPIRATION:

DATES ADDED AFTER SIGNATURE

In response to your request received 12/16/2020 and subject to all the terms, conditions, and restrictions written below or printed as general or special provisions on any part of this form and/or attachments, permission is hereby granted, as per the attached special and general provisions and the Humboldt County Code Title IV, Division 1, pertaining to the protection and control of County roads, to perform the following work:

To trench and rehabilitate 6" and 8" sewer mains, 4" sewer laterals, manholes and to install new 16" and 8" water mainline all within COUNTY rights of ways on Central Avenue (A4L800) between Sutter Road (C4L810) and Hiller Road (C3L080).

All work shall be performed to COUNTY standards found in County Code Section 411.

Note: Final trench pavement patch shall extend *a minimum* of 6" beyond each edge of trench (See Item 2.2j).

If any conflicts occur between this permit and the submitted plans, the conditions of this permit shall prevail.

ALL WORK AUTHORIZED BY THIS PERMIT SHALL BE PERFORMED BY AN "A" LICENSED CONTRACTOR

This permit is revocable, at the discretion of the Department of Public Works (hereinafter referred to as COUNTY), upon written notice by US mail to the address of PERMITTEE subject to nonconformance of this permit.

In accordance with the California Streets and Highways Code, §1463: All Permits are revocable on five days' notice and the encroachment must be removed or relocated as may be specified by the road commissioner in the notice revoking the permit and within a reasonable time specified by the road commissioner unless the permit provides a specified time.

1.0 GENERAL REQUIREMENTS:

1.1 All work within COUNTY'S right of way shall be performed by **Contractor to be determined. (hereinafter referred to as CONTRACTOR)** in accordance with preliminary submittal plans by GHD. dated 10-03-2022 for the McKinleyville Community Services District, (hereinafter referred to as DISTRICT). **Construction plans are required for issuance of permit**. If any conflicts occur between DISTRICT submitted plans and the special or general conditions of this Encroachment Permit, the special and general conditions shall prevail.

PRELIMINARY DRAFT

PROJECT # 850500

1.2 CONTRACTOR shall submit to COUNTY the following document **prior** to conducting any work within COUNTY right of way for said project:

CONTRACTOR, at own expense, agrees to obtain and maintain policies of insurance as specified in Attachment "1", "Insurance Requirements" from the COUNTY RISK MANAGER.

1.3 All required inspections by COUNTY shall be scheduled by CONTRACTOR a minimum of forty-eight (48) hours (two County business days) in advance of the inspection. Inspection requests shall be made to Humboldt County Department of Public Works at 445-7205. COUNTY inspections will be required, at a minimum, during the following phases of construction:

a. An inspection prior to any excavation to assure the protection of all COUNTY maintained facilities.
b. An inspection after trench excavation adjacent to or exposing COUNTY storm drain structures and prior to placement of any DISTRICT facilities adjacent to COUNTY storm drain structures.
c. An inspection before placement of road structural section.
d. Any and all other construction activities within COUNTY right of way requested by COUNTY.
e. A final inspection of all improvements within COUNTY right of way shall be held prior to issuance of a notice of completion.

1.4 All affected utilities shall be contacted prior to any excavation work. CONTRACTOR shall notify U.S.A. - Underground Service Alert at 1-800-227-2600.

Any utility conflicts encountered during construction shall be forwarded to COUNTY, DISTRICT, and CONTRACTOR for resolution.

Note that COUNTY does not participate in the U.S.A. program. Therefore CONTRACTOR is responsible to research, locate, and protect any COUNTY maintained facilities that may be within the work area. Contact Public Works - Roads Division (445-7421) for assistance locating County maintained facilities. Typically these facilities include, but are not limited to, storm drain structures, traffic signal loop detectors, and traffic signal conduit.

1.5 During construction, roadways shall be periodically cleaned of mud, soil, rock, and debris and as directed by COUNTY.

1.6 CONTRACTOR shall be responsible to correct any involved drainage problems to the satisfaction of COUNTY.

1.7 CONTRACTOR shall minimize the transport of sediment to drainage courses during construction. COUNTY Inspector shall be notified by CONTRACTOR for review and approval of installed erosion control measures.

1.8 No work is authorized under this permit during wet weather periods, as determined by COUNTY, without submittal and approval by COUNTY of an erosion and sediment control plan. The plan shall be implemented for construction activities conducted between October 15 and April 15. It shall be at the discretion of the Department of Public Works to authorize work within COUNTY right of way during said period of time.

1.9 Relocation of signs and utilities shall be at CONTRACTOR'S expense. COUNTY shall relocate all necessary traffic signs to meet current specifications. CONTRACTOR shall provide COUNTY 48 hours (two County business days) advance notice of when sign relocation is needed.

1.10 This permit shall be valid until expiration date and shall be subject to periodic review by COUNTY and any preceding requirements may be revised by COUNTY whenever modifications or additional requirements are deemed necessary to protect COUNTY right of way and/or safety of the traveling public.

1.11 CONTRACTOR shall provide public notification regarding construction work scheduling and possible traffic delays to the following entities 48 hours (2 working days) prior to start of construction:

a. Humboldt County Sheriff's Department
b. California Highway Patrol

PRELIMINARY DRAFT

c. Cal-Fire (California Department of Forestry)
d. US Post Office
e. Local Ambulance Service(s)
f. Local Fire Response Agency
g. Local residents and vehicle traffic

CONTRACTOR shall coordinate construction activities with affected schools to ensure minimal delays in school bus routes, if applicable.

1.12 CONTRACTOR is responsible for preservation and/or perpetuation of all existing monuments which control subdivisions, tracts, boundaries, streets, highways, or other rights-of-way, easements or provide survey control which will be disturbed or removed due to CONTRACTOR'S work. CONTRACTOR shall provide a minimum of ten (10) working days notice to project engineer/surveyor prior to possible disturbance or removal of existing monuments. CONTRACTOR shall coordinate with Project engineer/surveyor to reset monuments or provide permanent witness monuments and file the required documentation with the COUNTY Surveyor pursuant Business and Professions Code Section 8771.

If centerline of trench is closer than seven feet (7') from monument, CONTRACTOR shall call COUNTY Surveyor (445-7205). CONTRACTOR may be required to consult with a licensed surveyor to set reference points and file a Corner Record.

1.13 Hours of operation for construction shall be Monday through Friday, during daylight hours for a maximum of 6:30 a.m. to 6:00 p.m. during the longer daylight season. Weekend operation may be acceptable to COUNTY, provided COUNTY is notified a minimum of forty-eight (48) hours (two County business days) in advance and agrees to the weekend operation.

1.14 All administration and inspection services rendered in connection with the work covered by this permit shall be paid for by DISTRICT in accordance with the latest Humboldt County Schedule of Fees and Charges for Permits and Services adopted by the Board of Supervisors. Upon acceptance by COUNTY of all work authorized under this permit, a bill will be prepared and sent to DISTRICT for reimbursement of COUNTY costs.

1.15 By applying for and obtaining this permit pursuant to Humboldt County Code Chapter 1, Title IV, Division 1, DISTRICT/CONTRACTOR agree that, if DISTRICT/CONTRACTOR fail to comply with the terms of this permit or to perform or complete the work according to the plans, COUNTY or State standard specifications, or fail to comply with any provisions of Chapter 1, COUNTY may elect to perform and complete the work by any method the Director of the Humboldt County Department of Public Works deems appropriate. DISTRICT/CONTRACTOR shall reimburse COUNTY for the full cost, at the then current Associated General Contractor's Cost Schedule, for such work, of performing and completing the work according to this permit.

1.16 DISTRICT/CONTRACTOR shall comply with Permit General Provisions, Public Safety, and Hold Harmless/Indemnification Handout (Attachment "3").

1.17 Any damage to existing COUNTY road improvements (i.e., adjacent curb and gutter, drainage structures, road surface, etc.) shall be repaired or replaced by CONTRACTOR to the satisfaction of the Department of Public Works. Damages shall be promptly reported to the Department of Public Works.

2.0 SPECIFIC REQUIREMENTS:

2.1 Traffic Control

a. CONTRACTOR shall be responsible for all traffic control and public safety at work locations in COUNTY right of way in a manner satisfactory to COUNTY. This shall include working and non-working days and hours.

Traffic control operations shall conform to **California Manual on Uniform Traffic Control Devices for Streets and Highways** (FHWA's MUTCD 2009 Edition, as amended for use in California), March 27, 2020, or latest edition, and to the satisfaction of COUNTY. Warning and

PRELIMINARY DRAFT

flagging of motorists at work locations shall be conducted ***AT ALL TIMES*** by properly trained personnel.

- CONTRACTOR shall use current revisions of Caltrans 2018 Standard Plan T13 with T9 for a traffic control plan, when applicable, for closing one traffic lane – see Attachment "4".
- CONTRACTOR shall use CAMUTCD Figure 6H-6, Titled "Shoulder Work with Minor Encroachment (TA-6)", when applicable, for working outside of the travelway and not affecting normal vehicle traffic – see Attachment "4".
- Conditions requiring a traffic control plan other than Caltrans T13 with T9 or Fig 6H-6 will require submittal and Public Works approval of a traffic control plan prepared by a Registered Civil Engineer (or Traffic Engineer).

b. Warning and flagging of motorists at work locations shall be conducted ***AT ALL TIMES*** by properly trained personnel.

c. Only one (1) lane of traffic shall be closed at any time during construction or installation. ***NO COMPLETE ROAD CLOSURE*** is authorized under this permit.

d. Should CONTRACTOR request the complete closure or closure of a portion of a COUNTY maintained road, CONTRACTOR must submit to COUNTY a road closure plan a minimum of five (5) County business days for review. Revisions to the road closure plan shall be made as necessary to obtain approval from COUNTY. Road closure shall conform to the COUNTY approved plan.

e. Property owners shall be able to use their driveways when needed. DISTRICT and/or CONTRACTOR shall notify residents along the affected streets that their driveways will be obstructed. Said obstructions shall not exceed eight (8) hours. CONTRACTOR shall provide COUNTY 24 hours (1 working day) advance notice before work is to be performed.

2.2 **Trenching and Trench Requirements:**

a. CONTRACTOR shall be responsible for locating all substructures. Any damages to existing utilities are the responsibility of CONTRACTOR.

b. Prior to commencement of any work, CONTRACTOR/DISTRICT shall submit a construction activity permit issued by CalOSHA for trenches or excavations which are five feet (5') or deeper and into which a person is required to descend.

c. All underground lines shall be placed a minimum of thirty inches (30") below finish road grade. All new underground lines shall be placed a minimum of one foot (1') below all drainage structures. DISTRICT and/or CONTRACTOR shall be responsible for locating all substructures. Any damages are the responsibility of the DISTRICT.

d. All valve covers, manhole covers, sewer clean out covers, and monument well covers shall be raised to grade to the satisfaction of COUNTY.

e. All work areas in or adjacent to the COUNTY roadway shall be properly barricaded and protected after working hours. **No open trenches** within COUNTY right of way shall be allowed during non-working hours.

f. Excavations by CONTRACTOR **in or** adjacent to traffic lanes that remain open after working hours shall be plated with steel plates suitable for traffic loading and **shall be** made drivable with asphalt cold mix approach ramps. Construction equipment and project materials shall not be used to protect open trenches. **Bump signs (W8-1) shall be placed to notify vehicular traffic in advance of any steel plates that remain in traffic lanes after work hours.** Construction equipment and project materials shall not be stored within COUNTY right of way without approval from COUNTY.

PRELIMINARY DRAFT

g. The areas that require permanent pavement restoration for trenches excavated across or parallel to existing paved traveled way section of COUNTY roads or areas disturbed by the project shall be restored as delineated on the attached **"Type I or Type II"** Trench Typical (Attachment "2") and/or as directed by the County Inspector. Temporary pavement shall be removed from all trenches prior to placing permanent paving. Trenches shall be sawcut a minimum of six inches (6") beyond the asphalt concrete disturbed by trench excavation or the edge of the area disturbed by the project, as determined by COUNTY, just prior to placing permanent paving. The finish paving SHALL NOT BE CROWNED across the trench section and **shall be placed no later than thirty (30) days after initial trench closure.**

h. Backfill material in all trenches shall conform to Section 19 of Caltrans Standard Specifications dated 2015. The attached Standard **Trench Details "Type I or Type II"** (Attachment "2") **shall be used.** Backfill material, Class II aggregate base, shall be placed to the subgrade of the pavement in uniform layers and shall be brought up uniformly on all sides of the structure or facility. Backfill material shall be mechanically compacted to a relative compaction of not less than 95% in the top 2.5 feet of the trench, with a minimum of 90% relative compaction below that point to the top of any conduit or pipe located within the traveled way and shoulder section of any COUNTY maintained road.

i. All trenches shall be temporarily capped with a minimum of two inches (2") of cold mix asphalt concrete prior to opening the roadway to public traffic. CONTRACTOR shall maintain all temporary paving in trenches until permanent paving has been completed.

j. **All trenches shall be cleanly sawcut a minimum of six inches (6") beyond the asphalt concrete disturbed by trench excavation or the edge of the area disturbed by the project, as determined by COUNTY, just prior to placing permanent paving.**

k. Permanent paving on all trenches shall consist of a minimum of three inches (3") of Caltrans specifications hot mix asphalt concrete. Temporary cold mix asphalt concrete shall be removed from all trenches prior to placing permanent paving. All trenches shall be inspected and approved by COUNTY prior to placing permanent paving.

l. Any asphalt concrete surface damaged by construction project shall be saw cut a minimum of six inches (6") beyond the damaged portion, removed, and resurfaced with a minimum of two inches (2") of Caltrans specifications hot mix asphalt concrete. Any temporary paving shall be removed from trench prior to placing final paving.

m. **CONTRACTOR, or his Designee, shall be responsible for performing compaction tests.** COUNTY reserves the right to perform as many additional compaction tests as it deems reasonably necessary to ensure that the compaction requirements are met. CONTRACTOR agrees by the start of construction authorized by this permit to reimburse COUNTY for costs of such tests. Said costs shall be in conformance with the adopted Humboldt County Schedule of Fees and Charges for Permits and Services.

n. **CONTRACTOR, at the time of completion, shall submit letter of acceptance of the project from DISTRICT.** DISTRICT shall be responsible to maintain all refilled trenches in perpetuity as per Humboldt County Code Title IV, Division 1, Chapter 1, Section 411-31-(c) pertaining to the protection and control of COUNTY roads. All trench failures shall be repaired by DISTRICT within a reasonable length of time, as determined by COUNTY after notification of said failure.

2.3 **Project Completion:**

a. All construction materials and debris shall be removed from within COUNTY right of way after project completion.

b. CONTRACTOR shall replace all pavement markings and striping removed by project. All pavement markings and re-striping shall follow Caltrans 2015 standard plans.

PRELIMINARY DRAFT

c. All COUNTY signs shall be replaced in their original location if disturbed or temporarily moved during trenching.

d. Unless waived by COUNTY, for all underground installations, DISTRICT shall furnish COUNTY with legible, survey quality, as-built/record drawing plans upon completion and acceptance of the work by the facility Owner and prior to acceptance of the work by COUNTY. Two sets of as-built drawings shall be submitted upon approval by COUNTY: one set of wet stamped mylar sheets and one set of paper sheets. The as-built drawings shall be prepared by a registered civil engineer or licensed land surveyor; shall be drawn on 22"x34" sheets; shall be drawn to a standard engineering scale (1"=20', or 1"=40', etc.); and shall show the location of the improvements with respect to the existing road improvements and right of way.

e. CONTRACTOR shall provide a notice of completion to COUNTY.

3.0 AUTHORIZATIONS:

3.1 This permit shall not be executed by the Department of Public Works until certificates or other sufficient proof that these insurance provisions have been complied with are received by the Department of Public Works.

3.2 DISTRICT is responsible to obtain and comply with any other permits necessary for the project. Such permits may include, but are not limited to, those issued by County of Humboldt, Planning and Building Department; County of Humboldt, California Department of Fish and Game; State of California Department of Transportation (Caltrans); Army Corps of Engineers; etc.

3.3 **This permit is not valid until all other permits required for the project have been issued.** The Department of Public Works will issue a stop work order if work commences without all other required permits properly issued.

3.4 DISTRICT, or an authorized agent of DISTRICT for which this permit is issued, hereby recognizes and accepts the terms of this permit by authorized signature below.

PERMITTEE:

_____
Authorized signature

_____
Print name

Date _____

CONTRACTOR:

_____
Authorized signature

_____
Print name

Date _____

COUNTY OF HUMBOLDT BY:

_____
Erin Cearley, Engineering Technician

Land Use Division
3015 H Street
Eureka CA 95501
(707) 445-7205

cc: Denton Carrick, Road Crew Supervisor , Steve Finch, Road Superintendent, Roads Dispatch; Deputy Director-Roads

PROJECT # 850500

Attachments:
- Attachment "1" – Insurance
- Attachment "2" – Type I Trench Detail revised 04/22/2013, Type II Trench Detail revised 04/22/2013
- Attachment "3" – General Provisions, Public Safety, and Hold Harmless/Indemnification Handout
- Attachment "4" – 2014 CAMUTCD Figure 6H-6, Caltrans 2018 Standard Plans T9 and T13

PRELIMINARY DRAFT

INSURANCE REQUIREMENTS

THIS PERMIT SHALL NOT BE EXECUTED BY COUNTY and PERMITTEE/CONTRACTOR are not entitled to any rights, unless certificates of insurance, or other sufficient proof that the following provisions have been complied with, and such certificates(s) are filed with the Clerk of the Humboldt County Board of Supervisors.

Without limiting PERMITTEE/CONTRACTOR'S indemnification provided herein, PERMITTEE/CONTRACTOR shall and shall require any of its subcontractors to take out and maintain, throughout the period of this permit, the following policies of insurance placed with insurers with a current A.M. Bests rating of no less than A:VII or its equivalent against injury/death to persons or damage to property which may arise from or in connection with the activities hereunder of PERMITTEE/CONTRACTOR, its agents, employees, or subcontractors:

1. Comprehensive or Commercial General Liability Insurance at least as broad as Insurance Services Office Commercial General Liability coverage (occurrence form CG0001), in an amount of $2,000,000 per occurrence. If work involves explosive, underground or collapse risks, XCU must be included. If a general aggregate limit is used, either the general aggregate limit shall apply separately to this project or the general aggregate shall be twice the required occurrence limit. Said policy shall contain, or be endorsed with, the following provisions:

a. COUNTY, its officers, employees, and agents, are covered as additional insured for liability arising out of the operations performed by or on behalf of PERMITTEE/CONTRACTOR. The coverage shall contain no special limitations on the scope of protection afforded to COUNTY, its officers, agents, and employees.

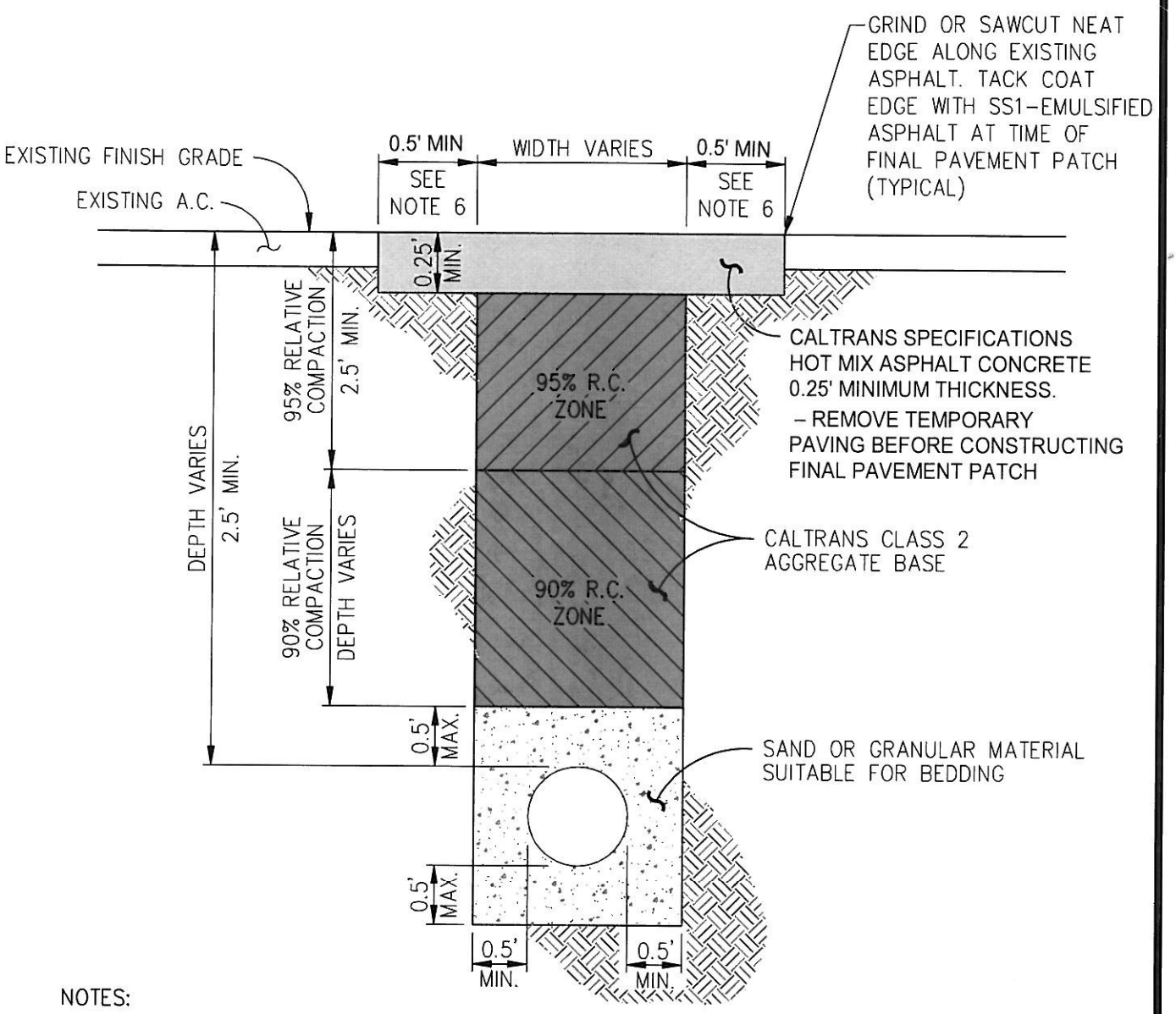
b. The policy shall not be canceled or materially reduced in coverage without thirty (30) days prior written notice (10 days for non-payment of the premium) to COUNTY by certified mail.

c. The inclusion of more than one insured shall not operate to impair the rights of one insured against another insured, and the coverage afforded shall apply as though separate policies had been issued to each insured, but the inclusion of more than one insured shall not operate to increase the limits of the insurer's liability.

d. For claims related to this project, PERMITTEE/CONTRACTOR'S insurance is primary coverage to COUNTY, and any insurance or self-insurance programs maintained by COUNTY are excess to PERMITTEE/CONTRACTOR"S insurance and will not be called upon to contribute with it.

2. Any failure to comply with reporting or other provisions of the parties, including breach of warranties, shall not affect coverage provided to COUNTY, its officers, employees and agents. PERMITTEE/CONTRACTOR shall furnish COUNTY with certificates and original endorsements effecting the required coverage prior to execution of this permit by COUNTY. The endorsements shall be on forms as approved by the County Risk Manager or County Counsel. Any deductible or self-insured retention over $100,000 shall be disclosed to and approved by COUNTY. If PERMITTEE/CONTRACTOR does not keep all required policies in full force and effect, COUNTY may, in addition to other remedies under this permit, take out the necessary insurance, and PERMITTEE/CONTRACTOR agree to pay the cost of said insurance. All coverage shall be with insurance carriers licensed and admitted to do business in California. All coverage shall be with insurance carriers acceptable to COUNTY.

Questions concerning insurance requirements shall be directed to the County Risk Manger at 707-268-3669.



NOTES:

1. THE TRENCH SHALL HAVE AT LEAST 0.25 FEET OF TEMPORARY COLD MIX ASPHALT BEFORE OPENING ROAD TO TRAFFIC.
2. FOR ITEMS NOT SHOWN, SEE ISSUED HUMBOLDT COUNTY ENCROACHMENT PERMIT.
3. ALL MATERIALS SHALL COMPLY WITH CALTRANS STANDARD SPECIFICATIONS, CURRENT EDITION.
4. IF GROUNDWATER IS ENCOUNTERED DURING TRENCH EXCAVATION, ENGINEER AND THE COUNTY DEPARTMENT OF PUBLIC WORKS SHALL BE CONSULTED FOR SITE SPECIFIC CORRECTIVE MEASURES.
5. **THE PERMITEE, OR ITS DESIGNEE, SHALL BE RESPONSIBLE FOR PERFORMING COMPACTION TESTS.** THE DEPARTMENT OF PUBLIC WORKS RESERVES THE RIGHT TO MAKE AS MANY COMPACTION TESTS AS IT DEEMS REASONABLE TO ENSURE THAT THE COMPACTION REQUIREMENTS ARE MET. PERMITTEE SHALL REIMBURSE THE DEPARTMENT OF PUBLIC WORKS FOR ALL COSTS ASSOCIATED WITH SUCH TESTS. SAID COSTS SHALL BE IN CONFORMANCE WITH THE HUMBOLDT COUNTY SCHEDULE OF FEES AND CHARGES FOR PERMITS AND SERVICES, AS ADOPTED BY THE BOARD OF SUPERVISORS.
6. WHEN EXISTING AC PAVEMENT IS LESS THAN 5 YEARS OLD, USE 9' MINIMUM.
   WHEN EXISTING AC PAVEMENT IS MORE THAN 5 YEARS OLD, USE 0.5' MINIMUM

NOTE: FIGURES HEREON ARE NOT DRAWN TO SCALE, UNLESS OTHERWISE NOTED.

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS
1106 SECOND STREET * EUREKA * CA * 95501
TEL (707) 445-7377 * FAX (707) 445-7409

TYPE I TRENCH DETAIL -AGGREGATE BASE BACKFILL-

STD DWG

ISSUED: 08/26/2009 REVISED 04/22/2013

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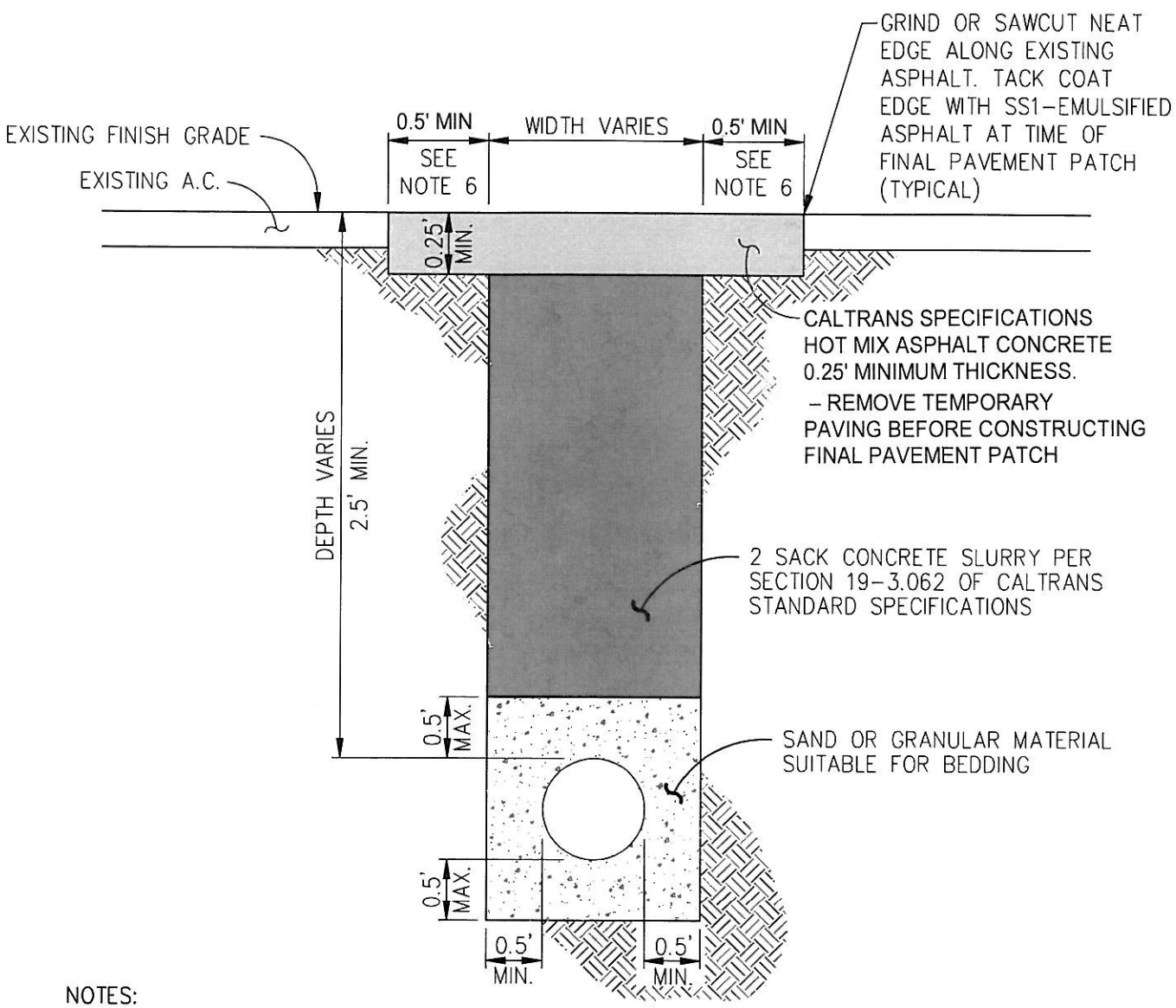
SHT 1 OF 1



NOTES:

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3. ALL MATERIALS SHALL COMPLY WITH CALTRANS STANDARD SPECIFICATIONS, CURRENT EDITION.
4. IF GROUNDWATER IS ENCOUNTERED DURING TRENCH EXCAVATION, ENGINEER AND THE COUNTY DEPARTMENT OF PUBLIC WORKS SHALL BE CONSULTED FOR SITE SPECIFIC CORRECTIVE MEASURES.
5. **THE PERMITEE, OR ITS DESIGNEE, SHALL BE RESPONSIBLE FOR PROVIDING CERTIFICATION OF MATERIALS TO THE COUNTY.** THE DEPARTMENT OF PUBLIC WORKS RESERVES THE RIGHT TO MAKE AS MANY MATERIAL ASSURANCE TESTS AS IT DEEMS REASONABLE TO ENSURE THAT THE CONSTRUCTION MATERIAL REQUIREMENTS ARE MET. PERMITTEE SHALL REIMBURSE THE DEPARTMENT OF PUBLIC WORKS FOR ALL COSTS ASSOCIATED WITH SUCH TESTS. SAID COSTS SHALL BE IN CONFORMANCE WITH THE HUMBOLDT COUNTY SCHEDULE OF FEES AND CHARGES FOR PERMITS AND SERVICES, AS ADOPTED BY THE BOARD OF SUPERVISORS.
6. WHEN EXISTING AC PAVEMENT IS LESS THAN 5 YEARS OLD, USE 9' MINIMUM.
   WHEN EXISTING AC PAVEMENT IS MORE THAN 5 YEARS OLD, USE 0.5' MINIMUM

NOTE: FIGURES HEREON ARE NOT DRAWN TO SCALE, UNLESS OTHERWISE NOTED.

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS
1106 SECOND STREET * EUREKA * CA * 95501
TEL (707) 445-7377 * FAX (707) 445-7409

TYPE II TRENCH DETAIL -CONCRETE SLURRY BACKFILL-

STD DWG

ISSUED: 08/26/2009 REVISED 04/22/2013

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SHT 1 OF 1

GENERAL PROVISIONS

DEFINITION - This permit is issued in accordance with the Encroachment Permit Ordinance #896 and any amendments thereof. This permit is revocable on notice by the Director of Public Works.

ACCEPTANCE OF PROVISIONS - It is understood and agreed by the Permittee that the doing of any work under this permit shall constitute an acceptance of the conditions and provisions relative to the permit.

NO PRECEDENT ESTABLISHED - This permit is granted with the understanding that this action is not to be considered as establishing any precedent on the question of the expediency of permitting any certain kind of encroachment to be erected within right of way of County highways.

NOTICE PRIOR TO STARTING WORK - The Department of Public Works shall be notified 24 hours in advance of pouring concrete to permit inspection of subgrade and forms.

KEEP PERMIT ON SITE - This permit shall be kept at the work site and must be shown to any representative of the Grantor or any law enforcement officer on demand.

PROTECTION OF TRAFFIC - Adequate provision shall be made for the protection of the traveling public. Barricades shall be placed with amber lights at night, also flagmen employed, all as may be required by the County for the particular work in progress.

MINIMUM INTERFERENCE WITH TRAFFIC - All work shall be planned and carried out so that there will be the least possible inconvenience to the traveling public.

STORAGE OF MATERIAL - No material shall be stored within 8 feet from the edge of pavement or graveled way or within the shoulder line when the shoulders are wider than 8 feet, unless specifically authorized by this permit.

CLEAN UP - Upon completion of the work, all brush, timber, scraps, and materials shall be entirely removed and the right of way left in as presentable a condition as before work started.

STANDARDS OF CONSTRUCTION - All work shall conform to the State of California Standard Specifications and County standards.

FUTURE MOVING OF INSTALLATION - It is understood by the Permittee that the installation authorized herein shall, upon demand of the Director of Public Works, be relocated by and at the sole expense of the Permittee whenever construction, reconstruction, or maintenance on the highway may require such relocation. The Permittee must complete such relocation within the time specified in said demand.

CARE OF DRAINAGE - Permittee shall undertake such measures to prevent interference with established drainage as may be required by the Director of Public Works.

EXCAVATION - All excavation shall comply with the provisions of Chapter 3, Article 2, Section 320, of the Encroachment Permit Ordinance #896.

BACKFILL - Backfill in all trenches shall comply with the provisions of Chapter 3, Article 2, Section 321, of the Encroachment Permit Ordinance #896.

LOCATION - The shallowest portion of any pipeline or other facility shall be installed not less than 30 inches below the roadway surface, or one foot below the flow line of any drainage structure, pipe, ditch, or creek.

CURB, GUTTERS, AND SIDEWALK - Shall comply with the provisions of Chapter 3, Article 3, of Encroachment Permit Ordinance #896 and any amendments thereof.

DEFAULT OF PERMITTEE - By applying for and obtaining a permit, the Permittee agrees that if the Permittee fails to comply with the terms of the Permit, the County may elect to perform and complete the work by any method the Director deems appropriate. The Permittee shall reimburse the County for the full cost of the work at the then current Associated General Contractor's Cost Schedule for such work. .

PUBLIC SAFETY

1. The Permittee in the conduct of work shall provide, erect, or maintain the lights, barriers, warning signs, and other safeguards necessary to protect the traveling public in accordance with Section 21406 of the California Vehicle Code. If at any time the Director of Public Works finds that suitable safeguards are not being provided, the County shall provide, erect, and/or maintain the safeguards deemed necessary. The Permittee shall reimburse the County for all expenses incurred by County providing, erecting, and maintaining the safeguards deemed necessary by the Director of Public Works.

2. All work shall be planned and carried out so that there will be the least possible inconvenience to the traveling public. Permittee is authorized to place flagmen to stop and warn traffic for necessary protection to public safety, but traffic shall not be unreasonably delayed. Complete closure of the road shall not be permitted unless authorized in writing by the Director of Public Works.

HOLD HARMLESS/INDEMNIFICATION

The Permittee shall agree to indemnify and hold harmless the County and each of its officers and employees from any liability or responsibility for accident, loss, or damage to persons or property arising by reason of the work done by the Permittee, or its agents, employees, or representatives. The Permittee shall, at its own expense, cost, and risk, defend any and all actions, suits, or other legal proceedings that may be brought or instituted against the County, its officers, or employees and pay or satisfy any judgment that may be rendered against the County and its officers or employees in any such action, suit, or legal proceedings arising by reason of the work done by the Permittee, its agents, employees, or representatives.

Notes for Figure 6H-6—Typical Application 6
Shoulder Work with Minor Encroachment

Guidance:

1. All lanes should be a minimum of 10 feet in width as measured to the near face of the channelizing devices.

2. The treatment shown should be used on a minor road having low speeds. For higher-speed traffic conditions, a lane closure should be used.

Option:

3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 feet may be used.
4. Where the opposite shoulder is suitable for carrying vehicular traffic and of adequate width, lanes may be shifted by use of closely-spaced channelizing devices, provided that the minimum lane width of 10 feet is maintained.
5. Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
6. Temporary traffic barriers may be used along the work space.
7. The shadow vehicle may be omitted if a taper and channelizing devices are used.
8. A truck-mounted attenuator may be used on the shadow vehicle.
9. For short-duration work, the taper and channelizing devices may be omitted if a shadow vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
10. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

11. Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.

12. Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.

13. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

Guidance:

14. All advance warning signs should be placed so that the path of travel for bicycles is not blocked, while maintaining visibility for road users.

15. When existing accommodations for bicycle travel are disrupted or closed in a long-term duration project (see Section 6G.02) and the roadway width is inadequate for allowing bicyclists and motor vehicles to travel side by side, the Bicycle Warning (W11-1) sign and the SHARE THE ROAD (W16-1P) plaque should be used to advise motorists of the presence of bicyclists in the travel way lanes.

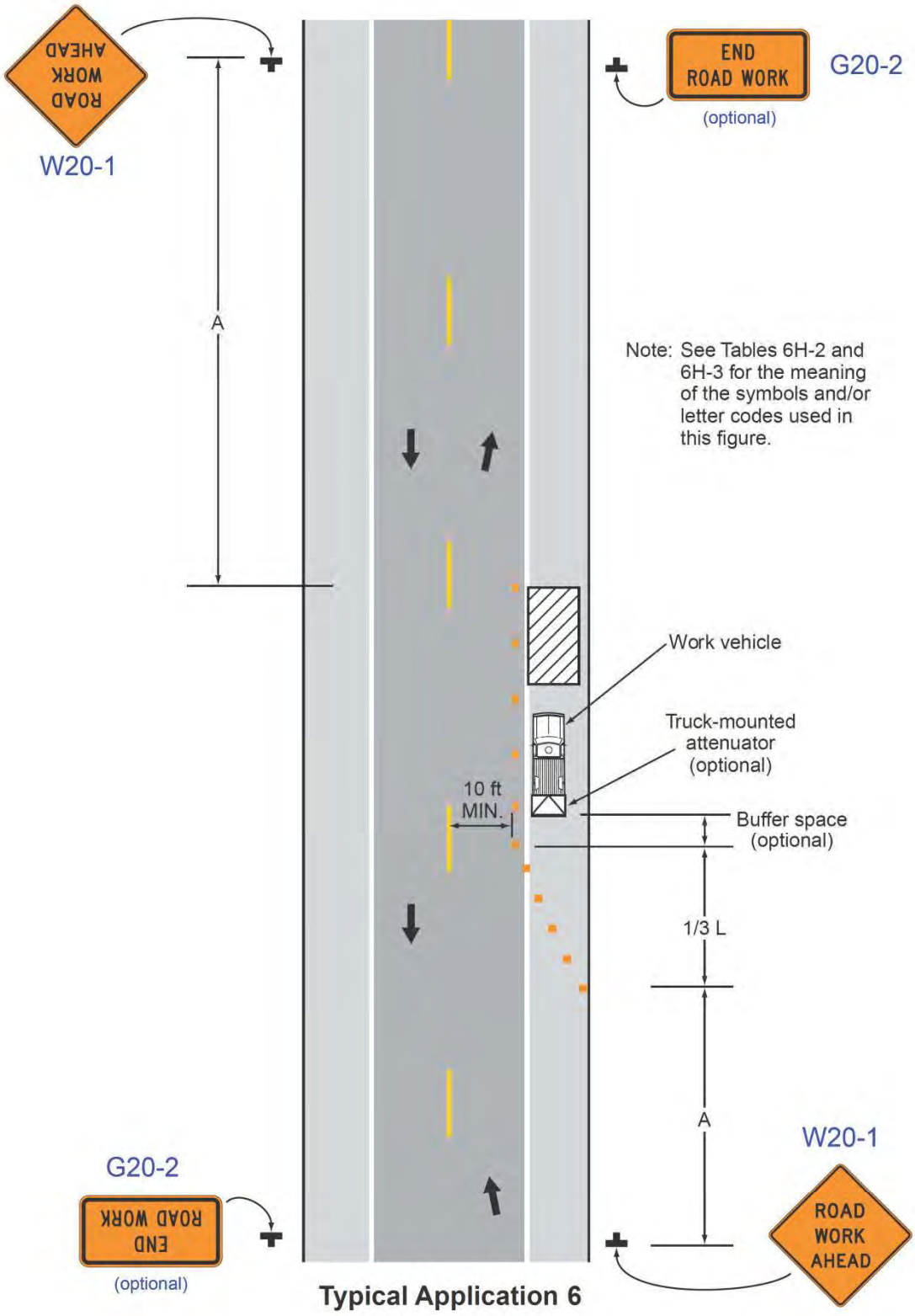
16. Except for short durations and mobile operations, when a highway shoulder is occupied and bicyclists would be sharing a lane with vehicular traffic, as a result of the TTC zone, speed reduction countermeasures should be used to reduce traffic speeds in the TTC zone. Refer to Sections 6C.01 and 6D.03.

17. Except for short durations and mobile operations, when a highway shoulder is occupied and bicyclists would be sharing a lane with vehicular traffic, as a result of the TTC zone, before narrowing the outside lane other measures such as widening the outside shoulder to allow bicyclists and motor vehicles to travel side by side through the TTC zone should be considered.

18. If traffic volumes make it feasible, the two left lanes should be merged into one lane to avoid using the shoulder as a traveled way lane and allowing continued use for emergency purposes and bicycle travel.

19. When existing accommodations for bicycle travel are disrupted or closed in a long-term duration project (see Section 6G.02) and the roadway width is inadequate for allowing bicyclists and motor vehicles to travel side by side, a separate path should be considered for bicyclists.

Figure 6H-6. Shoulder Work with Minor Encroachment (TA-6)



Typical Application 6

Table 6H-1(CA). Index to Typical Applications

Typical Application Description	Typical Application Number
Work affecting Pedestrian and Bicycle Facilities (see Section 6G.05)	
Shoulder Closure on Urban (Low Speed) Locations to Accommodate Bicyclists	TA-101(CA)
Lane Closure on Freeway, Expressway, Rural and Urban (High Speed) Locations to Accommodate Bicyclists	TA-102(CA)
Detour for Bike Lane on Roads with Closure of One Travel Direction	TA-103(CA)
Right Lane and Bike Lane Closure on Far Side of Intersection	TA-104(CA)
Work Within the Traveled Way of a Two-Lane Highway (see Section 6G.10)	
Lane Shift on Road with Low Traffic Volumes	TA-105(CA)

Table 6H-2. Meaning of Symbols on Typical Application Diagrams

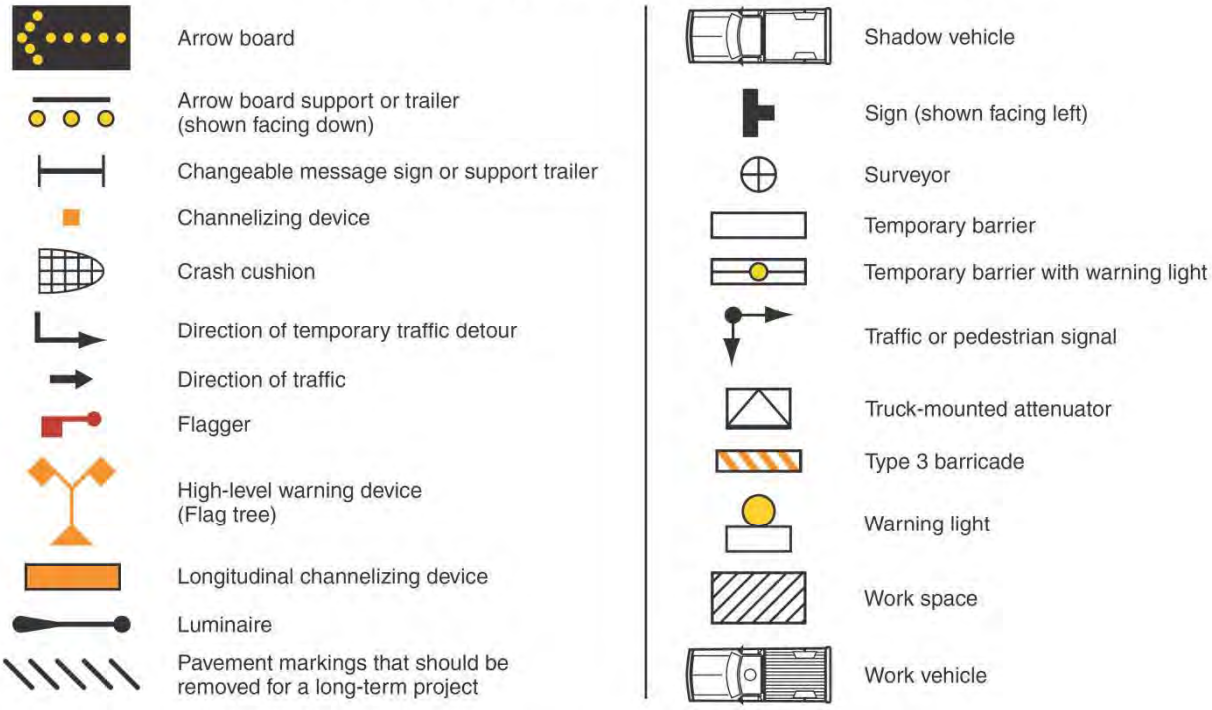


Table 6H-3. Recommended Advance Warning Sign ~~Minimum~~ Spacing

Road Type	Distance Between Signs**		
	A	B	C
Urban ~~(low speed)~~ - 25 mph or less***	100 feet	100 feet	100 feet
Urban - more than 25 mph to 40 mph***	250 feet	250 feet	250 feet
Urban ~~(high speed)~~ - more than 40 mph***	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet

* ~~Speed category to be determined by the highway agency.~~

** The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The "first sign" is the sign in a three-sign series that is closest to the TTC zone. The "third sign" is the sign that is furthest upstream from the TTC zone.)

*** Posted speed limit, off-peak 85th-percentile speed prior to work starting, or other anticipated operating speed in mph.

Table 6H-4. Formulas for Determining Taper Length

Speed (S)	Taper Length (L) in feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

Where: L = taper length in feet
W = width of offset in feet
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

Table 6H-4(CA). Taper Length Criteria for Temporary Traffic Control Zones (for 12 feet Offset Width)

Speed* S (mph)	Minimum Taper Length** for Width of Offset 12 feet (W)			
	Merging L (feet)	Shifting L/2 (feet)	Shoulder L/3 (feet)	Down Stream (feet)***
20	80	40	27	50
25	125	63	42	50
30	180	90	60	50
35	245	123	82	50
40	320	160	107	50
45	540	270	180	50
50	600	300	200	50
55	660	330	220	50
60	720	360	240	50
65	780	390	260	50
70	840	420	280	50
75	900	450	300	50

* - Posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph.

** - For other offsets use the following merging taper length formula for L:

For speeds of 40 mph or less, $L=WS^2/60$

For speeds of 45 mph or more, $L=WS$

Where: L = taper length in feet
W = width of offset in feet
S = posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

*** - Maximum downstream taper length is 100 feet. See Section 6C.08.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Atifa Ferouz
REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Atifa Ferouz
No. C80402
Exp. 3-31-19
CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TABLE 1

TAPER LENGTH CRITERIA AND CHANNELIZING DEVICE SPACING

SPEED (S)	MINIMUM TAPER LENGTH * FOR WIDTH OF OFFSET 12 FEET (W)				MAXIMUM CHANNELIZING DEVICE SPACING		
					X	Y	Z **
	TANGENT 2L	MERGING L	SHIFTING L/2	SHOULDER L/3	TAPER	TANGENT	CONFLICT
mph	ft	ft	ft	ft	ft	ft	ft
20	160	80	40	27	20	40	10
25	250	125	63	42	25	50	12
30	360	180	90	60	30	60	15
35	490	245	123	82	35	70	17
40	640	320	160	107	40	80	20
45	1080	540	270	180	45	90	22
50	1200	600	300	200	50	100	25
55	1320	660	330	220	50	100	25
60	1440	720	360	240	50	100	25
65	1560	780	390	260	50	100	25
70	1680	840	420	280	50	100	25
75	1800	900	450	300	50	100	25

* - For other offsets, use the following merging taper length formula for L:
For speed of 40 mph or less, $L = WS^2/60$
For speed of 45 mph or more, $L = WS$

Where: L = Taper length in feet
W = Width of offset in feet
S = Posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

** - Use for taper and tangent sections where there are no pavement markings or where there is a conflict between existing pavement markings and channelizers (CA).

TABLE 2

LONGITUDINAL BUFFER SPACE AND FLAGGER STATION SPACING

SPEED *	Min D **	DOWNGRADE Min D ***		
		-3%	-6%	-9%
mph	ft	ft	ft	ft
20	115	116	120	126
25	155	158	165	173
30	200	205	215	227
35	250	257	271	287
40	305	315	333	354
45	360	378	400	427
50	425	446	474	507
55	495	520	553	593
60	570	598	638	686
65	645	682	728	785
70	730	771	825	891
75	820	866	927	1003

* - Speed is posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

** - Longitudinal buffer space or flagger station spacing

*** - Use on sustained downgrade steeper than -3 percent and longer than 1 mile.

TABLE 3

ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS *		
	A	B	C
	ft	ft	ft
URBAN - 25 mph OR LESS	100	100	100
URBAN - MORE THAN 25 mph TO 40 mph	250	250	250
URBAN - MORE THAN 40 mph	350	350	350
RURAL	500	500	500
EXPRESSWAY / FREEWAY	1000	1500	2640

* - The distances are approximate, are intended for guidance purposes only, and should be applied with engineering judgment. These distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommmended distances.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM TABLES FOR LANE AND RAMP CLOSURES

NO SCALE

1-29-18

Return to Table of Contents

NOTES:

See Standard Plan T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

Provide at least one person to continuously maintain traffic control devices for lane closures.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

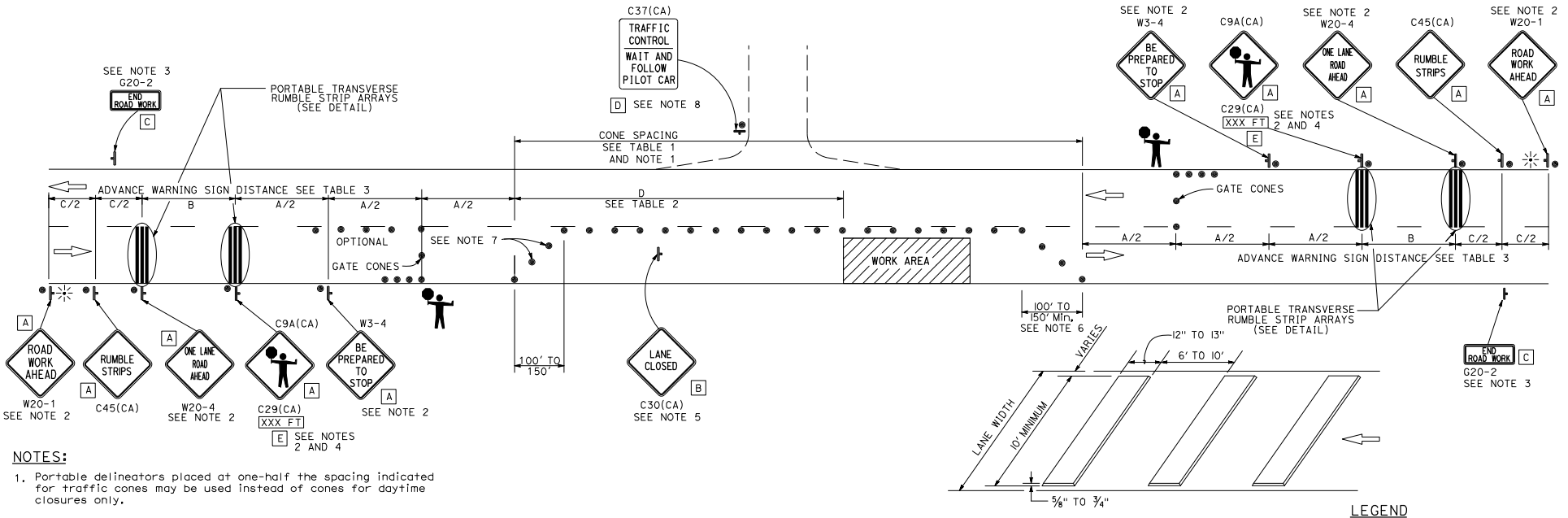
Atifa Ferouz
REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Atifa Ferouz
No. C80402
Exp. 3-31-19
CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TYPICAL LANE CLOSURE WITH REVERSIBLE CONTROL



PORTABLE TRANSVERSE RUMBLE STRIP ARRAY DETAIL

NOTES:

1. Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
2. Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
3. A G20-2 "END ROAD WORK" sign, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within the larger project's limits.
4. An optional C29(CA) sign may be placed below the C9A(CA) sign.
5. Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work area. They are optional if the work area is visible from nthe flagger station.
6. Length may be reduced by the Engineer to address site conditions.
7. Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type I, II, or III.
8. When a pilot car is used, place a C37(CA) "TRAFFIC CONTROL-WAIT AND FOLLOW PILOT CAR" sign with black legend on white background at all intersections, driveways and alleys without a flagger within the traffic control area.

SIGN PANEL SIZE (Min)

A	48" x 48"
B	30" x 30"
C	36" x 18"
D	36" x 42"
E	20" x 7"

LEGEND

- TRAFFIC CONE
- TEMPORARY TRAFFIC CONTROL SIGN
- PORTABLE FLASHING BEACON
- FLAGGER

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON TWO LANE CONVENTIONAL HIGHWAYS

NO SCALE

T13

1-29-18

Return to Table of Contents