McKinleyville Community Services District

Highway Sewer Crossing Retrofit Project

Contract Documents

October 2026

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GHD Inc: 12669030

McKinleyville Community Services District

Highway Sewer Crossing Retrofit

Issue for Bid

October 2026

Prepared for

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

BOARD OF DIRECTORS

Dennis Mayo, President
David Couch, Vice President
Scott Binder, Director
James Biteman, Director
Gregory Orsini, Director

Pat Kaspari, General Manager

Prepared by

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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 Highway Sewer Crossing Retrofit.

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 1:30 p.m., October 19, 2026, 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 the installation of two steel encased sewer mains crossing the US-101 via Horizontal Auger Boring (HAB) comprised of one 18-inch PVC or HDPE sewer main within a steel casing and one 12-inch PVC or HDPE sewer main within a steel casing and associated work including sewer manholes, 10-inch to 18-inch PVC sewer mains installed via open trench, connections to existing sewer mains and manholes, coating and rechanneling of existing manholes, paving and site restoration, and other items of work as shown on the Plans. Temporary bypass pumping will be required to maintain flows during construction. Settlement monitoring will be required for each highway crossing.

Contractors shall submit a Qualifications Statements as a part of their bid that meet the requirements in the following sections of the Contract Documents: Part 1.8.F of Specification 31 09 13 (Geotechnical Instrumentation and Monitoring), Part 1.7.E of Specification Section 33 05 07.22 (Horizontal Auger Boring), and Part 1.8.E of Specification 33 05 07.23 (Carrier Pipe Installation).

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 November 6, 2026, at 10:00 a.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 General Manager 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 Patrick Sullivan (patrick.sullivan@ghd.com), with a copy to Luke Halonen (luke.halonen@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 a Payment Bond, Warranty 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 the bid must provide valid Department of Industrial Relations registration number(s). Failure to provide valid DIR registration numbers in the bidding documents shall disqualify the bid.

Dennis Mayo
President
McKinleyville Community Services District

October 7, 2026
Date

BIDDING REQUIREMENTS SUMMARY

1.	PROJECT TITLE:	Highway Sewer Crossing Retrofit
2.	BID SUBMITTAL/ BID OPENING:	In-Person at District Office **November 6, 2026** **10:00 AM,** Pacific Daylight Time
3.	QUESTION SUBMITTAL:	Project Question Submission Deadline **October 28, 2026** **5:00 PM,** Pacific Daylight Time
4.	PRE-BID CONFERENCE:	In-Person (Non-mandatory) **October 19, 2026** **1:30 PM,** Pacific Daylight Time
5.	BID SECURITY:	10% of maximum amount of bid
6.	CONSTRUCTION TIME PERIOD:	Three Hundred Sixty-Five (365) Calendar days
7.	LIQUIDATED DAMAGES:	$2,500.00 per calendar day
8.	LABOR AND MATERIALS PAYMENT BOND:	100% of the base bid
9.	PERFORMANCE BOND	100% of the base bid
10.	WARRANTY BOND	100% of the base bid
11.	PREVAILING WAGE RATES	Yes
12.	BID VALID FOR:	Sixty (60) days
13.	COST FOR EACH CONTRACT DOCUMENT SET	$0 Electronic only
14.	BUILDERS EXCHANGES ISSUED CONSTRUCTION DOCUMENTS	Humboldt Builders Exchange 624 C Street Eureka, CA 95501 (707) 442-3708 North Coast Builders Exchange 1030 Apollo Way Santa Rosa, CA 95407 (707) 542-9502 Shasta Builders Exchange 5800 Airport Road Redding, CA 96002 (530) 221-5556 Sacramento Builder’s Exchange 5370 Elvas Avenue Sacramento, CA 95819 (916) 442-8991

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PART 1
BID REQUIREMENTS

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INFORMATION FOR BIDDERS

Project: Highway Sewer Crossing Retrofit

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: McKinleyville Community Services District Highway Sewer Crossing Retrofit, 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 General Manager 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 sixty (60) days 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, warranty 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, warranty 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, warranty 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, warranty 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, warranty 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 an interpretation thereof no later than October 28, 2026 at 5:00 PM. 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: Patrick Sullivan at patrick.sullivan@ghd.com, with a copy to Luke Halonen at luke.halonen@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, Warranty 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 and unresponsive 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 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 two working days following bid opening (the “Bid Protest Deadline”) and must comply with the following requirements:

(a) 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.

(b) 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.

(c) 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.

(d) 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.

(e) 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.

(f) 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 (patrick.sullivan@ghd.com and luke.halonen@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 they have 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 their 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		CHECKED
1.	Bid Proposal	_____
2.	Acknowledgement of Addenda	_____
3.	List of Subcontractors (Subcontractor Details)	_____
4.	Bid Bond	_____
5.	Authority to Sign Bid Proposal (if applicable)	_____
6.	Power of Attorney	_____
7.	Non-Collusion Affidavit	_____
8.	Workers Compensation Certification	_____
9.	Anti-Lobbying Certification	_____
10.	Davis Bacon Requirements	_____
11.	Davis Bacon and California Prevailing Wage Determinations	_____
12.	Qualifications Statement that meets the requirements of Specification 31 09 13, Geotechnical Instrumentation and Monitoring, Part 1.8.F	_____
13.	Qualifications Statement that meets the requirements of Specification 33 05 07.22, Horizontal Auger Boring, Part 1.7.E	_____
14.	Qualifications Statement that meets the requirements of, and includes the documentation listed in, Specification 33 05 07.23, Carrier Pipe Installation, Part 1.8.E	_____

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BID

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 Highway Sewer Crossing Retrofit 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.

BID PROPOSAL

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 under this Contract includes, but is not limited to, furnishing all labor, materials, equipment and incidentals necessary to complete the project. The Work consists of traffic control; stockpiling; miscellaneous demolition; potholing; construction staking; trenching, shoring, sheeting, and bracing; excavation and grading; temporary bypass pumping; demolition of existing manholes; installation of steel casing using trenchless construction methods; installation of new gravity sewer mains and sewer manholes; connections to existing facilities; rehabilitation existing sewer manholes; placement of subgrade materials; application of tack coat; placement and compaction of asphalt pavement; site 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.

The Owner reserves the right to award one, any combination, or all of the Work Area Bid Schedules (Item 2. Middle Crossing, and Item 3. South Crossing) based on available funding. Each Work Area Bid Schedule constitutes an independent base scope of work capable of being awarded and constructed on a standalone basis.

Bid Item 1, Major Equipment Mobilization/Demobilization, will be awarded if any Work Area Bid Schedule is awarded.

Measurement and payment for all Work shall be governed by Section 01 15 00, Measurement and Payment.

Item 1. Major Equipment Mobilization/Demobilization Bid Schedule:

BID SCHEDULE – MAJOR EQUIPMENT MOBILIZATION/DEMOBILIZATION					
Item No.	Description	Unit	Qty	Unit Cost	Total Cost
1.01	Major Equipment Mobilization/Demobilization	LS	1	$_____	$_____

Item 2. Middle Crossing Bid Schedule:

BASE BID SCHEDULE – MIDDLE CROSSING					
Item No.	Description	Unit	Qty	Unit Cost	Total Cost
2.01	Work Area Mobilization/Demobilization	LS	1	$_____	$_____
2.02	Construction Staking	LS	1	$_____	$_____
2.03	Traffic Control	LS	1	$_____	$_____
2.04	Erosion and Sediment Controls	LS	1	$_____	$_____
2.05	Potholing	LS	1	$_____	$_____
2.06	Demolition	LS	1	$_____	$_____
2.07	Temporary Bypass Pumping	LS	1	$_____	$_____
2.08	Dewatering	LS	1	$_____	$_____
2.09	Middle Sewer Crossing via HAB – 12-inch Carrier Pipe in Steel Casing	LS	1	$_____	$_____
2.10	Sewer Manhole 60-inch Diameter (MH5-2-1 and MH5-4-1)	EA	2	$_____	$_____
2.11	Sewer Manhole 72-inch Diameter (MH5-4-2)	EA	1	$_____	$_____
2.12	Sewer Main 10-inch PVC	LF	19	$_____	$_____
2.13	Sewer Main 12-inch PVC	LF	8	$_____	$_____
2.14	Connect to Existing Sewer Main	EA	2	$_____	$_____
2.15	Connect to Existing Sewer Manhole and Rechannel (MH5-2)	EA	1	$_____	$_____

BASE BID SCHEDULE – MIDDLE CROSSING					
2.16	Existing 48-inch Sewer Manhole Rehabilitation (MH5-2, MH5-3)	EA	2	$_____	$_____
2.17	New Sewer Manhole Interior Coating (MH5-2-1, MH5-4-1, and MH5-4-2)	EA	3	$_____	$_____
2.18	Final Paving, Curb and Gutter Replacement on Thiel Avenue	LS	1	$_____	$_____
2.19	Settlement Monitoring	LS	1	$_____	$_____
2.20	Replace Fence	LS	1	$_____	$_____
2.21	Landscape Restoration	LS	1	$_____	$_____

MIDDLE CROSSING SUBTOTAL ($_____)

MIDDLE CROSSING SUBTOTAL IN WORDS:_____

Item 3. South Crossing Bid Schedule:

BID SCHEDULE – SOUTH CROSSING					
Item No.	Description	Unit	Qty	Unit Cost	Total Cost
3.01	Work Area Mobilization/Demobilization	LS	1	$_____	$_____
3.02	Construction Staking	LS	1	$_____	$_____
3.03	Traffic Control	LS	1	$_____	$_____
3.04	Erosion and Sediment Controls	LS	1	$_____	$_____
3.05	NOT USED				
3.06	Potholing	LS	1	$_____	$_____

BID SCHEDULE – SOUTH CROSSING					
3.07	Demolition	LS	1	$_____	$_____
3.08	Temporary Bypass Pumping	LS	1	$_____	$_____
3.09	Dewatering	LS	1	$_____	$_____
3.10	South Sewer Crossing via HAB – 18-inch Carrier Pipe in Steel Casing	LS	1	$_____	$_____
3.11	Steel Casing Cathodic Protection	LS	1	$_____	$_____
3.12	Sewer Manhole 60-inch Diameter (MH3-9-1, MH3-10-1, and MH3-10-2)	EA	3	$_____	$_____
3.13	Sewer Main 15-inch PVC	LF	43	$_____	$_____
3.14	Sewer Main 18-inch PVC	LF	6	$_____	$_____
3.15	Connect to Existing Sewer Main	EA	1	$_____	$_____
3.16	Connect to Existing Manhole and Rechannel (MH3-9)	EA	1	$_____	$_____
3.17	Existing Sewer Manhole Rehabilitation (MH3-9)	EA	1	$_____	$_____
3.18	New Sewer Manhole Interior Coating (MH3-9-1, MH3-10-1, and MH3-10-2)	EA	3	$_____	$_____
3.19	Settlement Monitoring	LS	1	$_____	$_____
3.20	Replace Fence	LS	1	$_____	$_____
3.21	Landscape Restoration	LS	1	$_____	$_____

SOUTH CROSSING SUBTOTAL ($_____)

SOUTH CROSSING SUBTOTAL IN WORDS:_____

The Total of Bid is the sum of all bid item subtotals, including Major Equipment Mobilization/ Demobilization and all Work Area Bid Schedules (Item 1. Major Equipment Mobilization/Demobilization Bid Schedule, Item 2. Middle Crossing Bid Schedule, Item 3. South Crossing Bid Schedule).

TOTAL OF BID ($_____)

TOTAL OF BID IN WORDS:_____

The apparent low bidder shall be determined based on the Total of Bid.
Receipt of the following Addenda is acknowledged:

_____

_____

_____

The representations made herein are made under penalty of perjury.

Respectfully submitted:

_____ _____
Signature Date

_____ _____
Title Company

_____
Street Address City State ZIP

_____ _____
Phone Number Email

_____ (SEAL - If Bid is by Corporation)
License Number

_____
License Expiration Date

_____
DIR Registration Number

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.

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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:

Highway Sewer Crossing Retrofit

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 their 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]

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CONTRACTOR'S CERTIFICATION REGARDING WORKERS' COMPENSATION INSURANCE

State of California

County of ___Humboldt_____

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: _____

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ANTI-LOBBYING CERTIFICATION

The Contractor certifies, by signing and submitting this bid or proposal, to the best of their 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 their bid or proposal that they 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 under the provisions in Title 31, U.S. Code Chapter 38. The above certification is part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Certification.

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DAVIS-BACON REQUIREMENTS

Compliance with the Davis-Bacon Act.

a. All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 U.S.C. 3141- 3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable. The Contractor shall comply with 40 U.S.C. 3141-3144, and 3146-3148 and the requirements of 29 C.F.R. pt. 5 as applicable.

b. Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.

c. Additionally, Contractors are required to pay wages not less than once a week.

The Contractor also agrees by submitting their bid or proposal that they shall require that the language of this certification be included in all lower tier subcontracts, and that all such subrecipients shall certify and disclose accordingly.

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DAVIS BACON AND CALIFORNIA PREVAILING WAGE DETERMINATION

"General Decision Number: CA20260004 09/03/2026

State: California

Construction Types: Heavy and Highway

Counties: California Counties of
Del Norte, Humboldt, Lake and Mendocino

Building Construction Projects
Dredging Projects-Includes Dredging Projects (does not include hopper dredge work)
Heavy Construction Projects (excludes water well drilling)
Highway Construction Projects
Residential Construction Projects (Consisting of single family homes and apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/02/2026
1	05/18/2026
2	05/20/2026
3	05/21/2026
4	09/03/2026

ASBE0016-005 01/01/2024

	Rates	Fringes
ASBESTOS WORKERS/INSULATOR: INCLUDES THE APPLICATION OF ALL INSULATING MATERIALS, PROTECTIVE COVERINGS, COATINGS, AND FINISHES TO ALL TYPES OF MECHANICAL SYSTEMS (1) MENDOCINO COUNTY	$ 64.56	25.07
ASBESTOS WORKERS/INSULATOR: INCLUDES THE APPLICATION OF ALL INSULATING MATERIALS, PROTECTIVE COVERINGS, COATINGS, AND FINISHES TO ALL TYPES OF MECHANICAL SYSTEMS (2) DEL NORTE, HUMBOLDT, LAKE COUNTIES	$ 64.56	25.07

ASBE0016-006 05/01/2025

	Rates	Fringes
ASBESTOS REMOVAL WORKER/HAZARDOUS MATERIAL HANDLER (INCLUDES PREPARATION, WETTING, STRIPPING, REMOVAL, SCRAPPING, VACUUMING, BAGGING AND DISPOSING OF ALL INSULATION MATERIALS FROM MECHANICAL SYSTEMS, WHETHER THEY CONTAIN ASBESTOS OR NOT)	$ 35.31	12.75

BRCA0003-001 08/01/2024

	Rates	Fringes
MARBLE FINISHER	$ 42.06	19.80

BRCA0003-003 08/01/2024

	Rates	Fringes
MARBLE MASON	$ 61.72	30.31

BRCA0003-006 05/01/2024

	Rates	Fringes
BRICKLAYER SPECIALTY PAY: (A) UNDERGROUND WORK SUCH AS TUNNEL WORK, SEWER WORK, MANHOLES, CATCH BASINS, SEWER PIPES AND TELEPHONE CONDUIT SHALL BE PAID $1.25 PER HOUR ABOVE THE REGULAR RATE. WORK IN DIRECT CONTACT WITH RAW SEWAGE SHALL RECEIVE $1.25 PER HOUR IN ADDITION TO THE ABOVE. (B) OPERATING A SAW OR GRINDER SHALL RECEIVE $1.25 PER HOUR ABOVE THE REGULAR RATE. (C) GUNITE NOZZLE		

PERSON SHALL RECEIVE $1.25 PER HOUR ABOVE THE
REGULAR RATE.....$ 57.02 28.50

BRCA0003-008 07/01/2024

	Rates	Fringes
TERRAZZO FINISHER	$ 44.93	20.98
TERRAZZO WORKER/SETTER	$ 60.58	29.79

BRCA0003-013 04/01/2024

	Rates	Fringes
TILE FINISHER (DEL NORTE & HUMBOLDT COUNTIES)	$ 37.75	19.28
TILE FINISHER (LAKE & MENDOCINO COUNTIES)	$ 35.78	19.23
TILE LAYER (DEL NORTE & HUMBOLDT COUNTIES)	$ 59.92	22.62
TILE LAYER (LAKE & MENDOCINO COUNTIES)	$ 56.79	22.54

CARP0034-001 07/01/2021

	Rates	Fringes
DIVER: ASSISTANT TENDER, ROV TENDER/TECHNICIAN DEPTH PAY (SURFACE DIVING): 050 TO 100 FT $2.00 PER FOOT 101 TO 150 FT $3.00 PER FOOT 151 TO 220 FT $4.00 PER FOOT 221 FT.-DEEPER $5.00 PER FOOT SATURATION DIVING: THE STANDBY RATE SHALL APPLY UNTIL SATURATION STARTS. THE SATURATION DIVING RATE APPLIES WHEN DIVERS ARE UNDER PRESSURE CONTINUOUSLY UNTIL WORK TASK AND DECOMPRESSION ARE COMPLETE. THE DIVER RATE SHALL BE PAID FOR ALL SATURATION HOURS. DIVING IN ENCLOSURES: WHERE IT IS NECESSARY FOR DIVERS TO ENTER PIPES OR TUNNELS, OR OTHER ENCLOSURES WHERE THERE IS NO VERTICAL ASCENT, THE FOLLOWING PREMIUM SHALL BE PAID: DISTANCE TRAVELED FROM ENTRANCE 26 FEET TO 300 FEET: $1.00 PER FOOT. WHEN IT IS NECESSARY FOR A DIVER TO ENTER ANY PIPE, TUNNEL OR OTHER ENCLOSURE LESS THAN 48"" IN HEIGHT, THE PREMIUM WILL BE $1.00 PER FOOT. WORK IN COMBINATION OF CLASSIFICATIONS: EMPLOYEES WORKING IN ANY COMBINATION OF CLASSIFICATIONS WITHIN THE DIVING CREW (EXCEPT DIVE SUPERVISOR) IN A SHIFT ARE PAID IN THE CLASSIFICATION WITH THE HIGHEST RATE FOR THAT SHIFT	$ 54.10	34.69
DIVER: DIVER STANDBY DEPTH PAY (SURFACE DIVING): 050 TO 100 FT $2.00 PER FOOT 101 TO 150 FT $3.00 PER FOOT 151 TO 220 FT $4.00 PER FOOT 221 FT.-DEEPER $5.00 PER FOOT SATURATION DIVING: THE STANDBY RATE SHALL APPLY UNTIL SATURATION STARTS. THE SATURATION DIVING RATE APPLIES WHEN DIVERS ARE UNDER PRESSURE CONTINUOUSLY UNTIL WORK TASK AND DECOMPRESSION ARE COMPLETE. THE DIVER RATE SHALL BE PAID FOR ALL SATURATION HOURS. DIVING IN ENCLOSURES: WHERE IT IS NECESSARY FOR DIVERS TO ENTER PIPES OR TUNNELS, OR OTHER ENCLOSURES WHERE THERE IS NO VERTICAL ASCENT, THE FOLLOWING PREMIUM SHALL BE PAID: DISTANCE TRAVELED FROM ENTRANCE 26 FEET TO 300 FEET: $1.00 PER FOOT. WHEN IT IS NECESSARY FOR A DIVER TO ENTER ANY PIPE, TUNNEL OR OTHER ENCLOSURE LESS THAN 48"" IN HEIGHT, THE PREMIUM WILL BE $1.00 PER FOOT. WORK IN COMBINATION OF CLASSIFICATIONS: EMPLOYEES WORKING IN ANY COMBINATION OF CLASSIFICATIONS WITHIN THE DIVING CREW (EXCEPT DIVE SUPERVISOR) IN A SHIFT ARE PAID IN THE CLASSIFICATION WITH THE HIGHEST RATE FOR THAT SHIFT	$ 60.51	34.69
DIVER: DIVER TENDER DEPTH PAY (SURFACE DIVING): 050 TO 100 FT $2.00 PER FOOT 101 TO 150 FT $3.00 PER FOOT 151 TO 220 FT $4.00 PER FOOT 221 FT.-DEEPER $5.00 PER FOOT SATURATION DIVING: THE STANDBY RATE SHALL APPLY UNTIL SATURATION STARTS. THE SATURATION DIVING RATE APPLIES WHEN DIVERS ARE UNDER PRESSURE CONTINUOUSLY UNTIL WORK TASK AND DECOMPRESSION ARE COMPLETE. THE		

DIVER RATE SHALL BE PAID FOR ALL SATURATION HOURS.
DIVING IN ENCLOSURES: WHERE IT IS NECESSARY FOR DIVERS TO ENTER PIPES OR TUNNELS, OR OTHER ENCLOSURES WHERE THERE IS NO VERTICAL ASCENT, THE FOLLOWING PREMIUM SHALL BE PAID: DISTANCE TRAVELED FROM ENTRANCE 26 FEET TO 300 FEET: $1.00 PER FOOT. WHEN IT IS NECESSARY FOR A DIVER TO ENTER ANY PIPE, TUNNEL OR OTHER ENCLOSURE LESS THAN 48"" IN HEIGHT, THE PREMIUM WILL BE $1.00 PER FOOT. WORK IN COMBINATION OF CLASSIFICATIONS: EMPLOYEES WORKING IN ANY COMBINATION OF CLASSIFICATIONS WITHIN THE DIVING CREW (EXCEPT DIVE SUPERVISOR) IN A SHIFT ARE PAID IN THE CLASSIFICATION WITH THE HIGHEST RATE FOR THAT SHIFT.....$ 59.51 34.69

DIVER: DIVER WET DEPTH PAY (SURFACE DIVING): 050 TO 100 FT $2.00 PER FOOT 101 TO 150 FT $3.00 PER FOOT 151 TO 220 FT $4.00 PER FOOT 221 FT.-DEEPER $5.00 PER FOOT SATURATION DIVING: THE STANDBY RATE SHALL APPLY UNTIL SATURATION STARTS. THE SATURATION DIVING RATE APPLIES WHEN DIVERS ARE UNDER PRESSURE CONTINUOUSLY UNTIL WORK TASK AND DECOMPRESSION ARE COMPLETE. THE DIVER RATE SHALL BE PAID FOR ALL SATURATION HOURS.
DIVING IN ENCLOSURES: WHERE IT IS NECESSARY FOR DIVERS TO ENTER PIPES OR TUNNELS, OR OTHER ENCLOSURES WHERE THERE IS NO VERTICAL ASCENT, THE FOLLOWING PREMIUM SHALL BE PAID: DISTANCE TRAVELED FROM ENTRANCE 26 FEET TO 300 FEET: $1.00 PER FOOT. WHEN IT IS NECESSARY FOR A DIVER TO ENTER ANY PIPE, TUNNEL OR OTHER ENCLOSURE LESS THAN 48"" IN HEIGHT, THE PREMIUM WILL BE $1.00 PER FOOT. WORK IN COMBINATION OF CLASSIFICATIONS: EMPLOYEES WORKING IN ANY COMBINATION OF CLASSIFICATIONS WITHIN THE DIVING CREW (EXCEPT DIVE SUPERVISOR) IN A SHIFT ARE PAID IN THE CLASSIFICATION WITH THE HIGHEST RATE FOR THAT SHIFT.....$ 103.62 34.69

DIVER: MANIFOLD OPERATOR (MIXED GAS) DEPTH PAY (SURFACE DIVING): 050 TO 100 FT $2.00 PER FOOT 101 TO 150 FT $3.00 PER FOOT 151 TO 220 FT $4.00 PER FOOT 221 FT.-DEEPER $5.00 PER FOOT SATURATION DIVING: THE STANDBY RATE SHALL APPLY UNTIL SATURATION STARTS. THE SATURATION DIVING RATE APPLIES WHEN DIVERS ARE UNDER PRESSURE CONTINUOUSLY UNTIL WORK TASK AND DECOMPRESSION ARE COMPLETE. THE DIVER RATE SHALL BE PAID FOR ALL SATURATION HOURS. DIVING IN ENCLOSURES: WHERE IT IS NECESSARY FOR DIVERS TO ENTER PIPES OR TUNNELS, OR OTHER ENCLOSURES WHERE THERE IS NO VERTICAL ASCENT, THE FOLLOWING PREMIUM SHALL BE PAID: DISTANCE TRAVELED FROM ENTRANCE 26 FEET TO 300 FEET: $1.00 PER FOOT. WHEN IT IS NECESSARY FOR A DIVER TO ENTER ANY PIPE, TUNNEL OR OTHER ENCLOSURE LESS THAN 48"" IN HEIGHT, THE PREMIUM WILL BE $1.00 PER FOOT. WORK IN COMBINATION OF CLASSIFICATIONS: EMPLOYEES WORKING IN ANY COMBINATION OF CLASSIFICATIONS WITHIN THE DIVING CREW (EXCEPT DIVE SUPERVISOR) IN A SHIFT ARE PAID IN THE CLASSIFICATION WITH THE HIGHEST RATE FOR THAT SHIFT.....$ 64.51 34.69

DIVER: MANIFOLD OPERATOR (STANDBY) DEPTH PAY (SURFACE DIVING): 050 TO 100 FT $2.00 PER FOOT 101 TO 150 FT $3.00 PER FOOT 151 TO 220 FT $4.00 PER FOOT 221 FT.-DEEPER $5.00 PER FOOT SATURATION DIVING: THE STANDBY RATE SHALL APPLY UNTIL SATURATION STARTS. THE SATURATION DIVING RATE APPLIES WHEN DIVERS ARE UNDER PRESSURE CONTINUOUSLY UNTIL WORK TASK AND DECOMPRESSION ARE COMPLETE. THE DIVER RATE SHALL BE PAID FOR ALL SATURATION HOURS. DIVING IN ENCLOSURES: WHERE IT IS NECESSARY FOR DIVERS TO ENTER PIPES OR TUNNELS, OR OTHER ENCLOSURES WHERE THERE IS NO VERTICAL ASCENT, THE FOLLOWING PREMIUM SHALL BE PAID: DISTANCE TRAVELED FROM ENTRANCE 26

FEET TO 300 FEET: $1.00 PER FOOT. WHEN IT IS NECESSARY FOR A DIVER TO ENTER ANY PIPE, TUNNEL OR OTHER ENCLOSURE LESS THAN 48"" IN HEIGHT, THE PREMIUM WILL BE $1.00 PER FOOT. WORK IN COMBINATION OF CLASSIFICATIONS: EMPLOYEES WORKING IN ANY COMBINATION OF CLASSIFICATIONS WITHIN THE DIVING CREW (EXCEPT DIVE SUPERVISOR) IN A SHIFT ARE PAID IN THE CLASSIFICATION WITH THE HIGHEST RATE FOR THAT SHIFT.....$ 59.51 34.69

CARP0034-003 07/01/2021

	Rates	Fringes
PILEDRIVER	$ 54.10	34.69

CARP0751-002 07/01/2021

	Rates	Fringes
CARPENTERS: BRIDGE BUILDER/HIGHWAY CARPENTER (DEL NORTE, HUMBOLDT, LAKE AND MENDOCINO COUNTIES)	$ 54.85	31.49
CARPENTERS: HARDWOOD FLOORLAYER, SHINGLER, POWER SAW OPERATOR, STEEL SCAFFOLD & STEEL SHORING ERECTOR, SAW FILER (DEL NORTE, HUMBOLDT, LAKE AND MENDOCINO COUNTIES)	$ 47.77	31.49
CARPENTERS: JOURNEYMAN CARPENTER (DEL NORTE, HUMBOLDT, LAKE AND MENDOCINO COUNTIES)	$ 47.62	31.49
CARPENTERS: MILLWRIGHT (DEL NORTE, HUMBOLDT, LAKE AND MENDOCINO COUNTIES)	$ 50.12	33.08

ELEC0551-001 06/01/2024

	Rates	Fringes
ELECTRICIAN (LAKE AND MENDOCINO COUNTIES) TUNNEL WORK: ADD $0.50 PER HOUR	$ 59.17	32.04

ELEC0551-002 06/01/2024

	Rates	Fringes
ELECTRICIANS (DEL NORTE AND HUMBOLDT COUNTIES) TUNNEL WORK: ADD $0.50 PER HOUR	$ 59.17	32.04

ELEC1245-002 01/01/2025

	Rates	Fringes
LINE CONSTRUCTION: (1) LINEMAN; CABLE SPLICER (HUMBOLDT, LAKE AND MENDOCINO COUNTIES) HOLIDAYS: NEW YEAR'S DAY, M.L. KING DAY, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, VETERANS DAY, THANKSGIVING DAY AND DAY AFTER THANKSGIVING, CHRISTMAS DAY	$ 70.16	24.71
LINE CONSTRUCTION: (2) EQUIPMENT SPECIALIST (OPERATES CRAWLER TRACTORS, COMMERCIAL MOTOR VEHICLES, BACKHOES, TRENCHERS, CRANES (50 TONS AND BELOW), OVERHEAD & UNDERGROUND DISTRIBUTION LINE EQUIPMENT) (HUMBOLDT, LAKE AND MENDOCINO COUNTIES) HOLIDAYS: NEW YEAR'S DAY, M.L. KING DAY, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, VETERANS DAY, THANKSGIVING DAY AND DAY AFTER THANKSGIVING, CHRISTMAS DAY	$ 53.30	22.26
LINE CONSTRUCTION: (3) GROUNDMAN (HUMBOLDT, LAKE AND MENDOCINO COUNTIES) HOLIDAYS: NEW YEAR'S DAY, M.L. KING DAY, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, VETERANS DAY, THANKSGIVING DAY AND DAY AFTER THANKSGIVING, CHRISTMAS DAY	$ 40.76	21.76
LINE CONSTRUCTION: (4) POWDERMAN (HUMBOLDT, LAKE AND MENDOCINO COUNTIES) HOLIDAYS: NEW YEAR'S DAY, M.L. KING DAY, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, VETERANS DAY, THANKSGIVING DAY AND DAY AFTER THANKSGIVING, CHRISTMAS DAY	$ 40.76	21.76

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	Rates	Fringes

OPERATOR: POWER EQUIPMENT, PILEDRIVING - AREA 1: GROUP 4 - ASSISTANT OPERATOR IN LIEU OF ASSISTNAT TO ENGINEER; FORKLIFT, 10 TONS AND OVER; HEAVY DUTY REPAIRPERSON/WELDER.....$ 47.37 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING - AREA 1: GROUP 5 - DECK ENGINEER.....$ 44.73 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING - AREA 1: GROUP 6 - DECKHAND, FIRE TENDER.....$ 42.50 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING, Lifting Devices - AREA 1: GROUP 1 - DERRICK BARGE PEDESTAL MOUNTED OVER 100 TONS; CLAMSHELL OVER 7 CU. YDS.; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE OVER 100 TONS; TRUCK CRANE OR CRAWLER, LAND OR BARGE MOUNTED OVER 100 TONS.....$ 52.64 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING, Lifting Devices - AREA 1: GROUP 2 - DERRICK BARGE PEDESTAL MOUNTED 45 TONS TO AND INCLUDING 100 TONS; CLAMSHELL UP TO AND INCLUDING 7 CU. YDS.; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE OVER 45 TONS; TRUCK CRANE OR CRAWLER, LAND OR BARGE MOUNTED, OVER 45 TONS UP TO AND INCLUDING 100 TONS; FUNDEX F-12 HYDRAULIC PILE RIG.....$ 50.82 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING, Lifting Devices - AREA 1: GROUP 3 - DERRICK BARGE PEDESTAL MOUNTED UNDER 45 TONS; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE 45 TONS AND UNDER; SKID/SCOW PILEDRIVER, ANY TONNAGE; TRUCK CRANE OR CRAWLER, LAND OR MARGE MOUNTED 45 TONS AND UNDER.....$ 49.14 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING, Oiler - AREA 1: GROUP 1 - DERRICK BARGE PEDESTAL MOUNTED OVER 100 TONS; CLAMSHELL OVER 7 CU. YDS.; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE OVER 100 TONS; TRUCK CRANE OR CRAWLER, LAND OR BARGE MOUNTED OVER 100 TONS.....$ 43.38 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING, Oiler - AREA 1: GROUP 2 - DERRICK BARGE PEDESTAL MOUNTED 45 TONS TO AND INCLUDING 100 TONS; CLAMSHELL UP TO AND INCLUDING 7 CU. YDS.; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE OVER 45 TONS; TRUCK CRANE OR CRAWLER, LAND OR BARGE MOUNTED, OVER 45 TONS UP TO AND INCLUDING 100 TONS; FUNDEX F-12 HYDRAULIC PILE RIG.....$ 43.11 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING, Oiler - AREA 1: GROUP 3 - DERRICK BARGE PEDESTAL MOUNTED UNDER 45 TONS; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE 45 TONS AND UNDER; SKID/SCOW PILEDRIVER, ANY TONNAGE; TRUCK CRANE OR CRAWLER, LAND OR MARGE MOUNTED 45 TONS AND UNDER.....$ 42.89 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING, Truck Crane OIler - AREA 1: GROUP 1 - DERRICK BARGE PEDESTAL MOUNTED OVER 100 TONS; CLAMSHELL OVER 7 CU. YDS.; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE OVER 100 TONS; TRUCK CRANE OR CRAWLER, LAND OR BARGE MOUNTED OVER 100 TONS.....$ 45.66 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING, Truck Crane Oiler - AREA 1: GROUP 2 - DERRICK BARGE PEDESTAL MOUNTED 45 TONS TO AND INCLUDING 100 TONS; CLAMSHELL UP TO AND INCLUDING 7 CU. YDS.; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE OVER 45 TONS; TRUCK CRANE OR CRAWLER, LAND OR BARGE MOUNTED, OVER 45 TONS UP TO AND INCLUDING 100 TONS; FUNDEX F-12 HYDRAULIC PILE RIG.....$ 45.41 31.15

OPERATOR: POWER EQUIPMENT, PILEDRIVING, Truck Crane Oiler - AREA 1: GROUP 3 - DERRICK BARGE PEDESTAL MOUNTED UNDER 45 TONS; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE 45 TONS AND UNDER; SKID/SCOW PILEDRIVER, ANY TONNAGE; TRUCK CRANE OR CRAWLER, LAND OR MARGE MOUNTED 45 TONS AND UNDER....$ 45.12 31.15

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	Rates	Fringes
OPERATOR: POWER EQUIPMENT, AREA 1: GROUP 1-		

OPERATOR OF HELICOPTER (WHEN USED IN ERECTION WORK); HYDRAULIC EXCAVATOR, 7 CU. YDS. AND OVER; POWER SHOVELS, OVER 7 CU. YDS. AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 66.96 32.53

OPERATOR: POWER EQUIPMENT, AREA 1: GROUP 2- HIGHLINE CABLEWAY; HYDRAULIC EXCAVATOR, 3 1/2 CU. YDS. UP TO 7 CU. YDS.; LICENSED CONSTRUCTION WORK BOAT OPERATOR, ON SITE; POWER BLADE OPERATOR (FINISH); POWER SHOVELS, OVER 1 CU. YD. UP TO AND INCLUDING 7 CU. YDS. M.R.C. AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 65.43 32.53

OPERATOR: POWER EQUIPMENT, AREA 1: GROUP 3- ASPHALT MILLING MACHINE; CABLE BACKHOE; COMBINATION BACKHOE AND LOADER OVER 3/4 CU. YDS.; CONTINUOUS FLIGHT TIE BACK MACHINE ASSISTANT TO ENGINEER OR MECHANIC; CRANE MOUNTED CONTINUOUS FLIGHT TIE BACK MACHINE, TONNAGE TO APPLY; CRANE MOUNTED DRILL ATTACHMENT, TONNAGE TO APPLY; DOZER, SLOPE BRD; GRADALL; HYDRAULIC EXCAVATOR, UP TO 3 1/2 CU. YDS.; LOADER 4 CU. YDS. AND OVER; LONG REACH EXCAVATOR; MULTIPLE ENGINE SCRAPER (WHEN USED AS PUSH PULL); POWER SHOVELS, UP TO AND INCLUDING 1 CU. YD.; PRE-STRESS WIRE WRAPPING MACHINE; SIDE BOOM CAT, 572 OR LARGER; TRACK LOADER 4 CU. YDS. AND OVER; WHEEL EXCAVATOR (UP TO AND INCLUDING 750 CU. YDS. PER HOUR) AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 63.95 32.53

OPERATOR: POWER EQUIPMENT, AREA 1: GROUP 4- ASPHALT PLANT ENGINEER/BOX PERSON; CHICAGO BOOM; COMBINATION BACKHOE AND LOADER UP TO AND INCLUDING 3/4 CU. YD.; CONCRETE BATCH PLANT (WET OR DRY); DOZER AND/OR PUSH CAT; PULL-TYPE ELEVATING LOADER; GRADESETTER, GRADE CHECKER (GPS, MECHANICAL OR OTHERWISE); GROOVING AND GRINDING MACHINE; HEADING SHIELD OPERATOR; HEAVY-DUTY DRILLING EQUIPMENT, HUGHES, LDH, WATSON 3000 OR SIMILAR; HEAVY-DUTY REPAIRPERSON AND/OR WELDER; LIME SPREADER; LOADER UNDER 4 CU. YDS.; LUBRICATION AND SERVICE ENGINEER (MOBILE AND GREASE RACK); MECHANICAL FINISHERS OR SPREADER MACHINE (ASPHALT, BARBER-GREENE AND SIMILAR); MILLER FORMLESS M-9000 SLOPE PAVER OR SIMILAR; PORTABLE CRUSHING ANDS CREENING PLANTS; POWER BLADE SUPPORT; ROLLER OPERATOR, ASPHALT; RUBBER-TIRED SCRAPER, SELF-LOADING (PADDLE WHEELS, ETC.); RUBBER-TIRED EARTHMOVING EQUIPMENT (SCRAPERS); SLIP FORM PAVER (CONCRETE); SMALL TRACTOR WITH DRAG; SOIL STABILIZER (P&H OR EQUAL); SPIDER PLOW AND SPIDER PULLER; TUBEX PILE RIG; UNLICENSED CONSTRUCTION WORK BOAT OPERATOR, ON SITE; TIMBER SKIDDER; TRACK LOADER UP TO 4 YDS.; TRACTOR-DRAWN SCRAPER; TRACTOR, COMPRESSOR DRILL COMBINATION; WELDER; WOODS-MIXER (AND OTHER SIMILAR

PUGMILL EQUIPMENT) AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 62.57 32.53

OPERATOR: POWER EQUIPMENT, AREA 1: GROUP 5 - CAST-IN-PLACE PIPE LAYING MACHINE; COMBINATION SLUSHER AND MOTOR OPERATOR; CONCRETE CONVEYOR OR CONCRETE PUMP, TRUCK OR EQUIPMENT MOUNTED; CONCRETE CONVEYOR, BUILDING SITE; CONCRETE PUMP OR PUMPCRETE GUN; DRILLING EQUIPMENT, WATSON 2000, TEXOMA 700 OR SIMILAR; DRILLING AND BORING MACHINERY, HORIZONTAL (NOT TO APPLY TO WATERLINES, WAGON DRILLS OR JACKHAMMERS); CONCRETE MIXER/ALL; PERSON AND/OR MATERIAL HOIST; MECHANICAL FINISHERS (CONCRETE-CLARY, JOHNSON, BIDWELL BRIDGE DECK OR SIMILAR TYPES); MECHANICAL BURM, CURB AND/OR CURB AND GUTTER MACHINE (CONCRETE OR ASPHALT); MINE OR SHAFT HOIST; PORTABLE CRUSHER; POWER JUMBO OPERATOR (SETTING SLIP-FORMS, ETC. IN TUNNELS); SCREED (AUTOMATIC OR MANUAL); SELF-PROPELLED COMPACTOR WITH DOZER; TRACTOR WITH BOOM D6 OR SMALLER; TRENCHING MACHINE, MAXIMUM DIGGING CAPACITY OVER 5 FT. DEPTH; VERMEER T-600B ROCK CUTTER OR SIMILAR. AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..$ 61.30 32.53

OPERATOR: POWER EQUIPMENT, AREA 1: GROUP 6 - ARMOR-COATER (OR SIMILAR); BALLAST JACK TAMPER; BOOM-TYPE BACKFILLING MACHINE; ASSISTANT PLANT ENGINEER; BRIDGE AND/OR GANTRY CRANE; CHEMICAL GROUTING MACHINE, TRUCK-MOUNTED; CHIP SPREADING MACHINE OPERATOR; CONCRETE SAW (SELF-PROPELLED UNIT ON STREETS, HIGHWAYS, AIRPORTS AND CANALS); DECK ENGINEER; DRILLING EQUIPMENT TEXOMA 600, HUGHES 200 SERIES OR SIMILAR UP TO AND INCLUDING 30 FT. M.R.C.; DRILL DOCTOR; HELICOPTER RADIO OPERATOR; HYDRO-HAMMER OR SIMILAR; LINE MASTER; SKIDSTEER LOADER, BOBCAT LARGER THAN 743 SERIES OR SIMILAR (WITH ATTACHMENTS); LOCOMOTIVE; LULL HI-LIFT OR SIMILAR; OILER, TRUCK MOUNTED EQUIPMENT; PAVEMENT BREAKER, TRUCK-MOUNTED, WITH COMPRESSOR COMBINATION; PAVING FABRIC INSTALLATION AND/OR LAYING MACHINE; PIPE BENDING MACHINE (PIPELINES ONLY); PIPE WRAPPING MACHINE (TRACTOR PROPELLED AND SUPPORTED); SCREED (EXCEPT ASPHALTIC CONCRETE PAVING); SELF-PROPELLED PIPELINE WRAPPING MACHINE; TRACTOR; SELF-LOADING CHIPPER; CONCRETE BARRIER MOVING MACHINE. AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 59.98 32.53

OPERATOR: POWER EQUIPMENT, AREA 1: GROUP 7 - BALLAST REGULATOR; BOOM TRUCK OR DUAL-PURPOSE A-FRAME TRUCK, NON-ROTATING - UNDER 15 TONS; CARY LIFT OR SIMILAR; COMBINATION SLURRY MIXER AND/OR CLEANER; DRILLING EQUIPMENT, 20 FT. AND UNDER M.R.C.; FIRETENDER (HOT PLANT); GROUTING MACHINE OPERATOR; HIGHLINE CABLEWAY SIGNALPERSON;

STATIONARY BELT LOADER (KOLMAN OR SIMILAR); LIFT SLAB MACHINE (VAGTBORG AND SIMILAR TYPES); MAGINNES INTERNAL FULL SLAB VIBRATOR; MATERIAL HOIST (1 DRUM); MECHANICAL TRENCH SHIELD; PAVEMENT BREAKER (WITH OR WITHOUT COMPRESSOR COMBINATION); PIPE CLEANING MACHINE (TRACTOR PROPELLED AND SUPPORTED); POST DRIVER; ROLLER (EXCEPT ASPHALT); CHIP SEAL; SELF-PROPELLED AUTOMATICALLY APPLIED CONCRETE CURING MACHINE (ON STREETS, HIGHWAYS, AIRPORTS AND CANALS); SELF-PROPELLED COMPACTOR (WITHOUT DOZER); SIGNALPERSON; SLIP-FORM PUMPS (LIFTING DEVICE FOR CONCRETE FORMS); TIE SPACER; TOWER MOBILE; TRENCHING MACHINE, MAXIMUM DIGGING CAPACITY UP TO AND INCLUDING 5 FT. DEPTH; TRUCK-TYPE LOADER. AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..	$ 58.84	32.53
OPERATOR: POWER EQUIPMENT, AREA 1: GROUP 8- BIT SHARPENER; BOILER TENDER; BOX OPERATOR; BRAKEPERSON; COMBINATION MIXER AND COMPRESSOR (SHOTCRETE/GUNITE); COMPRESSOR OPERATOR; DECKHAND; FIRE TENDER; FORKLIFT (UNDER 20 FT); GENERATOR; GUNITE/SHOTCRETE EQUIPMENT OPERATOR; HYDRAULIC MONITOR; KEN SEAL MACHINE (OR SIMILAR); MIXERMOBILE; OILER; PUMP OPERATOR; REFRIGERATION PLANT; RESERVOIR-DEBRIS TUG (SELF-PROPELLED FLOATING); ROSS CARRIER (CONSTRUCTION SITE); ROTOMIST OPERATOR; SELF-PROPELLED TAPE MACHINE; SHUTTLECAR; SELF-PROPELLED POWER SWEEPER OPERATOR (INCLUDES VACUUM SWEEPER); SLUSHER OPERATOR; SURFACE HEATER; SWITCHPERSON; TAR POT FIRETENDER; TUGGER HOIST, SINGLE DRUM; VACUUM COOLING PLANT; WELDING MACHINE (POWERED OTHER THAN BY ELECTRICITY) AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..	$ 57.70	32.53
OPERATOR: POWER EQUIPMENT, AREA 1: GROUP 8-A - ELEVATOR OPERATOR; SKIDSTEER LOADER-BOBCAT 743 SERIES OR SMALLER, AND SIMILAR (WITHOUT ATTACHMENTS); MINI EXCAVATOR UNDER 25 H.P. (BACKHOE-TRENCHER); TUB GRINDER WOOD CHIPPER. AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..	$ 55.49	32.53
OPERATOR: POWER EQUIPMENT, CRANES AND ATTACHMENTS - AREA 1: GROUP 1 - CLAMSHELL AND DRAGLINE OVER 7 CU. YDS.; CRANE, OVER 100 TONS; DERRICK, OVER 100 TONS; DERRICK BARGE PEDESTAL-MOUNTED, OVER 100 TONS; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE, OVER 100 TONS AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER) AREA 1 RECEIVES RATE LISTED. AREA		

2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 68.59 32.53

OPERATOR: POWER EQUIPMENT, CRANES AND ATTACHMENTS - AREA 1: GROUP 2 - CLAMSHELL AND DRAFLINE OVER 1 CU. YD. UP TO AND INCLUDING 7 CU. YDS.; CRANE, OVER 45 TONS UP TO AND INCLUDING 100 TONS; DERRICK BARGE, 100 TONS AND OVER; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE, OVER 45 TONS; TOWER CRANE AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER) AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..$ 66.08 32.53

OPERATOR: POWER EQUIPMENT, CRANES AND ATTACHMENTS - AREA 1: GROUP 3 - CLAMSHELL AND DRAGLINE UP TO AND INCLUDING 1 CU. YD.; CRANES 45 TONS AND UNDER; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE 45 TONS AND UNDER AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER) AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..$ 64.34 32.53

OPERATOR: POWER EQUIPMENT, CRANES AND ATTACHMENTS - AREA 1: GROUP 4 - BOOM TRUCK OR DUAL PURPOSE A-FRAME TRUCK, NON-ROTATING OVER 15 TONS; TRUCK-MOUNTED ROTATING TELESCOPIC BOOM TYPE LIFTING DEVICE, MANITEX OR SIMILAR (BOOM TRUCK) OVER 15 TONS; TRUCK-MOUTNED ROTATING TELESCOPIC BOOM TYPE LIFTING DEVICE, MANITEX OR SIMILAR (BOOM TRUCK) - UNDER 15 TONS. AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER) AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO

COUNTY-REMAINDER).....$ 61.30 32.53
OPERATOR: POWER EQUIPMENT, STEEL ERECTION - AREA 1: GROUP 1 - CRANE OVER 100 TONS; DERRICK OVER 100 TONS; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE OVER 100 TONS.....$ 68.81 32.53
OPERATOR: POWER EQUIPMENT, STEEL ERECTION - AREA 1: GROUP 2 - CRANE OVER 45 TONS TO 100 TONS; DERRICK UNDER 100 TONS; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE OVER 45 TONS TO 100 TONS; TOWER CRANE.....$ 67.04 32.53
OPERATOR: POWER EQUIPMENT, STEEL ERECTION - AREA 1: GROUP 4 - CHICAGO BOOM; FORKLIFT, 10 TONS AND OVER; HEAVY-DUTY REPAIR PERSON/WELDER.....$ 63.54 32.53
OPERATOR: POWER EQUIPMENT, STEEL ERECTION - AREA 1: GROUP 5 - BOOM CAT.....$ 62.24 32.53
OPERATOR: POWER EQUIPMENT, STEEL ERECTION, Cranes - AREA 1: GROUP 3 - CRANE, 45 TONS AND UNDER; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE, 45 TONS AND UNDER.....$ 65.56 32.53
OPERATOR: POWER EQUIPMENT, STEEL ERECTION, Hydraulic - AREA 1: GROUP 3 - CRANE, 45 TONS AND UNDER; SELF-PROPELLED BOOM-TYPE LIFTING DEVICE, 45 TONS AND UNDER.....$ 60.61 32.53
OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: SHAFTS, STOPES, RAISES: (GROUP 1) - HEADING SHIELD OPERATOR; HEAVY-DUTY REPAIRPERSON; MUCKING MACHINE (RUBBER TIRED, RAIL OR TRACK TYPE); RAISED BORE OPERATOR (TUNNELS); TUNNEL MOLE BORE OPERATOR AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 63.06 32.53
OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: SHAFTS, STOPES, RAISES: (GROUP 1-A) - TUNNEL BORE MACHINE OPERATOR, 20; DIAMETER OR MORE AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..$ 65.53 32.53
OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: SHAFTS, STOPES, RAISES: (GROUP 2) - COMBINATION SLUSHER AND MOTOR OPERATOR; CONCRETE PUMP OR PUMPCRETE GUN; POWER JUMBO OPERATOR AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..$ 61.80 32.53
OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: SHAFTS, STOPES, RAISES: (GROUP 3) - DRILL DOCTOR; MINE OR SHAFT HOIST AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 60.47 32.53
OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: SHAFTS, STOPES, RAISES: (GROUP 4) -

COMBINATION SLURRY MIXER CLEANER; GROUTING MACHINE OPERATOR; MOTORMAN AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 59.33 32.53

OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: SHAFTS, STOPES, RAISES: (GROUP 5) - BIT SHARPENER; BRAKEMAN; COMBINATINO MIXER AND COMPRESSOR (GUNITE); COMPRESSOR OPERATOR; OILER; PUMP OPERATOR; SLUSHER OPERATOR AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 58.19 32.53

OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: UNDERGROUND: (GROUP 1) - HEADING SHIELD OPERATOR; HEAVY-DUTY REPAIRPERSON; MUCKING MACHINE (RUBBER TIRED, RAIL OR TRACK TYPE); RAISED BORE OPERATOR (TUNNELS); TUNNEL MOLE BORE OPERATOR AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..$ 62.96 32.53

OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: UNDERGROUND: (GROUP 1-A) - TUNNEL BORE MACHINE OPERATOR, 20; DIAMETER OR MORE AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER)..$ 65.43 32.53

OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: UNDERGROUND: (GROUP 2) - COMBINATION SLUSHER AND MOTOR OPERATOR; CONCRETE PUMP OR PUMPCRETE GUN; POWER JUMBO OPERATOR AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 61.70 32.53

OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: UNDERGROUND: (GROUP 3) - DRILL DOCTOR; MINE OR SHAFT HOIST AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 60.37 32.53

OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: UNDERGROUND: (GROUP 4) - COMBINATION SLURRY MIXER CLEANER; GROUTING MACHINE OPERATOR;

MOTORMAN AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 59.23 32.53
OPERATOR: POWER EQUIPMENT, TUNNEL AND UNDERGROUND WORK - AREA 1: UNDERGROUND: (GROUP 5) - BIT SHARPENER; BRAKEMAN; COMBINATINO MIXER AND COMPRESSOR (GUNITE); COMPRESSOR OPERATOR; OILER; PUMP OPERATOR; SLUSHER OPERATOR AREA 1 RECEIVES RATE LISTED. AREA 2 RECEIVES AND ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MEDOCINO COUNTY-CENTRAL AND SOUTHESTERN PARTS; AREA 2: DEL NORTE COUNTY-REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO COUNTY-REMAINDER).....$ 58.09 32.53

ENGI0003-019 06/30/2025

	Rates	Fringes
OPERATOR: POWER EQUIPMENT, LANDSCAPE WORK ONLY: GROUP 1 - LANDSCAPE FINISH GRADE OPERATOR: ALL FINISH GRADE WORK REGARDLESS OF EQUIPMENT USED, AND ALL EQUIPMENT WITH A RATING MORE THAN 65 HP. (AREA 2: DEL NORTE COUNTY: REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO-REMAINDER).....	$ 57.85	28.56
OPERATOR: POWER EQUIPMENT, LANDSCAPE WORK ONLY: GROUP 1 - LANDSCAPE FINISH GRADE OPERATOR: ALL FINISH GRADE WORK REGARDLESS OF EQUIPMENT USED, AND ALL EQUIPMENT WITH A RATING MORE THAN 65 HP. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MENDOCINO COUNTY-CENTRAL AND SOUTHEASTERN PARTS.).....	$ 55.85	28.56
OPERATOR: POWER EQUIPMENT, LANDSCAPE WORK ONLY: GROUP 2 - LANDSCAPE OPERATOR UP TO 65 HP: ALL EQUIPMENT WITH A MANUFACTURER'S RATING OF 65 HP OR LESS EXCEPT EQUIPMENT COVERED BY 1 OR GROUP 3. THE FOLLOWING EQUIPMENT SHALL BE INCLUDED EXCEPT WHEN USED FOR FINISH WORK AS LONG AS MANUFACTURER'S RATING IS 65 HP OR LESS; A-FRAME AND WINCH TRUCK, BACKHOE, FORKLIFT, HYDRAGRAPHIC SEEDER MACHINE, ROLLER, RUBBER-TIRED AND TRACK EARTHMOVING EQUIPMENT, SKIPLOADER, STRAW BLOWERS, AND TRENCHER 31 HP UP TO 65 HP. (AREA 2: DEL NORTE COUNTY: REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO-REMAINDER).....	$ 54.25	28.56
OPERATOR: POWER EQUIPMENT, LANDSCAPE WORK ONLY: GROUP 2 - LANDSCAPE OPERATOR UP TO 65 HP: ALL EQUIPMENT WITH A MANUFACTURER'S RATING OF 65 HP OR LESS EXCEPT EQUIPMENT COVERED BY 1 OR GROUP 3. THE FOLLOWING EQUIPMENT SHALL BE INCLUDED EXCEPT WHEN USED FOR FINISH WORK AS LONG AS MANUFACTURER'S RATING IS 65 HP OR LESS; A-FRAME AND WINCH TRUCK, BACKHOE, FORKLIFT, HYDRAGRAPHIC SEEDER MACHINE, ROLLER, RUBBER-TIRED AND TRACK EARTHMOVING EQUIPMENT, SKIPLOADER, STRAW BLOWERS, AND TRENCHER 31 HP UP TO 65 HP(AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN PARTS, LAKE COUNTY-SOUTHERN PART, MENDOCINO COUNTY-CENTRAL AND SOUTHEASTERN PARTS)....$ 52.25	28.56
OPERATOR: POWER EQUIPMENT, LANDSCAPE WORK ONLY: GROUP 3 - LANDSCAPE UTILITY OPERATION: SMALL RUBBER-TIRED TRACTOR, TRENCHER UNDER 31 HP. (AREA 1: DEL NORTE COUNTY-EXTREME SOUTHWEST CORNER, HUMBOLDT COUNTY-EXCEPT EASTERN AND SOUTHWESTERN		

PARTS, LAKE COUNTY-SOUTHERN PART, MENDOCINO COUNTY-CENTRAL AND SOUTHEASTERN PARTS).....$ 47.64 28.56
OPERATOR: POWER EQUIPMENT, LANDSCAPE WORK ONLY: GROUP 3 - LANDSCAPE UTILITY OPERATION: SMALL RUBBER-TIRED TRACTOR, TRENCHER UNDER 31 HP. (AREA 2: DEL NORTE COUNTY: REMAINDER, HUMBOLDT COUNTY-REMAINDER, LAKE COUNTY-REMAINDER, MENDOCINO-REMAINDER).....$ 49.64 28.56

IRON0377-004 01/01/2025

	Rates	Fringes
IRONWORKERS: FENCE ERECTOR PREMIUM PAY: $6.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: CHINA LAKE NAVAL TEST STATION, CHOCOLATE MOUNTAINS NAVAL RESERVE-NILAND, EDWARDS AFB, FORT IRWIN MILITARY STATION, FORT IRWIN TRAINING CENTER-GOLDSTONE, SAN CLEMENTE ISLAND, SAN NICHOLAS ISLAND, SUSANVILLE FEDERAL PRISON, 29 PALMS-MARINE CORPS, U.S. MARINE BASE-BARSTOW, U.S. NAVAL AIR FACILITY-SEALEY, VANDENBERG AFB. $4.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: ARMY DEFENSE LANGUAGE INSTITUTE-MONTEREY, FALLON AIR FORCE BASE, NAVAL POST GRADUATE SCHOOL-MONTEREY, YERMO MARINE CORPS LOGISTICS CENTER. $2.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: PORT HUENEME, PORT MUGU, U.S. COST GUARD STATION-TWO ROCK (DEL NORTE COUNTY)	$ 45.78	26.51
IRONWORKERS: ORNAMENTAL, REINFORCING AND STRUCTURAL PREMIUM PAY: $6.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: CHINA LAKE NAVAL TEST STATION, CHOCOLATE MOUNTAINS NAVAL RESERVE-NILAND, EDWARDS AFB, FORT IRWIN MILITARY STATION, FORT IRWIN TRAINING CENTER-GOLDSTONE, SAN CLEMENTE ISLAND, SAN NICHOLAS ISLAND, SUSANVILLE FEDERAL PRISON, 29 PALMS-MARINE CORPS, U.S. MARINE BASE-BARSTOW, U.S. NAVAL AIR FACILITY-SEALEY, VANDENBERG AFB. $4.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: ARMY DEFENSE LANGUAGE INSTITUTE-MONTEREY, FALLON AIR FORCE BASE, NAVAL POST GRADUATE SCHOOL-MONTEREY, YERMO MARINE CORPS LOGISTICS CENTER. $2.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: PORT HUENEME, PORT MUGU, U.S. COST GUARD STATION-TWO ROCK (DEL NORTE COUNTY)	$ 43.75	34.45

IRON0377-005 01/01/2025

	Rates	Fringes
IRONWORKERS: FENCE ERECTOR PREMIUM PAY: $6.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: CHINA LAKE NAVAL TEST STATION, CHOCOLATE MOUNTAINS NAVAL RESERVE-NILAND, EDWARDS AFB, FORT IRWIN MILITARY STATION, FORT IRWIN TRAINING CENTER-GOLDSTONE, SAN CLEMENTE ISLAND, SAN NICHOLAS ISLAND, SUSANVILLE FEDERAL PRISON, 29 PALMS-MARINE CORPS, U.S. MARINE BASE-BARSTOW, U.S. NAVAL AIR FACILITY-SEALEY, VANDENBERG AFB. $4.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: ARMY DEFENSE LANGUAGE INSTITUTE-MONTEREY, FALLON AIR FORCE BASE, NAVAL POST GRADUATE SCHOOL-MONTEREY, YERMO MARINE CORPS LOGISTICS CENTER. $2.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: PORT HUENEME, PORT MUGU, U.S. COST GUARD STATION-TWO ROCK (HUMBOLDT, LAKE, AND MENDOCINO COUNTIES)	$ 45.78	26.51
IRONWORKERS: ORNAMENTAL, REINFORCING AND STRUCTURAL PREMIUM PAY: $6.00 ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS: CHINA LAKE NAVAL TEST STATION, CHOCOLATE MOUNTAINS NAVAL RESERVE-NILAND, EDWARDS AFB, FORT IRWIN MILITARY STATION, FORT IRWIN TRAINING CENTER-GOLDSTONE, SAN CLEMENTE ISLAND, SAN NICHOLAS ISLAND, SUSANVILLE FEDERAL PRISON, 29 PALMS-MARINE CORPS, U.S. MARINE BASE-BARSTOW, U.S. NAVAL AIR FACILITY-SEALEY, VANDENBERG AFB. $4.00		

ADDITIONAL PER HOUR AT THE FOLLOWING LOCATIONS:
ARMY DEFENSE LANGUAGE INSTITUTE-MONTEREY, FALLON
AIR FORCE BASE, NAVAL POST GRADUATE
SCHOOL-MONTEREY, YERMO MARINE CORPS LOGISTICS
CENTER. $2.00 ADDITIONAL PER HOUR AT THE FOLLOWING
LOCATIONS: PORT HUENEME, PORT MUGU, U.S. COST GUARD
STATION-TWO ROCK (HUMBOLDT, LAKE, AND MENDOCINO
COUNTIES).....$ 50.70 35.15

LABO0324-003 07/01/2023

	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE): ESCORT DRIVER, FLAG PERSON (DEL NORTE, HUMBOLDT, LAKE, AND MENDOCINO COUNTIES)	$ 36.26	27.30
LABORER (TRAFFIC CONTROL/LANE CLOSURE): TRAFFIC CONTROL PERSON I: LAYOUT OF TRAFFIC CONTROL, CRASH CUSHIONS, CONSTRUCTION AREA AND ROADSIDE SIGNAGE. (DEL NORTE, HUMBOLDT, LAKE, AND MENDOCINO COUNTIES)	$ 36.56	27.30
LABORER (TRAFFIC CONTROL/LANE CLOSURE): TRAFFIC CONTROL PERSON II: INSTALLATION AND REMOVAL OF TEMPORARY/PERMANENT SIGNS, MARKERS, DELINEATORS AND CRASH CUSHIONS. (DEL NORTE, HUMBOLDT, LAKE, AND MENDOCINO COUNTIES)	$ 34.06	27.30

LABO0324-005 06/26/2023

	Rates	Fringes
GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS (Establishment Warranty Period)	$ 28.94	27.30
GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS (New Construction)	$ 35.25	27.30
LABORERS: CONSTRUCTION CRAFT LABORERS: CONSTRUCTION SPECIALIST GROUP ASPHALT IRONER AND RAKER; CHAINSAW; LASER BEAM IN CONNECTION WITH LABORERS' WORK; MASONRY AND PLASTERER TENDER; CAST-IN-PLACE MANHOLE FORM SETTER; PRESSURE PIPELAYER; DAVIS TRENCHER - 300 OR SIMILAR TYPE (AND ALL SMALL TRENCHERS); BLASTER; DIAMOND DRILLER; MULTIPLE UNIT DRILL; HYDRAULIC DRILL FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. SEWER CLEANERS SHALL RECEIVE $4.00 PER DAY ABOVE GROUP 1 WAGE RATES. ""SEWER CLEANER"" MEANS ANY WORKER WHO HANDLES OR COMES IN CONTACT WITH RAW SEWAGE IN SMALL DIAMETER SEWERS. THOSE WHO WORK INSIDE RECENTLY ACTIVE, LARGE DIAMETER SEWERS, AND ALL RECENTLY ACTIVE SEWER MANHOLES, SHALL RECEIVE $5.00 PER DAY ABOVE GROUP 1 WAGE RATES. MAINTENANCE AND REPAIR TRACK AND ROAD BEDS (UNDERGROUND STRUCTURES). ALL EMPLOYEES PERFORMING WORK COVERED HEREIN SHALL RECEIVE $ .25 PER HOUR ABOVE THEIR REGULAR RATE FOR ALL WORK PERFORMED ON UNDERGROUND STRUCTURES NOT SPECIFICALLY COVERED HEREIN. THIS PARAGRAPH SHALL NOT BE CONSTRUED TO APPLY TO WORK BELOW GROUND LEVEL IN OPEN CUT. IT SHALL APPLY TO CUT AND COVER WORK OF SUBWAY CONSTRUCTION AFTER THE TEMPORARY COVER HAS BEEN PLACED.	$ 36.20	27.30
LABORERS:, CONSTRUCTION CRAFT LABORERS: GROUP 1: ASPHALT SPREADER BOXES (ALL TYPES); BARKO, WACKER AND SIMILAR TYPE TAMPERS; BUGGYMOBILE; CAULKER, BANDER, PIPEWRAPPER, CONDUIT LAYER, PLASTIC PIPELAYER; CERTIFIED HAZARDOUS WASTE WORKER; COMPACTORS OF ALL TYPES; CONCRETE AND MAGNESITE MIXER, 1/2 YD. AND UNDER; CONCRETE PAN WORK; CONCRETE SANDER; CONCRETE SAW; CRIBBER AND/OR SHORING; CUT GRANITE CURB SETTER; DRI-PAK-IT MACHINE; FALLER, LOGLOADER AND BUCKER; FORM RAISER, SLIP FORMS; GREEN CUTTER; HEADERBOARD, HUBSETTER, ALIGNER, BY ANY METHOD; HIGH PRESSURE BLOW PIPE		

(1-1/2"" OR OVER, 100 LBS. PRESSURE/OVER); HYDRO SEEDER AND SIMILAR YPE; JACKHAMMER OPERATOR; JACKING OF PIPE OVER 12 INCHES; JACKSON AND SIMILAR TYPE COMPACTOR; KETTLE TENDER, POT AND WORKER APPLYING ASPHALT, LAY-KOLD, CREOSOTE, LIME, CAUSTIC AND SIMILAR TYPE MATERIALS (APPLYING MEANS APPLYING, DIPPING OR HANDLING OF SUCH MATERIALS); LAGGING, SHEETING, WHALING, BRACING, TRENCHJACKING, LAGGING HAMMER; MAGNESITE, EPOXYRESIN, FIBERGLASS, MASTIC WORKER (WET OR DRY); NO JOINT PIPE AND STRIPPING OF SAME, INCLUDING REPAIR OF VOIDS; PAVEMENT BREAKER AND SPADER, INCLUDING TOOL GRINDER; PERMA CURB; PIPELAYER (INCLUDING GRADE CHECKING IN CONNECTION WITH PIPELAYING); PRECAST-MANHOLE SETTER; PRESSURE PIPE TESTER; POST HOLE DIGGER, AIR, GAS AND ELECTRIC; POWER BROOM SWEEPER; POWER TAMPERS OF ALL TYPES (EXCEPT AS SHOWN IN GROUP 2); RAM SET GUN AND STUD GUN; RIPRAP STONEPAVER AND ROCK-SLINGER, INCLUDING PLACING OF SACKED CONCRETE AND/OR SAND (WET OR DRY) AND GABIONS AND SIMILAR TYPE; ROTARY SCARIFIER OR MULTIPLE HEAD CONCRETE CHIPPING SCARIFIER; ROTO AND DITCH WITCH; ROTOTILLER; SANDBLASTER, POT, GUN, NOZZLE OPERATORS; SIGNALLING AND RIGGING; TANK CLEANER; TREE CLIMBER; TURBO BLASTER; VIBRASCREED, BULL FLOAT IN CONNECTION WITH LABORERS' WORK; VIBRATOR FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. GROUP 1-B: SEWER CLEANERS SHALL RECEIVE $4.00 PER DAY ABOVE GROUP 1 WAGE RATES. ""SEWER CLEANER"" MEANS ANY WORKER WHO HANDLES OR COMES IN CONTACT WITH RAW SEWAGE IN SMALL DIAMETER SEWERS. THOSE WHO WORK INSIDE RECENTLY ACTIVE, LARGE DIAMETER SEWERS, AND ALL RECENTLY ACTIVE SEWER MANHOLES, SHALL RECEIVE $5.00 PER DAY ABOVE GROUP 1 WAGE RATES. GROUP 1-D: MAINTENANCE AND REPAIR TRACK AND ROAD BEDS (UNDERGROUND STRUCTURES). ALL EMPLOYEES PERFORMING WORK COVERED HEREIN SHALL RECEIVE $0.25 PER HOUR ABOVE THEIR REGUALR RATE FOR ALL WORK PERFORMED ON UNDERGROUND STRUCTURES NOT SPECIFICALLY COVERED HEREIN. THIS PARAGRPAH SHALL NOT BE CONSTRUED TO APPLY TO WORK BELOW GROUND LEVEL IN OPEN CUT. IT SHALL APPLY TO CUT AND COVER WORK OF SUBWAY CONSTRUCTION AFTER THE TEMPORARY COVER HAS BEEN PLACED. .....$ 35.50 27.30

LABORERS:, CONSTRUCTION CRAFT LABORERS: GROUP 1-A: JOY DRILL MODEL TWM-2A; GARDNER-DENVER MODEL DH143 AND SIMILAR TYPE DRILLS; TRACK DRILLER; JACK LEG DRILLER; WAGON DRILLER; MECHANICAL DRILLERS, ALL TYPES REGARDLESS OF TYPE OR METHOD OF POWER; MECHANICAL PIPE LAYERS, ALL TYPES REGARDLESS OF TYPE OR METHOD OF POWER; BLASTER AND POWDER; ALL WORK OF LOADING, PLACING AND BLASTING OF ALL POWDER AND EXPLOSIVES OF WHATEVER TYPE REGARDLESS OF METHOD USED FOR SUCH LOADING AND PLACING; HIGH SCALERS (INCLUDING DRILLING OF SAME); TREE TOPPER; BIT GRINDER FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. GROUP 1-D: MAINTENANCE AND REPAIR TRACK AND ROAD BEDS (UNDERGROUND STRUCTURES). ALL EMPLOYEES PERFORMING WORK COVERED HEREIN SHALL RECEIVE $0.25 PER HOUR ABOVE THEIR REGUALR RATE FOR ALL WORK PERFORMED ON UNDERGROUND STRUCTURES NOT SPECIFICALLY COVERED HEREIN. THIS PARAGRPAH SHALL NOT BE CONSTRUED TO APPLY TO WORK BELOW GROUND LEVEL IN OPEN CUT. IT SHALL APPLY TO CUT AND COVER WORK OF SUBWAY CONSTRUCTION AFTER THE TEMPORARY COVER HAS BEEN

PLACED. .....$ 35.72 27.30
LABORERS:, CONSTRUCTION CRAFT LABORERS: GROUP 1-C: BURNING AND WELDING IN CONNECTION WITH LABORERS' WORK; SYNTHETIC THERMOPLASTICS AND SIMILAR TYPE WELDING FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. GROUP 1-D: MAINTENANCE AND REPAIR TRACK AND ROAD BEDS (UNDERGROUND STRUCTURES). ALL EMPLOYEES PERFORMING WORK COVERED HEREIN SHALL RECEIVE $0.25 PER HOUR ABOVE THEIR REGUALR RATE FOR ALL WORK PERFORMED ON UNDERGROUND STRUCTURES NOT SPECIFICALLY COVERED HEREIN. THIS PARAGRPAH SHALL NOT BE CONSTRUED TO APPLY TO WORK BELOW GROUND LEVEL IN OPEN CUT. IT SHALL APPLY TO CUT AND COVER WORK OF SUBWAY CONSTRUCTION AFTER THE TEMPORARY COVER HAS BEEN PLACED. .....$ 35.55 27.30
LABORERS:, CONSTRUCTION CRAFT LABORERS: GROUP 1-E: WORK ON AND/OR IN BELL HOLE FOOTINGS AND SHAFTS THEREOF, AND WORK ON AND IN DEEP FOOTINGS. (A DEEP FOOTING IS A HOLE 15 FEET OR MORE IN DEPTH.) IN THE EVENT THE DEPTH OF THE FOOTING IS UNKNOWN AT THE COMMENCEMENT OF EXCAVATION, AND THE FINAL DEPTH EXCEEDS 15 FEET, THE DEEP FOOTING WAGE RATE WOULD APPLY TO ALL EMPLOYEES FOR EACH AND EVERY DAY WORKED ON OR IN THE EXCAVATION OF THE FOOTING FROM THE DATE OF INCEPTION. FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. GROUP 1-D: MAINTENANCE AND REPAIR TRACK AND ROAD BEDS (UNDERGROUND STRUCTURES). ALL EMPLOYEES PERFORMING WORK COVERED HEREIN SHALL RECEIVE $0.25 PER HOUR ABOVE THEIR REGUALR RATE FOR ALL WORK PERFORMED ON UNDERGROUND STRUCTURES NOT SPECIFICALLY COVERED HEREIN. THIS PARAGRPAH SHALL NOT BE CONSTRUED TO APPLY TO WORK BELOW GROUND LEVEL IN OPEN CUT. IT SHALL APPLY TO CUT AND COVER WORK OF SUBWAY CONSTRUCTION AFTER THE TEMPORARY COVER HAS BEEN PLACED. .....$ 36.05 27.30
LABORERS:, CONSTRUCTION CRAFT LABORERS: GROUP 1-F: WIRE WINDING MACHINE IN CONNECTION WITH GUNITING OR SHOT CRETE FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. GROUP 1-D: MAINTENANCE AND REPAIR TRACK AND ROAD BEDS (UNDERGROUND STRUCTURES). ALL EMPLOYEES PERFORMING WORK COVERED HEREIN SHALL RECEIVE $0.25 PER HOUR ABOVE THEIR REGUALR RATE FOR ALL WORK PERFORMED ON UNDERGROUND STRUCTURES NOT SPECIFICALLY COVERED HEREIN. THIS PARAGRPAH SHALL NOT BE CONSTRUED TO APPLY TO WORK BELOW GROUND LEVEL IN OPEN CUT. IT SHALL APPLY TO CUT AND COVER WORK OF SUBWAY CONSTRUCTION AFTER THE TEMPORARY COVER HAS BEEN PLACED.
.....$ 36.08 27.30
LABORERS:, CONSTRUCTION CRAFT LABORERS: GROUP 2: ASPHALT SHOVELER; CEMENT DUMPER AND HANDLING DRY CEMENT OR GYPSUM; CHOKE-SETTER AND RIGGER (CLEARING WORK); CONCRETE BUCKET DUMPER AND CHUTE; CONCRETE CHIPPING AND GRINDING; CONCRETE LABORER (WET OR DRY); DRILLER TENDER, CHUCK TENDER, NIPPER; GUINEA CHASER (STAKE), GROUT CREW; HIGH PRESSURE NOZZLE, ADDUCTOR; HYDRAULIC MONITOR (OVER 100 LBS. PRESSURE); LOADING AND UNLOADING, CARRYING AND HAULING OF ALL RODS AND MATERIALS FOR USE IN REINFORCING CONCRETE CONSTRUCTION; PITTSBURGH CHIPPER AND SIMILAR TYPE BRUSH SHREDDERS; SLOPER; SINGLE FOOT, HAND-HELD, PNEUMATIC TAMPER; ALL PNEUMATIC, AIR, GAS AND ELECTRIC TOOLS NOT LISTED

IN GROUPS 1 THROUGH 1-F; JACKING OF PIPE - UNDER 12 INCHES FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. GROUP 1-D: MAINTENANCE AND REPAIR TRACK AND ROAD BEDS (UNDERGROUND STRUCTURES). ALL EMPLOYEES PERFORMING WORK COVERED HEREIN SHALL RECEIVE $0.25 PER HOUR ABOVE THEIR REGUALR RATE FOR ALL WORK PERFORMED ON UNDERGROUND STRUCTURES NOT SPECIFICALLY COVERED HEREIN. THIS PARAGRPAH SHALL NOT BE CONSTRUED TO APPLY TO WORK BELOW GROUND LEVEL IN OPEN CUT. IT SHALL APPLY TO CUT AND COVER WORK OF SUBWAY CONSTRUCTION AFTER THE TEMPORARY COVER HAS BEEN PLACED.
..... $ 35.35 27.30

LABORERS:, CONSTRUCTION CRAFT LABORERS: GROUP 3: CONSTRUCTION LABORERS, INCLUDING BRIDGE AND GENERAL LABORER; DUMP, LOAD SPOTTER; FLAG PERSON; FIRE WATCHER; FENCE ERECTOR; GUARDRAIL ERECTOR; GARDENER, HORTICULTURAL AND LANDSCAPE LABORER; JETTING; LIMBER, BRUSH LOADER AND PILER; PAVEMENT MARKER (BUTTON SETTER); MAINTENANCE, REPAIR TRACK AND ROAD BEDS; STREETCAR AND RAILROAD CONSTRUCTION TRACK LABORER; TEMPORARY AIR AND WATER LINES, VICTAULIC OR SIMILAR; TOOL ROOM ATTENDANT (JOBSITE ONLY) FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. GROUP 1-D: MAINTENANCE AND REPAIR TRACK AND ROAD BEDS (UNDERGROUND STRUCTURES). ALL EMPLOYEES PERFORMING WORK COVERED HEREIN SHALL RECEIVE $0.25 PER HOUR ABOVE THEIR REGUALR RATE FOR ALL WORK PERFORMED ON UNDERGROUND STRUCTURES NOT SPECIFICALLY COVERED HEREIN. THIS PARAGRPAH SHALL NOT BE CONSTRUED TO APPLY TO WORK BELOW GROUND LEVEL IN OPEN CUT. IT SHALL APPLY TO CUT AND COVER WORK OF SUBWAY CONSTRUCTION AFTER THE TEMPORARY COVER HAS BEEN PLACED. $ 35.25 27.30

LABORERS:, CONSTRUCTION CRAFT LABORERS: GROUP 4: ALL CLEAN-UP WORK OF DEBRIS, GROUNDS AND BUILDING INCLUDING BUT NOT LIMITED TO: STREET CLEANER; CLEANING AND WASHING WINDOWS; BRICK CLEANER (JOBSITE ONLY); MATERIAL CLEANER (JOBSITE ONLY). THE CLASSIFICATION ""MATERIAL CLEANER"" IS TO BE UTILIZED UNDER THE FOLLOWING CONDITIONS: A: AT DEMOLITION SITE FOR THE SALVAGE OF THE MATERIAL. B: AT THE CONCLUSION OF A JOB WHERE THE MATERIAL IS TO BE SALVAGED AND STOCKED TO BE REUSED ON ANOTHER JOB. C: FOR THE CLEANING OF SALVAGE MATERIAL AT THE JOBSITE OR TEMPORARY JOBSITE YARD. THE MATERIAL CLEANER CLASSIFICATION SHOULD NOT BE USED IN THE PERFORMANCE OF ""FORM STRIPPING, CLEANING AND OILING AND MOVING TO THE NEXT POINT OF ERECTION"". FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. GROUP 1-D: MAINTENANCE AND REPAIR TRACK AND ROAD BEDS (UNDERGROUND STRUCTURES). ALL EMPLOYEES PERFORMING WORK COVERED HEREIN SHALL RECEIVE $0.25 PER HOUR ABOVE THEIR REGUALR RATE FOR ALL WORK PERFORMED ON UNDERGROUND STRUCTURES NOT SPECIFICALLY COVERED HEREIN. THIS PARAGRPAH SHALL NOT BE CONSTRUED TO APPLY TO WORK BELOW GROUND LEVEL IN OPEN CUT. IT SHALL APPLY TO CUT AND COVER WORK OF SUBWAY CONSTRUCTION AFTER THE TEMPORARY COVER HAS BEEN PLACED.
..... $ 28.94 27.30

LABORERS:, GUNITE: GROUP 3: REBOUNDMAN FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT

APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL.....$ 35.37 27.30

LABORERS:, GUNITE: GROUP 1: STRUCTURAL NOZZLEMAN FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL.....$ 36.46 27.30

LABORERS:, GUNITE: GROUP 2: NOZZLEMAN, GUNMAN, POTMAN, GROUNDMAN FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. .$ 35.96 27.30

LABORERS:, GUNITE: GROUP 4: GUNITE LABORER FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL.....$ 35.25 27.30

LABORERS:, WRECKING: GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials) FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. .....$ 35.50 27.30

LABORERS:, WRECKING: GROUP 2: Semi-skilled wrecker (salvaging of other building materials) FOOTNOTES: LABORERS WORKING OFF OR WITH OR FROM BOS'N CHAIRS, SWINGING SCAFFOLDS, BELTS (NOT APPLICABLE TO WORKERS ENTITLED TO RECEIVE THE WAGE RATE SET FORTH IN GROUP 1-A): $0.25 PER HOUR ADDITIONAL. $ 35.35 27.30

LABO0324-007 06/26/2023

	Rates	Fringes
TUNNEL AND SHAFT LABORERS: GROUP 1- DIAMOND DRILLER; GROUNDMEN; GUNITE AND SHOTCRETE NOZZLEMEN (DEL NORTE, HUMBOLDT, LAKE, AND MENDOCINO COUNTIES).	$ 45.89	27.72
TUNNEL AND SHAFT LABORERS: GROUP 2- RODMEN; SHAFT WORK & RAISE (BELOW ACTUAL OR EXCAVATED GROUND LEVEL) (DEL NORTE, HUMBOLDT, LAKE, AND MENDOCINO COUNTIES).....	$ 45.66	27.72
TUNNEL AND SHAFT LABORERS: GROUP 3- BIT GRINDER; BLASTER, DRILLER, POWDERMEN, HEADING; CHERRY PICKERMEN - WHERE CAR IS LIFTED; CONCRETE FINISHER IN TUNNEL; CONCRETE SCREEDMAN; GROUT PUMPMAN AND POTMAN; GUNITE & SHOTCRETE GUNMAN & POTMAN; HEADERMEN; HIGH PRESSURE NOZZLEMAN; MINER - TUNNEL, INCLUDING TOP AND BOTTOM MAN ON SHAFT AND RAISE WORK; NIPPER; NOZZLEMAN ON SLICK LINE; SANDBLASTER - POTMAN, ROBOTIC SHOTCRETE PLACER, SEGMENT ERECTOR, TUNNEL MUCK HAULER, STEEL FORM RAISER AND SETTER; TIMBERMAN, RETIMBERMAN (WOOD OR STEEL OR SUBSTITUTE MATERIALS THEREFORE); TUGGER (FOR TUNNEL LABORER WORK); CABLE TENDER; CHUCK TENDER; POWDERMAN - PRIMER HOUSE (DEL NORTE, HUMBOLDT, LAKE, AND MENDOCINO COUNTIES).....	$ 45.41	27.72
TUNNEL AND SHAFT LABORERS: GROUP 4- VIBRATOR OPERATOR, PAVEMENT BREAKER; BULL GANG - MUCKERS, TRACKMEN; CONCRETE CREW - INCLUDES RODDING AND SPREADING, DUMPMEN (ANY METHOD) (DEL NORTE, HUMBOLDT, LAKE, AND MENDOCINO COUNTIES).....	$ 44.96	27.72
TUNNEL AND SHAFT LABORERS: GROUP 5- GROUT CREW; REBOUNDMAN; SWAMPER/ BRAKEMAN (DEL NORTE, HUMBOLDT, LAKE, AND MENDOCINO COUNTIES).....	$ 44.42	27.72
TUNNEL AND SHAFT LABORERS: SHOTCRETE SPECIALIST (DEL NORTE, HUMBOLDT, LAKE, AND MENDOCINO COUNTIES).	$ 46.41	27.72

LABO0324-009 07/01/2023

	Rates	Fringes
LABORER: MASON TENDER-BRICK (DEL NORTE, HUMBOLDT, LAKE, MENDOCINO, NAPA, SOLANO, AND SONOMA COUNTIES) FOOTNOTE: REFRACTORY WORK WHERE HEAT-PROTECTIVE CLOTHING IS REQUIRED: $2.00 PER HOUR ADDITIONAL.....	$ 36.84	26.24

PAIN0016-021 01/01/2025

	Rates	Fringes
PAINTERS (LAKE AND MENDOCINO COUNTIES).....	$ 53.38	28.04

PAIN1034-001 06/01/1993

	Rates	Fringes
PAINTERS: BRUSH & ROLLER (DEL NORTE AND HUMBOLDT COUNTIES).....	$ 13.35	2.94
PAINTERS: SANDBLASTER, SPRAY, STRUCTURAL STEEL & SWING STAGE (DEL NORTE AND HUMBOLDT COUNTIES).....	$ 13.60	2.94

PAIN1176-001 07/01/2022

	Rates	Fringes
PARKING LOT STRIPING/HIGHWAY MARKING: HIGHWAY IMPROVEMEMT: GROUP 2 GAMECOURT & PLAYGROUND INSTALLER.....	$ 34.71	17.62
PARKING LOT STRIPING/HIGHWAY MARKING: HIGHWAY IMPROVEMENT: GROUP 1 STRIPER: LAYOUT AND APPLICATION OF PAINTED TRAFFIC STRIPES AND MARKING; HOT THERMO PLASTIC; TAPE, TRAFFIC STRIPES AND MARKINGS.....	$ 40.83	17.62
PARKING LOT STRIPING/HIGHWAY MARKING: HIGHWAY IMPROVEMENT: GROUP 3 PROTECTIVE COATING, PAVEMENT SEALING.....	$ 35.11	17.62

PLAS0300-005 07/01/2016

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER.....	$ 32.15	23.27

PLUM0038-004 07/01/2025

	Rates	Fringes
LANDSCAPE/IRRIGATION FITTER: UNDERGROUND/UTLIITY FITTER (LAKE AND MENDOCINO COUNTIES).....	$ 77.35	36.53
PLUMBER: ALL OTHER WORK - NEW CONSTRUCTION RATE (LAKE AND MENDOCINO COUNTIES).....	$ 91.00	49.40
PLUMBER: WORK ON WOODEN FRAME STRUCTURES 5 SOTIRES OR LESS EXCLUDING HIGH-RISE BUILDINGS AND COMMERCIAL WORK SUCH AS HOSPITALS, PRISONS, HOTELS, SCHOOLS, CASINOS, WASTEWATER TREATMENT PLANTS, AND RESEARCH FACILITIES AS WELL AS REFRIGERATION PIPEFITTING, SERVICE AND REPAIR WORK - MARKET RECOVER RATE (LAKE AND MENDOCINO COUNTIES).....	$ 69.70	46.38

PLUM0355-005 07/01/2025

	Rates	Fringes
UNDERGROUND UTILITY WORKER: LANDSCAPE FITTER (DEL NORTE AND HUMBOLDT COUNTIES).....	$ 36.01	18.50

SHEE0104-016 06/29/2026

	Rates	Fringes
SHEET METAL WORKER (ALL OTHER WORK).....	$ 86.31	46.75
SHEET METAL WORKER (MECHANICAL CONTRACTS $200,000 OR LESS).....	$ 73.19	46.00

TEAM0094-001 07/01/2025

	Rates	Fringes
TRUCK DRIVERS: GROUP 1: DUMP TRUCKS, UNDER 6 YDS.; SINGLE UNIT FLAT RACK (2- AXLE UNIT); NIPPER TRUCK (WHEN FLAT RACK TRUCK IS USED APPROPRIATE FLAT RACK		

SHALL APPLY); CONCRETE PUMP TRUCK (WHEN FLAT RACK TRUCK IS USED APPROPRIATE FLAT RACK SHALL APPLY); CONCRETE PUMP MACHINE; FORK LIFT AND LIFT JITNEYS; FUEL AND/OR GREASE TRUCK DRIVER OR FUEL PERSON; SNOW BUGGY; STEAM CLEANING; BUS OR PERSONHAUL DRIVER; ESCORT OR PILOT CAR DRIVER; PICKUP TRUCK; TEAMSTER OILER/GREASER AND/OR SERVICEPERSON; HOOK TENDER (INCLUDING LOADING AND UNLOADING); TEAM DRIVER; TOOL ROOM ATTENDANT (REFINERIES)
FOOTNOTES: ARTICULATED DUMP TRUCK; BULK CEMENT SPREADER (WITH OR WITHOUT AUGER); DUMPCRETE TRUCK; SKID TRUCK (DEBRIS BOX); DRY PRE-BATCH CONCRETE MIX TRUCKS; DUMPSTER OR SIMILAR TYPE; SLURRY TRUCK: USE DUMP TRUCK YARDAGE RATE. HEATER PLANER; ASPHALT BURNER; SCARIFIER BURNER; INDUSTRIAL LIFT TRUCK (MECHANICAL TAILGATE); UTILITY AND CLEAN-UP TRUCK: USE APPROPRIATE RATE FOR THE POWER UNIT OR THE EQUIPMENT UTILIZED. .....$ 43.26 34.28

TRUCK DRIVERS: GROUP 2: DUMP TRUCKS, 6 YDS. AND UNDER 8 YDS.; TRANSIT MIXERS, THROUGH 10 YDS.; WATER TRUCKS, UNDER 7,000 GALS.; JETTING TRUCKS, UNDER 7,000 GALS.; SINGLE-UNIT FLAT RACK (3-AXLE UNIT); HIGHBED HEAVY DUTY TRANSPORT; SCISSOR TRUCK; RUBBER-TIRED MUCK CAR (NOT SELF-LOADED); RUBBER-TIRED TRUCK JUMBO; WINCH TRUCK AND ""A"" FRAME DRIVERS; COMBINATION WINCH TRUCK WITH HOIST; ROAD OIL TRUCK OR BOOTPERSON; BUGGYMOBILE; ROSS, HYSTER AND SIMILAR STRADDLE CARRIERS; SMALL RUBBER-TIRED TRACTOR FOOTNOTES: ARTICULATED DUMP TRUCK; BULK CEMENT SPREADER (WITH OR WITHOUT AUGER); DUMPCRETE TRUCK; SKID TRUCK (DEBRIS BOX); DRY PRE-BATCH CONCRETE MIX TRUCKS; DUMPSTER OR SIMILAR TYPE; SLURRY TRUCK: USE DUMP TRUCK YARDAGE RATE. HEATER PLANER; ASPHALT BURNER; SCARIFIER BURNER; INDUSTRIAL LIFT TRUCK (MECHANICAL TAILGATE); UTILITY AND CLEAN-UP TRUCK: USE APPROPRIATE RATE FOR THE POWER UNIT OR THE EQUIPMENT UTILIZED.
.....$ 43.56 34.28

TRUCK DRIVERS: GROUP 3: DUMP TRUCKS, 8 YDS. AND INCLUDING 24 YDS.; TRANSIT MIXERS, OVER 10 YDS.; WATER TRUCKS, 7,000 GALS. AND OVER; JETTING TRUCKS, 7,000 GALS. AND OVER; VACUUM TRUCKS UNDER 7500 GALS. TRUCKS TOWING TILT BED OR FLAT BED PULL TRAILERS; LOWBED HEAVY DUTY TRANSPORT; HEAVY DUTY TRANSPORT TILLER PERSON; SELF- PROPELLED STREET SWEEPER WITH SELF-CONTAINED REFUSE BIN; BOOM TRUCK - HYDRO-LIFT OR SWEDISH TYPE EXTENSION OR RETRACTING CRANE; P.B. OR SIMILAR TYPE SELF-LOADING TRUCK; TIRE REPAIRPERSON; COMBINATION BOOTPERSON AND ROAD OILER; DRY DISTRIBUTION TRUCK (A BOOTPERSON WHEN EMPLOYED ON SUCH EQUIPMENT, SHALL RECEIVE THE RATE SPECIFIED FOR THE CLASSIFICATION OF ROAD OIL TRUCKS OR BOOTPERSON); AMMONIA NITRATE DISTRIBUTOR, DRIVER AND MIXER; SNOW GO AND/OR PLOW
FOOTNOTES: ARTICULATED DUMP TRUCK; BULK CEMENT SPREADER (WITH OR WITHOUT AUGER); DUMPCRETE TRUCK; SKID TRUCK (DEBRIS BOX); DRY PRE-BATCH CONCRETE MIX TRUCKS; DUMPSTER OR SIMILAR TYPE; SLURRY TRUCK: USE DUMP TRUCK YARDAGE RATE. HEATER PLANER; ASPHALT BURNER; SCARIFIER BURNER; INDUSTRIAL LIFT TRUCK (MECHANICAL TAILGATE); UTILITY AND CLEAN-UP TRUCK: USE APPROPRIATE RATE FOR THE POWER UNIT OR THE EQUIPMENT UTILIZED. .....$ 43.86 34.28

TRUCK DRIVERS: GROUP 4: DUMP TRUCKS, OVER 25 YDS. AND UNDER 65 YDS.; WATER PULLS - DW 10'S, 20'S, 21'S AND OTHER SIMILAR EQUIPMENT WHEN PULLING AQUA/PAK OR WATER TANK TRAILERS; HELICOPTER PILOTS (WHEN TRANSPORTING MEN AND MATERIALS); LOWBEDK HEAVY DUTY TRANSPORT UP TO INCLUDING 7 AXLES; DW10'S, 20'S, 21'S AND OTHER SIMILAR CAT TYPE, TERRA COBRA, LETOURNEAU PULLS, TOURNOROCKER, EUCLID AND SIMILAR TYPE EQUIPMENT WHEN PULLING FUEL AND/OR GREASE TANK TRAILERS OR OTHER MISCELLANEOUS

TRAILERS; VACUUM TRUCKS 7500 GALS AND OVER AND
TRUCK REPAIRMAN FOOTNOTES: ARTICULATED DUMP
TRUCK; BULK CEMENT SPREADER (WITH OR WITHOUT
AUGER); DUMPCRETE TRUCK; SKID TRUCK (DEBRIS BOX);
DRY PRE-BATCH CONCRETE MIX TRUCKS; DUMPSTER OR
SIMILAR TYPE; SLURRY TRUCK: USE DUMP TRUCK YARDAGE
RATE. HEATER PLANER; ASPHALT BURNER; SCARIFIER
BURNER; INDUSTRIAL LIFT TRUCK (MECHANICAL
TAILGATE); UTILITY AND CLEAN-UP TRUCK: USE
APPROPRIATE RATE FOR THE POWER UNIT OR THE
EQUIPMENT UTILIZED. .....$ 44.21 34.28
TRUCK DRIVERS: GROUP 5: DUMP TRUCKS, 65 YDS. AND
OVER; HOLLAND HAULER; LOW BED HEAVY DUTY TRANSPORT
OVER 7 AXLES FOOTNOTES: ARTICULATED DUMP
TRUCK; BULK CEMENT SPREADER (WITH OR WITHOUT
AUGER); DUMPCRETE TRUCK; SKID TRUCK (DEBRIS BOX);
DRY PRE-BATCH CONCRETE MIX TRUCKS; DUMPSTER OR
SIMILAR TYPE; SLURRY TRUCK: USE DUMP TRUCK YARDAGE
RATE. HEATER PLANER; ASPHALT BURNER; SCARIFIER
BURNER; INDUSTRIAL LIFT TRUCK (MECHANICAL
TAILGATE); UTILITY AND CLEAN-UP TRUCK: USE
APPROPRIATE RATE FOR THE POWER UNIT OR THE
EQUIPMENT UTILIZED. .....$ 44.56 34.28

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide
employees with 1 hour of paid sick leave for every 30 hours
they work, up to 56 hours of paid sick leave each year.
Employees must be permitted to use paid sick leave for their
own illness, injury or other health-related needs, including
preventive care; to assist a family member (or person who is
like family to the employee) who is ill, injured, or has other
health-related needs, including preventive care; or for reasons
resulting from, or to assist a family member (or person who is
like family to the employee) who is a victim of, domestic
violence, sexual assault, or stalking. Additional information
on contractor requirements and worker protections under the EO
is available at https://www.dol.gov/agencies/whd/government-contracts.

Note: Executive Order 13658 generally applies to contracts subject
to the Davis-Bacon Act that were awarded on or between January 1,
2015 and January 29, 2022, and that have not been renewed or
extended on or after January 30, 2022. Executive Order 13658 does
not apply to contracts subject only to the Davis-Bacon Related Acts
regardless of when they were awarded. If a contract is subject to
Executive Order 13658, the contractor must pay all covered workers
at least $13.65 per hour (or the applicable wage rate listed on this
wage determination, if it is higher) for all hours spent performing on
the contract from May 11, 2026, through December 31, 2026. The
applicable Executive Order minimum wage rate will be adjusted annually.
Additional information on contractor requirements and worker
protections under Executive Order 13658 is available at
www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications
and wage rates that have been found to be prevailing for the
type(s) of construction and geographic area covered by the wage
determination. The classifications are listed in alphabetical
order under rate identifiers indicating whether the particular
rate is a union rate (current union negotiated rate), a survey

rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than "SU", "UAVG", "SA", or "SC" denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The "SU" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

"SU" wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The "SA" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which

the classifications and rates under the ﷺ identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

==========

END OF GENERAL DECISION

"

QUALIFICATIONS STATEMENT

This Qualifications Statement is submitted for the Highway Sewer Crossing Retrofit project for the Work to be performed as stated herein.

DESCRIPTION OF WORK TO BE PERFORMED:

_____

_____

_____

_____

SPECIFICATION SECTION(S) FOR WORK TO BE PERFORMED:

_____

_____

_____

_____

QUALIFICATION INFORMATION INCLUDED:

☐ Contractor general information
☐ Project-specific qualifications
☐ Past project experience
☐ Additional project experience / supporting material

CONTRACTOR CERTIFICATION:
The undersigned authorized representative certifies that the information submitted with this Contractor's Qualification Statement is accurate, complete to the best of the representative's knowledge, and not misleading.

_____
Contractor

Title_____

Date_____

PART 2
CONTRACT FORMS

This page left blank intentionally.

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:
   Highway Sewer Crossing Retrofit

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:

Highway Sewer Crossing Retrofit

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:

Highway Sewer Crossing Retrofit

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:	
Witness as to Surety	By_____ 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.

WARRANTY BOND

The McKinleyville Community Services District ("Owner") and _____ ("Contractor") have entered into a contract, dated _____, 20___ ("Contract") for work on the Highway Sewer Crossing Retrofit ("Project"). The Contract is incorporated by reference into this Warranty Bond ("Bond").

1. **General.** Under this Bond, Contractor as principal and _____ _____, its surety ("Surety"), are bound to Owner as obligee in the maximum amount of 100% of the final Contract Price

2. **Warranty Period.** The Contract requires Contractor to guarantee its work and that of its Subcontractors on the Project, against defects in materials or workmanship which are discovered during the one year period commencing with recordation of the Notice of Completion (the "Warranty Period").

3. **Surety's Obligations.** If Contractor faithfully carries out and performs its guarantee under the Contract, and, on due notice from Owner, repairs and make good at its sole expense any and all defects in materials and workmanship in the Project which are discovered during the Warranty Period, or if Contractor promptly reimburses Owner for all loss and damage that Owner sustains because of Contractor's failure to makes such repairs in accordance with the Contract requirements, then Surety's obligations under this Bond will be null and void. Otherwise, Surety's obligations will remain in full force and effect.

4. **Waiver.** Surety waives the provisions of Civil Code Sections 2819 and 2845.

5. **Notice.** Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

   Attn: _____
   Address: _____
   City/State/Zip: _____
   Phone: _____
   Fax: _____
   Email: _____

6. **Law and Venue.** This Bond will be governed by California law, and any dispute pursuant to this Bond will be venued in the Superior Court in which the Project is located, and no other place. Surety will be responsible for Owner's attorneys' fees and costs in any action to enforce the provisions of this Bond.

7. **Effective Date; Execution.** This Bond is entered into and is effective on _____, 20_____. Three identical counterparts of this Bond, each of which is deemed an original for all purposes, are hereby executed and submitted.

[Signatures on following page.]

SURETY:

_____ _____
Principal Principal

By: _____
Surety

By: _____
Attorney-in-Fact

By: _____
California Resident Agent

By: _____
Non-resident Agent – Attorney-in-Fact

(Attach Acknowledgment with Notary Seal and Power of Attorney)

NOTICE OF AWARD

TO: _____
_____
_____

PROJECT: Highway Sewer Crossing Retrofit

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: _____

This page left blank intentionally.

NOTICE TO PROCEED

TO: _____
_____
_____

PROJECT: Highway Sewer Crossing Retrofit

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: _____

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PART 3
GENERAL CONDITIONS

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GENERAL CONDITIONS
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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
EPA	Environmental Protection Agency
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

A-3 Definitions

a) Acceptance - The formal written acceptance by the Owner 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 Owner 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) Bureau - United States Bureau of Reclamation.

h) 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.

i) 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 Owner.

j) 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.

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

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

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

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

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

   a. all drawings which have been prepared on behalf of the Owner and which are included in the Contract Documents and all modifying drawings issued by addenda thereto;

   b. all drawings submitted pursuant to the terms of the Contract by the Contractor with his proposal and by the Contractor to the Owner 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.

p) County - County of Humboldt, California.

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

r) 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.

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

t) District - The McKinleyville Community Services District, may also be referred to as the District, MCSD, or Owner.

u) 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.

v) 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.

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

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

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

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

aa) 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.

bb) Owner - The McKinleyville Community Services District. See District.

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

dd) 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.

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

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

gg) Project Geotechnical Engineer – As specified in the project geotechnical report.

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

ii) 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 Owner by personal delivery thereof, the Owner’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.

jj) 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 Owner and means that the Contractor or the Owner has thereby entered into a covenant with the other party to do or perform the same.

kk) 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.

ll) 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.

mm) 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.

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

oo) State - State of California.

pp) 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.

qq) 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.

rr) 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 Owner 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.

ss) 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.

tt) 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.”

uu) 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.

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

ww) 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.

xx) 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.

yy) 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 Owner.

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 Owner-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 Owner’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 Owner, 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 Owner 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 Owner 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 Owner 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 Owner. Any construction activities associated with a SOW change, prior to Owner approval, may be ineligible for reimbursement. The Contractor shall obtain approval in writing from the Owner 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 Owner'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 Owner.

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 Owner shall have the right to require the performance thereof in any of the following ways, at Owner'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 Owner 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 Owner'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 Owner 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 Owner 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 Owner do not elect to have the change in the Work performed on a time and material basis, the Engineer and Owner 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 Owner and shall become binding upon the Contractor unless the Contractor submits its protest in writing to the Owner within thirty (30) calendar days of the issuance of the Change Order. The Owner 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 Owner 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 Owner 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 Owner may require. The Owner may require authentication of all time and material tickets and invoices by persons designated by the Owner for such purpose. The failure of the Contractor to secure any required authentication shall, if the Owner 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 Owner shall not constitute an acknowledgment by the Owner that the items thereon were reasonably required for the Change in the Work.

g) No overhead and profit will be paid by the Owner 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 Owner 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 Owner, 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 Owner 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 Owner 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 Owner or its officers that such conditions are universally existent nor shall the Owner 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 Owner 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 Owner.

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 Owner, 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 Owner, which will issue a decision upon each such protest, and the Owner'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 Owner, 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 Owner 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 Owner 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 Owner; that the Owner must look solely to the Contractor for the furnishing of the Work; that the Contractor must look solely to the Owner for payment; and that the Owner 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 Owner. 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 Owner 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 Owner, 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 Owner 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 Owner. If a legal action, including arbitration and litigation, against the Owner is initiated by a Subcontractor or Supplier, the Contractor shall reimburse the Owner for the amount of legal, engineering and all other expenses incurred by the Owner in defending itself in said action.

d) The Owner 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 Owner, 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 Owner 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 Owner, 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 Owner-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 Owner 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 Owner 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 Owner 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 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 Owner from payment due the Contractor.

k) A prefinal inspection of the Work will be made by the Owner and the Engineer. This inspection shall be made as soon as practical after Contractor has notified the Owner 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 Owner, Engineer, and Contractor.

B-20 Tests

The Owner 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 Owner for tests performed by the Owner 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 Owner 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 Owner 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 Owner.

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 Owner 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 Owner, 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 Owner, shall promptly remove any part or all of its equipment and supplies from the property of the Owner. If the Contractor fails to do so, the Owner 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 Owner or its agents or shall appear to the Owner 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 Owner 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 Owner, or any of its officers or agents.

B-25 Separate Contracts

The Owner 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 Owner 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 Owner, if the Owner 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 Owner 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 Owner 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 Owner, 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 Owner 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 Owner and provide unused supplies to the location and at the time arranged, for unloading and storage. The Owner 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 Owner 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 Owner, nor shall the Contractor assign any monies due, or to become due to it hereafter, without the prior written consent of the Owner.

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

a) The Owner 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 Owner labor or other contracts, and for any other purpose in connection with the installation of facilities. In doing so, the Owner 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 Owner.

b) If, prior to completion and final acceptance of all the Work, the Owner 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 Owner 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 Owner 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 Owner 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 Owner.

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

a) The Owner 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 Owner. 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 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 Owner's Right to Audit and Preservation of Records

a) The Owner 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 Owner, 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 Owner 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 Owner'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 Owner;
(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 Owner's sole judgment.

c) If any of the conditions stated in paragraph B-33(b) are satisfied, Contractor shall provide the

Owner (or its representatives), unlimited, reasonable access during working hours to the Contractor's books and records under the conditions stated above. The Owner's audit rights shall be liberally construed in the Owner's favor.

d) The Contractor, from the effective date of final payment or termination hereunder, shall preserve and make available to the Owner for a period of three (3) years thereafter, at all reasonable times at the office of the Contractor (but without any charge to the Owner), 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) In accordance with 2 CFR Section 200.512, financial and programmatic records related to expenditure of funds on grant-supported projects shall be maintained at least 3 years following the date the grantee submits its final expenditure report on the project.The Owner will make all payments required of it under this Contract subject to audit, under circumstances stated above, which audit may be performed at the Owner'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 Owner and are part of the Owner's control systems or are requested by the Contractor, the payments made under this Contract shall not constitute a waiver or agreement by the Owner that it accepts as correct the billings, invoices or other charges on which the payments are based. If the Owner's audit produces a claim against the Contractor, the Owner 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 Owner or its representative discloses an underpayment by the Owner pursuant to the terms of the Contract Documents, the Owner 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 Owner for the amount of the overpayment. The Owner'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 Owner'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 Owner'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 Owner's rights hereunder, Contractor shall be liable to the Owner for all costs, expenses and attorney's fees which the Owner 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 Owner from said persons under this clause. Such audit may be conducted by the Owner or its authorized representative.

ARTICLE III. PROGRESS AND COMPLETION OF WORK

B-34 Progress Schedule

The Contractor shall submit to the Owner 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 Owner 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 Owner will conduct a preconstruction conference. At the conference, the Owner 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 three hundred sixty-five (365) 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 Owner 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 Owner. In the event of suspension of the entire Work by the Owner, 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 Owner.

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 Owner, 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 Owner, terminate the Contract in the same manner as if the termination had been initiated by the Owner, and the Owner 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 Owner 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 Owner 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 Owner and the Engineer, terminate the Contract and recover from the Owner 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 Owner has failed to make any payment as aforesaid, the Contractor may upon ten (10) calendar days written notice to the Owner 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 Owner 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 Owner or Engineer.

If the Contractor intends to file a claim for additional compensation for a delay caused by the Owner or Engineer at a particular time, the Contractor shall file a Notice of Claim with the Owner 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 Owner 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 Owner 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 Owner, acts of another contractor in the performance of a Contract with the Owner, 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 Owner 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 Owner for additional compensation or damages unless caused by the Owner or another contractor employed by the Owner.

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 Owner 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 Owner 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 Owner's rights under this section, if at any time before completion of the work under the Contract, it shall be determined by the Owner that reasons beyond the control of the parties hereto render it impossible or against the interests of the Owner 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 Owner 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 Owner 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 Owner may take over the Work and prosecute the same to completion by contract or any other method the Owner 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 Owner 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 Owner, 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 Owner on account of termination of the Contract and subsequent completion of the Work by the Owner by whatever method the Owner 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 Owner for the full amount of such excess expense.

c) The rights and remedies of the Owner 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 Owner; 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 Owner 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 Owner 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 Owner 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 Owner 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 Owner 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 Owner 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 Owner. 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 Owner, the Engineer, and all of the Owner'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 Owner and Engineer that any or all of the foregoing obligations have been or are being fulfilled. The Contractor warrants to the Owner 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 Owner 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 Owner 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 Owner 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 Owner 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 Owner.

    (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 Owner 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

Owner, 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 Owner 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 Owner 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 Owner and Engineer and their duly authorized

representatives harmless from loss on account thereof, except that the Owner 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 Owner 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 Owner. 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 Owner 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 Owner, 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 Owner 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 Owner 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 Owner 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 Owner'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 Owner'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 Owner 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 Owner 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 Owner all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. 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 Owner 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 Owner and hereby agrees that no default, act, or omission of the Owner 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 Owner 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 Owner 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 Owner 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 Owner 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 Owner, 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 Owner 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 Owner and the Engineer.

f) The requirements as to the types, limits, and the Owner'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 Owner may have, if the Contractor or any of the Subcontractors fails to maintain the insurance coverage as required in this Section, the Owner may obtain such insurance coverage as is not being maintained, in form and amount substantially the same as required herein, and the Owner 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 Owner. 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 Owner 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 Owner 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 Owner, 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 Owner 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 Owner 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 Owner - 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 Owner under the provisions of the said Acts, or for which compensation is claimed from the Owner, 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 Owner 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:

(iv) Coverage – coverage for commercial general liability and automobile liability insurance shall be at least as broad as the following:

(v) Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 0001)

(vi) Insurance Services Office (ISO) Business Auto Coverage (Form CA 0001), covering Symbol 1 (any auto)

(vii) Limits – the Contractor shall maintain limits no less than the following:

(viii) 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 Owner) or the general aggregate limit and products-completed operations aggregate limit shall be twice the required occurrence limit.

(ix) Automobile Liability - One million dollars ($1,000,000) for bodily injury and property damage each accident limit.

(x) Required Provisions - the general liability, auto liability and excess liability policies are to contain, or be endorsed to contain, the following provisions:

(xi) The Owner, 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 Owner 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 Owner, its directors, officers, employees, or authorized volunteers.

(xii) 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 Owner 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.

(xiii) Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the Owner, its directors, officers, employees, or authorized volunteers.

(xiv) 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.

(xv) Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the Owner.

(xvi) 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.

(xvii) 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.

(xviii) The automobile liability policy shall cover all owned, non-owned, and hired automobiles.

(xix) All of the insurance shall be provided on policy forms and through companies satisfactory to the Owner.

(xx) The comprehensive general and automobile liability insurance coverage shall also include the following:

(xxi) Provision or endorsement naming the Owner, 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 Owner and Engineer and that any other insurance maintained by the Owner and Engineer is excess and not contributing insurance with the insurance required hereunder.

(xxii) "Cross Liability" or "Severability of Interest" clause.

(xxiii) 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.

(xxiv) 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 Owner, 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 Owner. At the election of the Owner 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 Owner 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 Owner 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.

l) 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 Owner. Such insurance shall insure at least against the perils of fire and extended coverage, theft, vandalism and malicious mischief, and collapse. The Owner, 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 Owner 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 Owner.

m) The Contractor shall waive all rights of subrogation against the Owner, its directors, officers, employees, or authorized volunteers.

n) Evidences of Insurance - Prior to execution of the agreement, the Contractor shall file with the Owner 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 Owner (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 Owner 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.

o) Continuation of Coverage - The Contractor shall, upon demand of the Owner 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 Owner (if builder's risk insurance is applicable) to the Owner at least ten (10) days prior to the expiration date.

p) 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 Owner, deliver to the Owner copies such policy or policies of insurance and the receipts for payment of premiums thereon.

q) 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.

r) The Owner 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 Owner, 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 Owner 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 Owner.

b) In any and all claims against the Owner 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 Owner 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 Owner.

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 Owner, the Owner 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 Owner 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 Owner 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 Owner, 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 Owner 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 Owner 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 Owner, as will establish the Owner'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 Owner 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 Owner 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 Owner shall act in accordance with the following:

(i) Each payment request shall be reviewed by the Owner 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 Owner to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which the Owner exceeds the ten-day return requirement set forth herein.

d) The Owner 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 Owner fails to pay an undisputed progress estimate within the allotted sixty (60) calendar days, the Owner 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 Owner 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 Owner 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 Owner's payment to Contractor. Failure to make such payments in a timely fashion may result in the Owner 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 Owner 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 Owner 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 Owner to pay all obligations and expenses necessary to satisfy such lien or stop notice. The Owner may withhold such payment unless or until the Contractor, within ten (10) calendar days after demand therefor by the Owner, 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 Owner 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 Owner 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 Owner and the Contractor. The date of completion shall be the date upon which the Owner makes its formal written acceptance of the Work.

B-70 Final Payment

Within ten (10) calendar days after the date of completion, the Owner 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 Owner with a signed written release of all claims against the Owner 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 Owner for the Highway Sewer Crossing Retrofit 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 Owner hereunder and by virtue of the law, the Owner 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 Owner 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 Owner 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 Owner 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 Owner will promptly pay to the Contractor the amount so withheld. When monies are withheld to protect the Owner against claims or liens of mechanics, material men, Subcontractors, etc., the Owner may at its discretion permit the Contractor to deliver a surety bond in terms and amount satisfactory to the Owner, indemnifying the Owner against any loss or expense, and upon acceptance thereof by the Owner, the Owner shall release to the Contractor monies so withheld.

B-73 Waiver of Interest

The Owner shall have no obligation to pay and the Contractor hereby waives the right to recover interest with regard to monies which the Owner 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 Owner, 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 Owner against any lien or claim. If any lien or claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner 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

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SECTION 00 01 07

SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

Civil Engineer: GHD Inc. Luke Halonen, PE	

END OF SECTION

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SECTION 00 31 00

AVAILABLE PROJECT INFORMATION

PART 1 GENERAL SUMMARY

A. Document Includes:
   1. Geotechnical Investigation Report
   2. Encroachment Permits
   3. Underground Classification
   4. Environmental Permits

B. Available Project information has been furnished by Owner to Architect/Engineer for use in designing this Project.
   1. Each Bidder shall be fully familiar with available Project information, which has been prepared for Owner by separate consultants.
   2. Available Project information is offered solely for reference and shall not be considered part of Contract Documents. Data contained in Documents prepared by Owner's separate consultants is believed to be reliable; however, Owner and Architect/Engineer do not guarantee their accuracy or completeness.
   3. In preparing their Bids, Bidders shall consider and evaluate data contained in available Project information as well as Contract Documents prepared by Architect/Engineer.

1.2 GEOTECHNICAL INVESTIGATION REPORT

A. The Work shall be constructed in conformance with the geotechnical engineering report titled "Geotechnical Report" prepared by Crawford & Associates, Inc., dated February 20, 2026. The report has been included as part of the appendices of the project documents.

B. The report identifies properties of below-grade conditions and offers recommendations for design of foundations, prepared primarily for use of Architect/Engineer.

C. Recommendations described are not requirements of the Contract unless specifically referenced in Contract Documents.

D. The report, by its nature, cannot reveal all conditions existing on the Site. Should subsurface conditions be found to vary substantially from this report, changes in design and construction of foundations will be made, with resulting changes to Contract Price and/or Contract Time.

1.3 ENCROACHMENT PERMITS

A. Draft encroachment permits from Humboldt County and Caltrans will be provided as they become available. Contractor is responsible for reviewing draft encroachment permits, and notifying the OWNER of any observed discrepancies between the Plans and permits.

B. The Contractor shall finalize these permits before performing the work. Refer to Section 01 11 00 Summary of Work, Permits for Encroachment Permit requirements.

1.4 UNDERGROUND CLASSIFICATION

A. The Contractor shall meet all requirements of the project Underground Classifications, including but not limited to, scheduling the mandated Pre-Job Conference with the Division of Occupational Safety and Health, and posting the boring Underground Classification at each job site.

B. The Underground Classifications, prepared by Division of Occupational Safety and Health Mining and Tunneling Unit, dated February 12, 2026, for each boring have been included as part of the appendices of the project documents.

1.5 ENVIRONMENTAL PERMITS

A. The Contractor shall comply with the environmental permit conditions included as part of the appendices of the project documents as follows:
   1. Mitigation Monitoring and Reporting Program.
   2. Coastal Development Permit.

END OF SECTION

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Contract description.
2. Work covered by contract documents.
3. Location and access.
4. Work sequence and constraints.
5. Underground facilities.
6. Project meetings.
7. Contractor use of premises.
8. Owner early occupancy.

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 and material requirements.
2. The Work generally includes but is not limited to: furnishing all labor, materials, equipment, and supervision required for the installation of two steel encased sewer mains crossing the US-101 via Horizontal Auger Boring (HAB) comprised of one 18-inch PVC or HDPE sewer main within a steel casing and one 12-inch PVC or HDPE sewer main within a steel casing; new sewer manholes; 10-inch to 18-inch PVC sewer mains installed via open trench; connections to existing sewer mains and manholes; coating and rechanneling of existing manholes, paving and site restoration, and other items of work as shown on the Plans. Temporary bypass pumping will be required to maintain flows during construction. Settlement monitoring will be required for each highway crossing.
3. All Work is contained in this Contract. The limits of Work are shown in the Contract Drawings and described in these Specifications. It will be the Contractor's responsibility to coordinate their activities to resolve conflicts.
4. Perform Work of Contract under fixed cost contract with the Owner in accordance with Conditions of Contract.
5. All risk of loss, damage or diminution to the Work shall rest with Contractor until final acceptance of the Work by the Owner.

B. Contract Method:
1. The Work of this Contract is a combination unit price and lump sum Contract.
2. The Contractor shall include the requirements of the General Conditions of the Contract as a part of all of its subcontract agreements.

1.3 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, and essential communications necessary for the performance of all labor, work, or other operations required for the performance of the Contract in accordance with the Contract Documents.
2. The Contractor should carefully review all sections of the Specifications in order to completely understand the work and all constraints including schedule, environmental and material requirements.
3. 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. Permits:
   1. The Contractor shall obtain all necessary permits including paying all remaining permit fees prior to commencing work. The Contractor shall comply with the permits and all other applicable local, state, and federal laws and regulations.
   2. Required permits include, but are not limited to:
      a. Caltrans Right-of-Way Encroachment Permit
         1) The DRAFT permit has been submitted to Caltrans and will be provided to the Contractor upon receipt.
         2) Upon Contractor selection, the Contractor-required submittal items shall be appended to the DRAFT permit application and be submitted to Caltrans for FINAL approval. The Contractor-required items to complete the application include but are not limited to:
            a) Traffic Control Plan
            b) Trenchless Construction Work Plan
            c) Contractor’s Qualifications and Experience
            d) Staging and Pipe Laydown Areas
            e) Settlement Monitoring and Instrumentation Plan
            f) Shoring and Trench Safety Plan
            g) Health and Safety Plan
            h) Project Schedule
            i) Stormwater Pollution Prevention Plan
      b. Humboldt County Right-of-Way Encroachment Permit
         1) The DRAFT permit is included with these Contract Documents.
         2) Upon Contractor selection, the Contractor-required submittal items shall be appended to the DRAFT permit application and be submitted to Caltrans for FINAL approval. The Contractor-required items to complete the application are anticipated to be the same as the Caltrans permit.
      c. Construction General Permit
         1) The Contractor shall obtain a CGP in accordance with Section 01 57 26 Erosion and Sediment Control for the Stormwater Pollution Prevention Plan.

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. Contractor's duties:
   1. Except as specifically noted, provide and pay for:
      a. Labor, materials and equipment.

b. Tools, construction equipment and machinery.
c. Water, 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 Humboldt County Encroachment Permit, Caltrans Encroachment Permit, and Construction General Permit.
4. Secure and pay for, as necessary for proper execution and completion of the work, applicable permits and licenses.
5. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of the work.
6. Promptly submit written notice to Engineer of observed variance of Contract Documents from legal requirements.
7. 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, they shall be discharged immediately on the requisition of the Engineer, and such person shall not again be employed on the work.
8. The Contractor shall obtain their own disposal site for replaced materials 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 Owner harmless from any and all damages that may result from the spoiling of materials.
9. The Contractor is responsible for providing construction staking and surveying as required for the job. The Owner will provide control point information as needed for the purpose of locating the project components. The Contractor shall mark the location of all new sewer manholes and piping 48 hours in advance of construction for approval by the Engineer.

E. All equipment shall be maintained in proper working order, including proper muffling.

F. Hours of construction shall be limited to the following:
1. Monday through Friday – Between 7:00 am and 5:00 pm.
2. Saturdays and Sundays – Between 10:00 am to 5:00 pm with Owner's approval.
a. Contractor shall notify all Encroachment Permit agencies at least five (5) business days prior to any work proposed on weekends, and the proposed work on weekends shall be approved prior to commencing Work.
3. Holidays – No construction shall be allowed on holidays, except in an emergency.

1.4 LOCATION AND ACCESS

A. Project is located in McKinleyville, California with two work locations as follows and as shown on plan:
1. Middle Crossing:
a. Location: Approximate Highway 101 postmile R92.3
b. Access: Via Fischer Avenue and Hammond Trail to the south for the west side of crossing, and via Thiel Avenue for the east side of crossing.
2. South Crossing:
a. Location: Approximate Highway 101 postmile R90.9
b. Access: Via Fischer Avenue for the west side of crossing and via Salmon Avenue for the east side of crossing.

1.5 WORK SEQUENCE AND CONSTRAINTS

A. General:
   1. Overall sequence of the Work under this Contract shall be in the following order:
      a. Middle Crossing.
      b. South Crossing.
   2. 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.
   3. Changes to existing utilities or any new connection thereto must be coordinated with the Owner and utility owners 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.
   4. The Contractor will be required to coordinate their schedule with the Owner personnel, to the extent practicable, to ensure a minimum of interruption to the operation of the sewer 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 in an alternative location as field conditions permit.
   5. No utility shall be disconnected without prior written approval from the Owner. When it is necessary to disconnect a utility, the Contractor shall give at least two weeks written notice to the Owner for approval of the proposed schedule.

B. Specific Sequence and Constraints:
   1. The first order of business is submission of submittals and obtaining the permits 1.3 of this Section.
   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 Owner.
   3. Specific Sequencing Constraints for each Work location include:
      a. Contractor responsible for removal and limbing of trees if as shown on the plans.
      b. Contractor shall notify the Owner 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 of any fire and life safety concerns.
      c. 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.
      d. All new utilities must be tested by the Contractor and accepted by the Owner before they can be put into service, connections between new and existing facilities can be made, and old facilities can be abandoned.
      e. Existing Owner sewer collection system will remain in operation during the duration of the Work. It is the responsibility of the Contractor to repair any damage to the existing system that may result from construction activities.
      f. Contractor shall maintain vehicular and pedestrian access at all times throughout the project duration.

1.6 UNDERGROUND FACILITIES

A. The contractor shall notify the Owner and Underground Service Alert (USA) at least 72 hours in advance of any planned excavation (800 227-2600).

B. 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.

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

D. The Contractor shall exercise care in maintaining those pipes, valves, and hydrants 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.

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

1.7 PROJECT MEETINGS

A. Section 01 30 00 - Administrative Requirements: Preconstruction Meeting, Progress Meetings, and Pre-Installation Meetings.

1.8 CONTRACTOR USE OF PREMISES

A. Construction is limited to the public right-of-way, Owner easements, and Owner property as shown on the Contract Drawings, except where access is granted on private property.
   1. A Temporary Construction Easement signed by the private property owner permitting the Contractor to do the Work on the private property shall be provided to the Contractor prior to any Work conducted on private property.
   2. Contractor to coordinate with Owner access onto private properties including notifying private property owners a minimum of seven (7) days in advance of the performing the Work.

B. Construction and storage areas are limited to the space available at the site, within the project limits of disturbance shown on the plans.
   1. During the pre-bid conference, the Owner will detail the available space that can be used by the Contractor during the project.

C. Confine operations at site to areas permitted by:
   1. Contract Documents

D. Do not encumber site with materials or equipment beyond those required to complete the work.

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

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

G. Obtain and pay for use of additional storage or work area needed for operations.

H. Return all surface areas to their original condition upon completion of the work.

1.9 OWNER EARLY OCCUPANCY

A. It is the intent of the Owner to occupy the Work for each crossing as a unit upon its completion while Work at other crossings is still in progress.

B. Neither the Owner's progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of any part of the Work.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 15 00

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. General.
   2. Work Included Under All Bid Items.
   3. Bid Schedules

1.2 GENERAL

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

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

C. See Article 6 of the General Conditions for special provisions related to Contract Modification Procedures.

D. See Article 8 of the General Conditions for special provisions related to Schedule of Values and Progress Payments.

E. Lump Sum Bid Price

   1. Payment for the lump sum bid price will include all compensation to be received by the Contractor for furnishing all material, tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of work all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of permits and cost of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the California Division of Industrial Safety and the Occupational Safety and Health Administration of the U.S Department of Labor (OSHA).

1.3 WORK INCLUDED UNDER ALL BID ITEMS

A. Contractor shall ensure each of the following is included as part of the work under each bid item:

B. The safety of personnel, subcontractor’s personnel, and the public. Safety measures shall include, but are not limited to, shoring, confined space entry, abrasive blasting, fall protection, electrical safety and warning signs as may be necessary. Safety measures shall comply with applicable laws, regulations, permits, and the Contract Documents.

C. All bid items related to the demolition or installation of underground elements such as underground pipelines and appurtenances shall include, but not be limited to: potholing to identify utility locations and conflicts, initial and final saw cutting, excavation and disposal of trench section materials including pavements, soils, and preservation of existing items, pipe bedding and backfill, pipe, joints, and other fittings as required, tracer wire, installation above or below existing utilities, supporting exposed utilities and pipes, repair or replacement of damaged existing utilities, handling and disposal of asbestos cement pipe, trench plating, trench shoring and safety, control of grades, survey construction staking, protection of trees and roots, aggregate base, temporary and final trench paving, adjusting new and existing utility rims and covers to finish grade, testing, and all other related work as described in the Contract Documents.

D. Make available all work for inspection and/or testing by the Engineer.

E. Clearing, pruning, and removal of vegetation or site features shall be performed only where shown on the Contract Drawings and as required by applicable permits. Measurement and payment shall be included in the applicable bid items unless specifically identified otherwise.

F. Restore all surfaces to their original, existing condition as nearly as possible including landscaping, sidewalks, pavement, and curbs and gutters. All materials for restoration work shall be furnished by contractor.

G. Trees not identified for removal shall be protected.

H. Proper removal and disposal of existing abandoned utilities or other subsurface structures as required to complete construction of the work.

I. Proper restraint of existing facilities. Temporary restraints may be necessary to prevent facilities from being damaged. Damage to existing facilities that occurs due to improper restraint shall be repaired by Contractor at his own expense.

J. Miscellaneous site demolition as required for the various bid items.

K. Disposal of all excess or waste materials.

L. Cleanup and sweeping of the project access roads of tracked dirt and debris.

M. Quality control. The Contractor is responsible for providing independent third-party quality control for all on-site phases of the project.

N. Provide advance notice of road or lane closures.

O. Noise and sound control.

P. Startup, testing, and commissioning.

Q. Submittals for the project.

R. As-built drawings. No portion of the work shall be deemed complete unless reflected on the as-built drawings. Contractor shall always maintain an active set of as-built drawings on site. At the completion of work, the Contractor shall provide as-built drawings to the Owner as a record of work completed.

1.4 BID SCHEDULE

A. The bid item measurement and payment descriptions are generally the same between the Middle Crossing and South Crossing work areas, unless noted otherwise, while the extent, nature, or quantity of work may vary between locations where noted in this section, in the Specifications, and as shown on the Contract Drawings.

B. The Owner reserves the right to award one, any combination, or all of the Work Area Bid Schedules listed below:
   1. Middle Crossing Work Area
   2. South Crossing Work Area

C. Each Work Area Bid Schedule constitutes an independent and complete base scope of work, capable of being awarded and constructed on a standalone basis. If fewer than all Work Area Schedules are awarded, the Owner will select which Work Area Schedule(s) to award based on Owner priorities. The selection of awarded Work Area Schedule(s) is independent of construction sequencing and independent of bid item numbering.

D. Mobilization/Demobilization is covered in two different bid item categories as outlined below and as described in the bid item measurement and payment descriptions:
   1. Major Equipment Mobilization/Demobilization.
      a. This item only covers transportation of major equipment onto and off of the project site. This item shall be awarded if one or more Work Areas are awarded.
   2. Work Area Mobilization/Demobilization.
      a. This item covers standard Mobilization/Demobilization work items but excludes major equipment transport. This item is awarded when the corresponding Work Area is awarded.

ITEM 1 – MAJOR EQUIPMENT MOBILIZATION/DEMOBILIZATION

Item 1.01 – Major Equipment Mobilization/Demobilization
Payment 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 mobilizing major equipment to the project site as well as demobilization of the same for the construction of the project. Major equipment includes specialty HAB equipment and excavators. Minor equipment includes all other equipment needed to perform the work.

All other standard mobilization and demobilization work is covered under the Work Area Mobilization/Demobilization bid items including setting up major equipment after the equipment has been mobilized and tearing down the equipment in preparation of demobilization.

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 Major Equipment Mobilization/Demobilization will be paid.

ITEM 2 – MIDDLE CROSSING WORK AREA

Item 2.01 – Work Area 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 minor 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.

This item excludes mobilization and demobilization of major equipment which is covered under Bid Item 1.01.

When 10 percent of this Work Area contract amount is earned from the 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 Work Area 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 2.02 – Construction Staking
Measurement for this item shall be on a lump sum basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to perform construction staking as required to lay out and complete the work shown on the Contract Drawings and specified in the project documents. This includes, but is not limited to, staking for alignments, structures, manholes, and other construction features; verifying installation of improvements; and furnishing all necessary survey control, materials, and documentation. No additional payment is provided for incidental staking or re-staking due to Contractor operations.

Item 2.03 – 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 and Caltrans Encroachment Permits (draft Encroachment Permits are included as Appendices to these Specifications, final permits shall 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 and Caltrans Encroachment Permits, 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 2.04 – Erosion and Sediment Controls
Measurement for this item shall be on a lump sum basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to prepare and submit a Storm Water Pollution Prevention Plan (SWPPP); and construct and maintain water pollution control best management practices as required by the Regional Water Quality Control Board's NPDES. This Work covers all Contractor costs and effort associated with providing permits and water pollution control measures including, but not limited to, erosion and sediment control measures such as silt fences, fiber rolls, and diversion dikes. Work under this item shall be paid based on the overall percent completion of the project.

Item 2.05 – Potholing
Measurement for this item shall be on a lump sum basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to locate existing underground utilities and to locate all connection locations. Potholing shall be used to identify size, material, depth, utility type and other characteristics and features necessary to properly complete the work. Contractor shall employ other utility locating techniques for convenience and shall confirm all locations through potholing as required under this item. Under this bid item, the Contractor shall confirm via potholing the necessary size and type of fittings and couplers required for all interconnections prior to attempting to make such connections and the cost of such fittings and couplers is included under other bid items. Contractor shall provide redlines to Owner prior to proceeding with the improvements work. Items covered by this bid item include, but are not limited to, identification of potholing locations, utility marking and coordination with utility owners to schedule utility marking, potholing, surveying of utility locations identified and further data gathering and documentation, verification of required fittings and couplers, restoration of potholing locations, and repair of utilities and other features damaged during potholing.

Item 2.06 – Demolition
Measurement for this item shall be based on a lump sum basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary for the removal and disposal of vegetation, trees, manholes, and sewer mains, and other demolition work for other Bid Items. Work includes, but is not limited to, clearing and grubbing, vegetation trimming, tree removal, disposal, manhole demolition, sewer main demolition and abandonment, disposal, pavement removal, excess soils, and other miscellaneous demolition items not otherwise included in other Bid Items, as shown on the Design Drawings. Removal of trees will consist of clearing logs, branches, limbs and brush and the area to be swept clean of all tree debris after completion of work on site. Work areas shall be left in a "lawn raked clean" condition upon completion of each day. Payment shall also include full compensation for all materials, labor, equipment, and supervision necessary to obtain necessary permits and pay hauling and disposal fees as shown on the Design Drawings and as required by the Specifications.

Item 2.07 – Temporary 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 develop and submit a bypass pumping plan for Engineer approval based on Contractor proposed construction schedule and sequencing.

Item 2.08 – Dewatering
Measurement for this item shall be on a lump sum basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary for dewatering the trenches, pits, and excavations to perform the Work. Items covered by this include, but are not limited to, dewatering pumps, wells, piping and hoses, filtration devices, tanks, electrical power, dewatering disposal, and all other required items for a functional dewatering system.

Item 2.09 – Middle Sewer Crossing via HAB – 12-inch Carrier Pipe in Steel Casing
Measurement for this item shall be on a lump sum basis. Payment shall include full compensation for materials, labor, equipment, and supervision necessary for trenchless drilling the 12-inch sewer main within a steel casing under Highway US-101 via Horizontal Auger Boring via a unguided or guided system, as shown on the Contract Drawings and described in the Specifications including Section 33 05 07.22 Part 1.4 H. Items covered include, but are not limited to, excavation to protect existing drainage ditch, bracing, controls, carrier piping, casings, fittings, and connections at both ends, welding, jacking and receiving shafts, drilling pad, using temporary fill, timber mats or steel plates, removal of excess materials, sheeting, shoring and bracing, site repair, and all other related work per the Contract Documents.

Item 2.10 – Sewer Manhole 60-inch Diameter (MH5-2-1 and MH5-4-1)
Measurement for this item shall be on a per unit basis. Payment shall include full compensation for all equipment, labor, materials and incidentals required for construction of 60-inch diameter sewer manhole, including but not limited to, sawcutting, pavement removal and disposal, trenching, disposal of native soils, imported backfill, compaction, temporary paving, factory cast monolithic base, precast manhole sections, interior coating, and joint wrap system, manhole frame and cover; connections to new and existing sanitary sewers, acceptance testing, and all appurtenant work, complete and in place as shown in the drawings and as required in the specifications.

Item 2.11 – Sewer Manhole 72-inch Diameter (MH5-4-2)
Measurement and payment for this item shall be similar to Base Bid Item 2.10 but is for a 72-inch diameter sewer manhole with a drop inlet connection.

Item 2.12 – Sewer Main 10-inch PVC
Measurement for this item shall be on a linear foot basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to provide planning, execution, acceptance testing, and management of the completion of all work associated with installation of 10-inch SDR35 PVC sewer piping and associated fittings as shown on the plans and as required in the specifications. Work includes confirmation of the necessary size and type of fittings and couplers required for all interconnections and providing and installing such fittings, layout, sawcutting/demolition and removal of pavement and concrete, excavation, spoils disposal, control of grade, control of water, bedding, piping, backfill material and backfilling, compaction, compaction testing. The Contractor will be required to navigate around existing crossing utilities including, but not necessarily limited to, gas lines, water 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.

Item 2.13 – Sewer Main 12-inch PVC
Measurement and payment for this item shall be similar to Base Bid Item 2.12 but is for a 12-inch main.

Item 2.14 – Connect to Existing Sewer Main
Measurement for this item shall be on a per unit basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to connect new sewer mains to existing sewer mains with new sewer couplings. Work related to excavation, backfill, and testing of the connections on the sewer mains is covered under the Sewer Main bid items for which this Work applies.

Item 2.15 – Connect to Existing Sewer Manhole and Rechannel (MH5-2)
Measurement for this item shall be on a per unit basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to connect new sewer mains to existing sewer manholes. Work includes but is not limited to, concrete coring, connecting sewer mains to manholes, removing existing channel and rechanneling manholes, sealing new manhole connection, and manhole testing.

Item 2.16 – Existing Sewer Manhole Rehabilitation (MH5-2, MH5-3)
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. The work includes, but is not limited to, pre-rehabilitation cleaning and disposal of materials, surface repairs, surface restoration, cleanup, and manhole testing.

Item 2.17 – New Sewer Manhole Interior Coating (MH5-2-1, MH5-4-1, and MH5-4-2)
Measurement and payment for this item shall be similar to Base Bid Item 2.16 but is for new manholes.

Item 2.18 – Final Paving, Curb and Gutter Replacement on Thiel Avenue
Measurement for this item will be on a lump sum basis. Payment shall include full compensation for all materials, labor, testing, equipment, disposal, and other materials and work necessary to provide new pavement and restore pavement, concrete, and curb and gutter where disturbed as shown on the Contract Documents and as may be required to restore areas affected by construction activities. This bid item includes survey and layout, excavation, removal and disposal of unsuitable materials, importation and installation of subgrade materials, grade control, compaction and compaction testing, providing and installing concrete and asphalt, restoration of striping and other pavement markings and signage, and all other work associated with new and restored pavement and concrete. This bid item includes pavement restoration for utility trench work. This bid item also includes repair to pavement and concrete damaged during the course of construction. Work related to pavement demolition is covered under the item for which the demolition occurs.

Item 2.19 – Settlement Monitoring
Measurement for this item shall be on a lump sum basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to furnish and

install settlement monitoring points at locations shown on the Drawings and as required by the Caltrans Encroachment Permit, perform baseline readings prior to construction, conduct regular monitoring during trenchless operations and post-installation as specified in Section 31 09 13, record and report all measurements including any deviations beyond allowable tolerances, and maintain monitoring equipment and accuracy throughout the monitoring period. No additional payment for work required to maintain accuracy or repeat measurements due to Contractor error.

Item 2.20 – Replace Fence
Measurement for this item shall be on a lump sum basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to remove and replace existing fencing in kind or as shown in the Contract Drawings and as required to perform the Work. Work includes, but is not limited to, existing fence removal, in kind fence replacement, excavation, new fencing, and concrete footings.

Item 2.21 – Landscape Restoration
Measurement for this item shall be on a lump sum basis. Payment shall include full compensation for all materials, labor, equipment, and supervision necessary to restore the site to preconstruction conditions required by the Contract Drawings and Specifications, including restoring disturbed areas, providing replacement topsoil as needed, restoration of pavement and access routes, application of seed, straw, hydroseeding, or other specified revegetation methods to all disturbed vegetated areas, restoration of landscaping, fencing, and other site features to pre-construction conditions or as shown on the plans, removal and proper disposal of unsuitable soils, debris, and excess materials, and final cleanup and sweeping of the project site.

ITEM 3 – SOUTH CROSSING WORK AREA

Item 3.01 – Work Area Mobilization/Demobilization
Measurement and payment for this item shall be similar to Base Bid Item 2.01.

Item 3.02 – Construction Staking
Measurement and payment for this item shall be similar to Base Bid Item 2.02.

Item 3.03 – Traffic Control
Measurement and payment for this item shall be similar to Base Bid Item 2.03.

Item 3.04 – Erosion and Sediment Controls
Measurement and payment for this item shall be similar to Base Bid Item 2.04.

Item 3.05 – NOT USED.
Not used.

Item 3.06 – Potholing
Measurement and payment for this item shall be similar to Base Bid Item 2.05.

Item 3.07 – Demolition
Measurement and payment for this item shall be similar to Base Bid Item 2.06.

Item 3.08 – Temporary Bypass Pumping
Measurement and payment for this item shall be similar to Base Bid Item 2.07.

Item 3.09 – Dewatering
Measurement and payment for this item shall be similar to Base Bid Item 2.08.

Item 3.10 – South Sewer Crossing via HAB – 18-inch Carrier Pipe in Steel Casing
Measurement and payment for this item shall be similar to Base Bid Item 2.09 but is for an 18-inch carrier pipe.

Item 3.11 – Steel Casing Cathodic Protection
Measurement for this item shall be on a lump sum basis. Payment shall include full compensation for furnishing all labor, materials, equipment, coordination, and supervision necessary to provide a complete and functional cathodic protection system as shown on the Contract Drawings and specified in the project documents. Work includes, but is not limited to, installation of anodes including excavation as necessary; trenching and placement and connection of lead wires, connectors, and attachments; installation of test stations; vaults; excavation, backfill, retention of a Certified Cathodic Protection Specialist to oversee completed testing and verification of system operation; completion of all incidental work required to install the system; re-testing and repair if necessary; and site restoration and clean up.

Item 3.12 – Sewer Manhole 60-inch Diameter (MH3-9-1, MH3-10-1, and MH3-10-2)
Measurement and payment for this item shall be similar to Base Bid Item 2.10.

Item 3.13 – Sewer Main 15-inch PVC
Measurement and payment for this item shall be similar to Base Bid Item 2.12 but is for a 15-inch main.

Item 3.14 – Sewer Main 18-inch PVC
Measurement and payment for this item shall be similar to Base Bid Item 2.12 but is for an 18-inch main.

Item 3.15 – Connect to Existing Sewer Main
Measurement and payment for this item shall be similar to Base Bid Item 2.14.

Item 3.16 – Connect to Existing Manhole and Rechannel (MH3-9)
Measurement and payment for this item shall be similar to Base Bid Item 2.15.

Item 3.17 – Existing Sewer Manhole Rehabilitation (MH3-9)
Measurement and payment for this item shall be similar to Base Bid Item 2.16.

Item 3.18 – New Sewer Manhole Interior Coating (MH3-9-1, MH3-10-1, and MH3-10-2)
Measurement and payment for this item shall be similar to Base Bid Item 2.17.

Item 3.19 – Settlement Monitoring
Measurement and payment for this item shall be similar to Base Bid Item 2.19.

Item 3.20 – Replace Fence
Measurement and payment for this item shall be similar to Base Bid Item 2.20.

Item 3.21 – Landscape Restoration
Measurement and payment for this item shall be similar to Base Bid Item 2.21.

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination and project conditions.

B. Field engineering.

C. Preconstruction meeting.

D. Progress meetings.

E. Pre-installation meetings.

F. Cutting and patching.

G. Special procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

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

B. Verify utility requirements and characteristics of operating piping infrastructure are compatible with new piping. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, new facilities.

C. Investigate utility locations in the vicinity of the work. Contact utility providers and verify the type, size, and location of utilities. Conduct field location methods such as ground penetrating radar and potholing to locate utilities that may be in conflict with the work or that are to be connected to. Relocate utilities that conflict.

D. In finished areas conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.

E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion.

F. After Owner acceptance of work, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 FIELD ENGINEERING

A. Employ Land Surveyor registered in California as may be required for laying out the improvements.

B. Locate and protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.

C. Provide control datum for survey in the vicinity of the work.

D. Verify set-backs and easements; confirm drawing dimensions and elevations.

E. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

F. Submit copy of site drawing and certificate signed by Land Surveyor certifying elevations and locations of the Work are in conformance with Contract Documents.

G. Maintain complete and accurate log of control and survey work as Work progresses.

H. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

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

J. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.

1.4 PRECONSTRUCTION MEETING

A. Engineer will schedule meeting after Notice of Award.

B. Attendance Required: Owner, Engineer, Contractor and major subcontractors.

C. Agenda Example:
   1. Distribution of Contract Documents.
   2. Submission of list of Subcontractors, schedule of values, and progress schedule.
   3. Designation of personnel representing parties in Contract and Engineer.
   4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   5. Scheduling.
   6. Use of premises by Owner and Contractor.
   7. Owner's requirements.
   8. Construction facilities and controls provided by Owner.
   9. Temporary utilities provided by Owner (none)
   10. Testing (provided by contractor)
   11. Survey (provided by contractor).
   12. Security and housekeeping procedures.
   13. Site Safety (responsibility of contractor)

14. Application for payment procedures.
15. Procedures for testing.
16. Procedures for maintaining record documents.
17. Requirements for start-up of equipment.

D. Record minutes and distribute copies within two working days after meeting to participants, with two copies to Engineer, Owner, and those affected by decisions made.

1.5 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum of bi-monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Owner, job superintendent, major subcontractors and suppliers, Engineer as appropriate to agenda topics for each meeting.

D. Agenda Example:
1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems impeding planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

E. Record minutes and distribute copies within two working days after meeting to participants, with two copies to Engineer, Owner, and those affected by decisions made.

1.6 PRE-INSTALLATION MEETINGS

A. When required in individual specification sections or as directed by the Engineer, convene pre-installation meetings at Project site prior to commencing work of specific section or direction.

B. Require attendance of parties directly affecting, or affected by, Work of specific section.

C. Notify Engineer four working days in advance of meeting date.

D. Prepare agenda and preside at meeting:

1. Review conditions of installation, preparation and installation procedures.
2. Review coordination with related work.

E. Record minutes and distribute copies within two working days after meeting to participants, with two copies to Engineer, Owner, and those affected by decisions made.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements affecting:
1. Structural integrity of element.
2. Integrity of weather-exposed or moisture-resistant elements.
3. Efficiency, maintenance, or safety of element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or separate contractor.

C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:
1. Fit the several parts together, to integrate with other Work.
2. Uncover Work to install or correct ill-timed Work.
3. Remove and replace defective and non-conforming Work.
4. Remove samples of installed Work for testing.
5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute work by methods to avoid damage to other Work, and to provide proper surfaces to receive patching and finishing.

E. Cut masonry and concrete materials using masonry saw or core drill.

F. Restore Work with new products in accordance with requirements of Contract Documents.

G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly refinish entire unit.

I. Identify hazardous substances or conditions exposed during the Work to Engineer for decision or remedy.

END OF SECTION

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. References.

B. Quality assurance.

C. Format.

D. Schedules.

E. Submittals.

F. Review and evaluation.

G. Updating schedules.

H. Distribution.

1.2 REFERENCES

A. The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry, Washington, D.C., The Associated General Contractors of America (AGC).

1.3 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel specializing in CPM scheduling with one year minimum experience in scheduling construction work of complexity comparable to this Project and having use of computer facilities capable of delivering detailed graphic printout within 48 hours of request.

B. Contractor's Administrative Personnel: one year minimum experience in using and monitoring CPM schedules on comparable projects.

1.4 FORMAT

A. Listings: Reading from left to right, in ascending order for each activity. Identify each activity with applicable specification section number.

B. Diagram Sheet Size: 22 inches high x 34 inches wide.

C. Scale and Spacing: To allow for notations and revisions.

1.5 SCHEDULES

A. Prepare network analysis diagrams and supporting mathematical analyses using Critical Path Method, under concepts and methods outlined in AGC's "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".

B. Illustrate order and interdependence of activities and sequence of work; how start of given activity depends on completion of preceding activities, and how completion of activity may restrain start of subsequent activities.

C. Illustrate complete sequence of construction by activity, identifying work of separate stages. Indicate dates for submittals and return of submittals; dates for procurement and delivery of critical products; and dates for installation and provision for testing. Include legend for symbols and abbreviations used.

D. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
   1. Preceding and following event numbers.
   2. Activity description.
   3. Estimated duration of activity, in maximum 15 day intervals.
   4. Earliest start date.
   5. Earliest finish date.
   6. Actual start date.
   7. Actual finish date.
   8. Latest start date.
   9. Latest finish date.
   10. Total and free float; accrue float time to Owner and to Owner's benefit.
   11. Monetary value of activity, keyed to Schedule of Values.
   12. Percentage of activity completed.
   13. Responsibility.

E. Analysis Program: Capable of accepting revised completion dates, and recomputation of scheduled dates and float.

F. Required Sorts: List activities in sorts or groups:
   1. By preceding work item or event number from lowest to highest.
   2. By longest float, then in order of early start.
   3. By responsibility in order of earliest possible start date.
   4. In order of latest allowable start dates.
   5. In order of latest allowable finish dates.
   6. Contractor's periodic payment request sorted by Schedule of Values listings.
   7. Listing of basic input data generating report.
   8. Listing of activities on critical path.

G. Coordinate contents with schedule of values in Section 01 33 00 - Submittal Procedures.

1.6 SUBMITTALS

A. Within 10 days after date established in Notice to Proceed, submit proposed preliminary network diagram defining planned operations for first 60 days of Work, with general outline for remainder of Work.

B. Participate in review of preliminary and complete network diagrams jointly with Engineer.

C. Within 20 days after joint review of proposed preliminary network diagram, submit draft of proposed complete network diagram for review. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete network analysis consisting of network diagrams and mathematical analysis.

E. Submit updated network schedules with each Application for Payment.

F. Submit digitally and two hard copies.

G. Submit under transmittal letter form specified in Section 01 33 00 - Submittal Procedures.

1.7 REVIEW AND EVALUATION

A. Participate in joint review and evaluation of network diagrams and analysis with Engineer at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise network diagrams and analysis incorporating results of review, and resubmit within 10 days.

1.8 UPDATING SCHEDULES

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Annotate and/or update diagrams to graphically depict current status of Work.

C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

D. Indicate changes required to maintain Contract Date of Completion.

E. Submit sorts required to support recommended changes.

F. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect.

1.9 DISTRIBUTION

A. Following joint review, distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Engineer, CM and Owner.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 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.

L. Construction photographs.

1.2 SUBMITTAL PROCEDURES

A. Transmit each submittal with Engineer accepted form.

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 excluding delivery time to and from Contractor.

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.

1.3 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.

1.4 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. Submit number of copies Contractor requires, plus three copies Engineer will retain.

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

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

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

1.5 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 and Closeout Requirements.

1.6 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 and Closeout Requirements.

1.7 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.

1.8 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.

1.9 CERTIFICATES

A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Engineer’s, 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.

1.10 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.

1.11 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.

1.12 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.

1.13 CONSTRUCTION PHOTOGRAPHS

A. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Engineer.

B. Each month submit photographs with Application for Payment.

C. Photographs: Digital color photographs with resolution suitable for printing at 8-1/2” by 11” size.

D. Take five site photographs from differing directions and locations, and five interior photographs of structures indicating relative progress of the Work, three working days maximum prior to submitting an Application for Payment.

E. Identify each print on front. Identify name of Project, contract number, orientation of view, date and time of view.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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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. 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, test, adjust and balance 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

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SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Public Utilities
   1. Agencies Affected
   2. Notification Requirements
   3. Contractor Responsibility

B. Temporary Utilities:
   1. Temporary electricity.
   2. Temporary lighting for construction purposes.
   3. Temporary cooling.
   4. Temporary ventilation.
   5. Internet service.
   6. Temporary water service.
   7. Temporary sanitary facilities.

C. Construction Facilities:
   1. Field offices and sheds.
   2. Vehicular access.
   3. Parking.
   4. Progress cleaning and waste removal.
   5. Project identification.
   6. Traffic regulation.
   7. Fire prevention facilities.

D. Temporary Controls:
   1. Barriers.
   2. Security.
   3. Water control.
   4. Dust control.
   5. Erosion and sediment control.
   6. Noise control.
   7. Pest control.
   8. Pollution control.
   9. Rodent control.

E. Removal of utilities, facilities, and controls.

1.2 PUBLIC UTILITIES

A. Agencies Affected
   1. Electrical: Pacific Gas & Electric. It should be noted that where a structure is known to receive service does not have overhead service then underground service shall be assumed to exist.

2. Gas: Pacific Gas & Electric. It should be noted that where a structure is known to receive service does not have overhead service then underground service shall be assumed to exist
3. Telephone/Cable Service: Optimum. It should be noted that where service to a structure is known to receive service does not have overhead service then underground service shall be assumed to exist.
4. Potable Water Service: Owner has jurisdiction over potable water usage within the project area.
5. Sanitary Sewer Service: Owner has jurisdiction over potable water usage within the project area.
6. Drainage: County or Caltrans has jurisdiction over drainage within the project area.

B. Notification Requirements
   1. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway; the Contractor shall notify the respective authorities representing the owners or agencies responsible for such facilities not less than three (3) work days nor more than seven (7) work days prior to excavation.
   2. Notify USA at (800) 227-2600 at least three (3) work days, but no more than fourteen (14) work days, prior to such excavation.

C. Contractor Responsibility
   1. The Contractor shall anticipate encountering water, sewer, electrical, communication, drainage and telephone/cable services. It may be expected that there will be variation in location from that as shown on the Plans to the actual location. Contractor responsible for verifying actual location in the field after pre-marking by the various utilities affected.
   2. 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.
   3. 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 with the Contractor to endeavor to familiarize him with all known underground utilities obstructions, but this will not relieve the Contractor from full responsibility in anticipating and locating their actual location.

1.3 The Contractor, in conjunction with the affected utility company(s), shall pothole and establish the horizontal and vertical locations 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 working days in advance of the date of construction within such area. Any discrepancies (horizontal and/or vertical) between the locations of utilities found by the potholing operation than that shown on the Plans shall be brought to the Construction Manager's attention immediately. Potholing shall be required at the connection to existing facilities prior to the shop drawing submittals.

1.4 TEMPORARY ELECTRICITY

A. Provide and pay for power service required from utility source or from portable generators as needed for construction operation.

B. Provide temporary electric feeder from existing electrical service if required. Coordinate location with the Engineer. Do not disrupt Owner's use of service.

C. Complement existing power service capacity and characteristics as required for construction operations.

D. Provide power outlets, with branch wiring and distribution boxes located as required for construction operations. Provide flexible power cords as required for portable construction tools and equipment.

E. Provide main service disconnect and over-current protection at convenient location.

F. Contractor to coordinate with Owner for convenience receptacles that may be required during construction.

1.5 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain temporary lighting for construction operations as may be needed to achieve minimum lighting level of 2 watt/sq ft.

B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.

C. Provide and maintain 0.25 watt/sq ft HID lighting to interior work areas after dark for security purposes if applicable.

D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps for specified lighting levels.

E. Maintain lighting and provide routine repairs.

F. Permanent building lighting may be utilized during construction.

1.6 TEMPORARY COOLING

A. Provide and pay for cooling devices and cooling as needed to maintain specified conditions for construction operations if applicable.

B. Prior to operation of permanent equipment for temporary cooling purposes, verify installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

C. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications if applicable.

1.7 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases if applicable.

1.8 INTERNET SERVICE

A. Provide, maintain, and pay for high speed internet service to Contractor's and Engineer's field offices (if provided) at time of project mobilization. This may require wireless service be used until a land line can be brought to the site.

1.9 TEMPORARY WATER SERVICE

A. Provide and pay for suitable quality water service as needed to maintain specified conditions for construction operations including as needed for compaction, dust control, etc.

B. Furnish cool, potable water for construction personnel in locations convenient to work stations.

1.10 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of project mobilization.

1.11 FIELD OFFICES AND SHEDS

A. Office: Weather tight, with lighting, electrical outlets, cooling and ventilating equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 10 persons.

C. Separate work station, similarly equipped and furnished, for use of Engineer.

D. Locate offices and sheds minimum distance of 30 feet from existing and new structures.

E. Do not use permanent facilities, once constructed, for field offices or for storage.

F. Environmental Control:
   1. Cooling and Ventilating for Offices: Automatic equipment to maintain comfort conditions 76 degrees F cooling.

2. Storage Spaces: Ventilation as needed to maintain products in accordance with Contract Documents; lighting for maintenance and inspection of products.

G. Storage Areas And Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and for inspection of products to requirements of Section 01 60 00 - Product Requirements.

H. Preparation: Fill and grade sites for temporary structures sloped for drainage away from buildings.

I. Installation:
1. Install office spaces ready for occupancy 15 working days after date fixed in Notice to Proceed.
2. Parking: Two hard surfaced parking spaces for use by Engineer, connected to office by hard surfaced walk.
3. Employee Residential Occupancy: Not allowed on property.

J. Maintenance and Cleaning:
1. Weekly janitorial services for offices; periodic cleaning and maintenance for office and storage areas.
2. Maintain approach walks free of mud, water, and snow.

K. Removal: At completion of Work remove temporary fill, buildings, foundations, utility services, and debris. Restore areas.

1.12 VEHICULAR ACCESS

A. Construct temporary all-weather access roads from public thoroughfares to serve construction area, of width and load bearing capacity to accommodate unimpeded traffic for construction purposes, if applicable. Remove temporary access road at completion of project and restore site to pre-existing condition.

B. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage if required.

C. Extend and relocate vehicular access as Work progress requires, provide detours as necessary for unimpeded traffic flow if required.

D. Location approved by Engineer.

E. Provide unimpeded access for emergency vehicles. Maintain 20 feet wide driveways with turning space between and around combustible materials.

F. Provide means of removing mud from vehicle wheels before entering streets. Comply with any other requirements of project permits

1.13 PARKING

A. Locate as approved by Engineer.

B. When site space is not adequate, provide additional off-site parking.

C. Tracked vehicles not allowed on paved areas.

D. Do not allow heavy vehicles or construction equipment in parking areas.

E. Permanent Pavements and Parking Facilities:
   1. Prior to Substantial Completion, bases for permanent roads and parking areas may be used for construction traffic.
   2. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.

F. Maintenance:
   1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, and mud.
   2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

G. Removal, Repair:
   1. Remove temporary materials and construction at Substantial Completion.
   2. Remove underground work and compacted materials to depth of 2 feet; fill and grade site as specified.
   3. Repair facilities damaged by use, to specified condition.

1.14 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.

B. Remove debris and rubbish from work areas.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.

E. Free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids if applicable.

F. and restore area.

1.15 TRAFFIC REGULATION

A. Haul Routes:
   1. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
   2. Confine construction traffic to designated haul routes.
   3. Coordinate with GIAA on the establishment of a haul route to take excess soil to the stockpile area within the Air Operations Area.
   4. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

B. Traffic Signs and Signals:
   1. Provide signs at approaches to site and on site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
   2. Provide, operate, and maintain traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
   3. Relocate as Work progresses, to maintain effective traffic control.
   4. See typical traffic control requirements within the design set.

C. Removal:
   1. Remove equipment and devices when no longer required.
   2. Repair damage caused by installation.
   3. Remove post settings to depth of 2 feet.

1.16 FIRE PREVENTION FACILITIES

A. Prohibit smoking within buildings under construction. Designate area on site where smoking is permitted. Provide approved ashtrays in designated smoking areas.

B. Establish fire watch for cutting and welding and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.

C. Portable Fire Extinguishers: NFPA 10; 10 pound capacity, 4A-60B: C UL rating.
   1. Provide one fire extinguisher at each stair on each floor of buildings under construction if applicable.
   2. Provide minimum one fire extinguisher in every construction trailer and storage shed.
   3. Provide minimum one fire extinguisher on roof during roofing operations using heat producing equipment if applicable.
   4. Provide minimum one fire extinguisher in every piece of construction equipment or service truck.

1.17 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Keep the public and other unauthorized personnel away from trenches and other excavations. Cover excavations with plates when not managed by contractor’s personnel. Provide other types of barriers as needed to control construction areas.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Temporary fences noted on plan shall be free standing 8-foot-tall chain link fence, unless noted otherwise.

1.18 SECURITY

A. Security Program:

1. Protect Work and existing premises from theft, vandalism, and unauthorized entry.
2. Initiate program at project mobilization.
3. Maintain program throughout construction period until Owner occupancy.

B. Entry Control:
1. Restrict entrance of persons and vehicles into Project site.
2. Prepare list of authorized persons and allow entrance only to authorized persons.
3. Maintain log of visitors, make available to Owner on request.

1.19 WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.20 DUST CONTROL

A. Execute Work by methods to minimize raising dust from construction operations.

B. Provide positive means to prevent air-borne dust from dispersing into atmosphere including water and containment

1.21 EROSION AND SEDIMENT CONTROL

A. Implement approved erosion and sediment control measures as detailed in the Stormwater Pollution Prevention Plan as applicable. Follow Best Management Practices for any other situations not specifically covered by a plan.

B. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

C. Minimize surface area of bare soil exposed at one time. Provide straw mulch, coir rolls, silt fences, and other means of controlling runoff and erosion.

D. Provide temporary measures including berms, dikes, and drains, and other devices to prevent water flow.

E. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

F. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.22 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise produced by construction operations.

1.23 PEST CONTROL

A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work.

1.24 POLLUTION CONTROL

A. Implement approved pollution control measures as detailed in the Project Environmental Protection Plan if applicable.

B. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

C. Comply with pollution and environmental control requirements of authorities having jurisdiction.

D. Do not dispose of volatile wastes or oils in storm or sanitary drains or on the ground.

E. Do not allow waste materials to be washed into streams or bodies of water.

1.25 RODENT CONTROL

A. Provide methods, means, and facilities to prevent rodents from accessing or invading premises, which may include but is not limited to hiring a licensed pest control contractor certified for work on schools if a problem develops.

1.26 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

B. Remove underground installations to minimum depth of 2 feet. Grade site as indicated on Drawings.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 55 50

TEMPORARY TRAFFIC CONTROL SYSTEMS

PART 1 GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall provide all materials, equipment, and labor necessary to furnish, place, and maintain all temporary traffic control systems, including construction and maintenance area traffic control devices 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.

B. Section Includes:
   1. Review of proposed Work areas to determine temporary traffic control requirements.
   2. Verification of temporary traffic controls with the Project Engineer or the Owner prior to implementation.
   3. Maintenance of traffic control during the Work.
   4. Monitoring traffic control during the Work to determine necessary changes required to maintain adequacy.
   5. Maintenance of traffic control during non-work hours to maintain adequacy.
   6. Removal of temporary traffic control systems after completion of the Work.

1.2 REFERENCES

A. General Conditions, Section 48 – Public Convenience.

B. State of California, Department of Transportation (Caltrans) Specifications and Standards
   1. Standard Specifications
      a. Section 7 Legal Relations and Responsibility to the Public
      b. Section 12 Temporary Traffic Control
   2. Standard Plans
      a. Temporary Traffic Control Systems
   3. California Manual on Uniform Traffic Control Devices, Current Edition (California MUTCD)

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.

1.3 SUBMITTALS

A. In addition to the submittal requirements of Section 01 33 00 Submittal Procedures, the Contractor shall provide the following at least fourteen (14) calendar days prior to

excavation or horizontal directional drilling and shall meet with the approval of the Owner:

1. The Contractor shall submit for review by the Engineer, a Work Zone Traffic Control Plan on 11" x 17" format which contains only information specifically related to work zone traffic control, including pedestrian traffic control. The plan will show which California MUTCD typical applications are to be used for each work operation in addition to site specific traffic control. If the Contractor proposed to use the current edition of California MUTCD in specific work operations, they shall submit in writing for consideration which Typical Application Diagram will be used for each work operation. The Work Zone Traffic Control Plan shall be specific to the proposed method of pipeline construction (open trench or horizontal directional drill), and shall include:
    a. Specific details for construction staging, including the location and limits of the work zone.
    b. Identification of changeable message board locations. A minimum of 2 changeable message boards and 2 arrow boards shall be required.
    c. Locations of all excavations.
    d. American's with Disabilities Act (ADA) 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 for approval by the Engineer. 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 Caltrans standards and California MUTCD 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 show how they will be handled.
    l. Detail of how public transit will be handled through the construction area.
    m. Time periods of lane closures and detours.

2. 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.
3. The Work Zone Traffic Control Plan shall be prepared by a licensed California Civil or Traffic Engineer. The Work Zone Traffic Control Plan shall be submitted to the Engineer and other affected agencies for review at least two weeks prior to implementation in order to determine the Contractor's compliance with the requirements of this section.
4. No work except for installation of project identification signs will be allowed to commence prior to approval of the Work Zone Traffic Control Plan.
5. A "Letter of Responsibility," 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, Temporary Traffic Control, 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 shall commence until traffic control signing has been approved by 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. Traffic shall be maintained through the construction or maintenance zone in accordance with Sections 7-1.08, 7-1.09 and 12 of the Caltrans Standard Specifications.

D. Field changes to traffic control plans shall be approved by the Engineer prior to installation.

E. 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.

F. 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.

G. 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.

H. 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."

I. 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 Owner reserves

the right to call in a local contractor to perform the necessary work needed to improve public safety. The cost incurred shall be billed to the Contractor. 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.

J. 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.

K. 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 detours constructed as part of the Work.

L. Temporary traffic control measures shall be in effect only during Work hours. Normal traffic routing shall be reestablished at the end of each workday.

M. Contractor shall conduct his operation as to offer the least possible obstruction and inconvenience to the public, and he shall have under construction no greater amount of Work than he can prosecute properly with due respect to the rights of the public. Contractor shall provide personal advance notice to each affected resident or business informing him 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 his designated superintendent. The format and contents of the notice shall be approved by the Engineer prior to commencement of the Work.

N. Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners. Convenient access to drive-ways, 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.

O. 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.

P. 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 his 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.

Q. Under no circumstances shall access to businesses or residences be held up more than 30 minutes at any one time. The Contractor may coordinate with property and business owners to schedule work so that longer delays 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 M, hereinbefore. Before closing any street to through traffic, Contractor shall obtain prior approval from the Engineer seven (7) calendar days in advance of closure. 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 sidewalk, path or footpath.

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 the Americans with Disabilities Act (ADA) and the 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.

E. 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 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 area for duration of the project.

B. The Contractor shall provide their own temporary electrical supply for bypass pumping and dewatering, unless noted otherwise.

C. 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.

D. Contractor may propose any method that meets the requirements of these specifications. Contractor responsible for developing, implementing, maintaining, and removing a temporary bypass pumping system that meets these specifications.

1.2 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 Owner 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.

1.3 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. The Contractor shall provide their own temporary electrical supply for bypass pumping and dewatering, unless noted otherwise.
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, sewer overflows, service backups, and sewage spillage.
    a. Plan shall include procedures for preventing sewage spillage near environmentally sensitive areas including wetlands.
    b. Maintain copy of emergency plan on site for duration of project.

1.4 CONTRACTORS 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.

1.5 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 Owner deems repairable: Repair as recommended by manufacturer.
    2. When Owner deems not repairable: Replace as directed by Owner before initiating work.

PART 2 PRODUCTS

2.1 MATERIALS

A. Discharge and Suction Pipes: Approved by Owner.
    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 Owner 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 or set of pumps 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 up to the Peak Wet Weather Flow (PWWF) rates specified in the table below. Peak Dry Weather Flow (PDWF) rates provided for reference only.

Location	Section	PDWF (gpm)	PWWF (gpm)
Middle Crossing	MH7-11 to MH5-4 (from north)	133	204
	MH5-4A to MH5-4 (from south)	306	419
South Crossing	MH3-11 to MH3-10 (from east)	440	1,129

    a. Peak flows greater than the gpm specified above as approved by Owner.
    b. Commission will provide flow data for bypass system.
2. Operate 24 hours per day.

B. 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.

C. Bypass piping shall allow for thermal expansion and contraction to prevent pipe failure due to snaking or joint failures.

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 Owner’s approval of location and configuration.

3.2 INSTALLATION AND REMOVAL

A. Provisions and requirements must be reviewed by Owner before starting construction.

B. Any temporary bypass equipment that is above ground must be located in a manner that causes the least possible obstruction, impact, and inconvenience to the public. Provide traffic control plan per Section 01 55 50.

C. Remove manhole sections or make connections to existing sewer and construct temporary bypass pumping structures at access location indicated on Drawings 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.

D. When working inside manhole or force main, 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.

E. All bypass operations shall be properly secured and fenced. The Contractor shall install temporary barricade around all bypass equipment to restrict access to unauthorized persons.

F. 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.
   3. When bypass pipeline occurs in livestock areas, pipeline shall be placed in trenches, encased, or enclosed in temporary fencing. Other methods for protection may be proposed for approval.

G. During bypass pumping operation, protect sewer lines from damage inflicted by equipment.

H. 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.

END OF SECTION

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SECTION 01 57 26

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for erosion and sediment control implementation and maintenance.

1.2 REFERENCE CODES AND STANDARDS

A. The following Standards apply:
   1. Erosion and sediment control work shall conform to the California Stormwater Quality Association requirements, as outlined below:
      a. The California Stormwater Quality Association "Stormwater Best Management Practice (BMP) Construction Handbook" and the "Storm Water Pollution Prevention Plan (SWPPP) Template" and the "Construction Stormwater Sampling and Analysis Guidance" and addenda thereto issued up to, and including, the date of advertisement of the project, hereafter referred to respectively as the "Manuals." Copies of the Manuals and the Permits may be obtained from CASQA's Internet Web Site at: http://www.cabmphandbooks.com/
   2. Erosion and sediment control work shall conform to the requirements in SWRCB of the Construction General Permit Order 2022-0057-DWQ adopted on September 8, 2022.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 Submittal Procedures:

B. As part of the erosion and sediment control work, a Storm Water Pollution Prevention Plan, hereafter referred to as the "SWPPP", shall be submitted for preliminary acceptance by the Owner. The SWPPP shall conform to the provisions in the Manuals, the requirements of the Permits, and these special provisions. Upon the Owner preliminary acceptance of the SWPPP, the SWPPP shall submitted for final approval by the State Water Board and obtain the required Construction General Permit.
   1. The SWPPP shall be developed by a State of California Certified Qualified Stormwater Pollution Plan Developer (QSD). All revisions and amendments to the SWPPP shall be made by the QSD. The SWPPP shall be certified by the QSD.
   2. The SWPPP shall be implemented by a State of California Certified Qualified Stormwater Pollution Plan Practitioner (QSP) by Owner. Stormwater and non-stormwater visual inspections, sampling and analysis, and reporting activities shall be made by the QSP as required by the Construction General Permit.
   3. Contractor shall prepare the Risk Level Determination for this project. SWPPP shall meet all criteria included in the General Permit Order 2022-0057-DWQ and its Attachment D Risk Level Requirements.

4. The Contractor shall submit, for preliminary acceptance by the Owner, a SWPPP to control erosion and sediment effectively during construction of the project. Such program shall show the schedule for the erosion control work included in the contract and for all erosion and sediment control measures which the Contractor proposes to take in connection with construction of the project to minimize the effects of his operations upon the adjacent creek or other receiving waters. The Contractor shall not perform any clearing and grubbing on the project, until such program has been accepted. The Contractor shall allow time for the Owner to review the SWPPP and updates to the SWPPP. If revisions are required, as determined by the Owner, the Contractor shall submit a revised plan within the timeframe set forth by the General Conditions.
5. The Contractor shall obtain the Construction General Permit (CGP) including paying all permit fees, and shall submit the SWPPP to the State Water Board via the Stormwater Multi Application and Report Tracking System (SMARTS) for final approval.
6. The SWPPP and erosion and sediment control program shall be updated and revised whenever there is a proposed change in construction or operations which may affect the site drainage patterns or discharge of pollutants to surface waters, groundwater, or a separate municipal storm sewer system. The change will be recorded by amending (updating) the SWPPP in accordance with the provisions for SWPPP amendment.
7. The Contractor shall incorporate the "Minimum Requirements" presented in the Order No. 2022-0057-DWQ into the SWPPP. In addition to the "Minimum Requirements" presented in the Order No 2022-0057-DWQ, the Contractor shall complete the BMP Consideration Checklist presented in the Preparation Manual. The Contractor shall identify and incorporate into the SWPPP the erosion and sediment control practices selected by the Contractor or as directed by the Owner.
8. The SWPPP shall also include a detailed list of volatile and potential contaminants planned or expected to be present at the Worksite and how they will be mitigated if spilled.
9. The Owner will not be liable to the Contractor for failure to accept all or any portion of an originally submitted or revised erosion and sediment control program, nor for any delays to the work due to the Contractor’s failure to submit an acceptable erosion and sediment control program.
10. A copy of the SWPPP, together with updates, revisions and amendments shall be kept at the construction site. At the request of the Owner, the Contractor shall furnish multiple copies of the SWPPP for distribution.
11. The Contractor shall submit all required SWPPP implementation documentation such as inspection reports directly to the SMARTS for approval and submit copies to the Owner for their records.
12. The Contractor shall file the CGP Notice of Termination following confirmation of final stabilization of the site.

C. The Contractor shall develop an Erosion and Sediment Control Schedule that shall describe the timing of grading or other work activities that could affect water pollution. The Erosion and Sediment Control Schedule shall be updated by the Contractor to reflect any changes in the Contractor's operations that would affect the necessary implementation of erosion and sediment control practices.

D. Contractor shall submit working or shop drawings for any additional unit descriptions (other erosion and sediment control measures designated by the Contractor and included in the schedule of values) to the Owner for review.

E. The Erosion and Sediment Control Plans (ESC Plans) shall be included in the SWPPP Appendix and shall include site maps showing a combination of the contract drainage, stage construction, contour grading plans and erosion and sediment control components, including location of all proposed BMPs, and the location of the Contractors Staging Area including associated BMP's. Contractor shall update these site maps and the ESC Plans to accurately show the actual site conditions at various phases of construction. The ESC Plans shall graphically show the use of temporary erosion and sediment control and temporary erosion control items specified elsewhere in these technical specifications.

1.4 DESCRIPTION

A. The Contractor's program to control erosion and sediment shall be included in the SWPPP to prevent any net increase in pollution of storm water runoff from entering waterways. The Contractor shall exercise every reasonable precaution to protect the creek from pollution with fuels, oils, and other harmful materials and shall conduct the operations and schedule the operations to avoid muddying and silting of the creek. The Contractor shall provide temporary erosion and sediment control measures for all creeks or their tributaries, including but not limited to, dikes, basins, ditches, and applying straw and seed, which become necessary as a result of his operations. Contractor shall coordinate erosion and sediment control work with all other work done on the contract.

B. Erosion and sediment control maintenance work and the SWPPP shall be considered as integral functional practices to implement erosion and sediment controls. Failure to fully comply with the requirements of the permit shall subject the Contractor to all fines, damages and job delays incurred due to failure to implement the SWPPP.

C. In addition to the various erosion and sediment control measures shown on the plans and indicated herein, any further use of these measures as proposed on the SWPPP and schedule of values shall be accepted by the Owner prior to installation. If the measures being taken by the Contractor are inadequate to control erosion and sediment effectively, the Owner may direct the Contractor to revise his operations and his erosion and sediment control program. Such directions will be in writing and will specify the items of work for which the Contractor's erosion and sediment control measures are inadequate. No further work shall be performed on said items until the erosion and sediment control measures are adequate and, if also required, a revised erosion and sediment control program has been accepted.

D. Nothing in the terms of the Contract nor in the provisions of these specifications shall relieve the Contractor of the responsibility for compliance with Sections 5650 and 12015 of the Fish and Game Code, or other applicable statutes relating to prevention or abatement of water pollution.

E. All areas of exposed earth created by the Contractor beyond what is shown on the plans and referred to in the technical specifications shall also be subject to these

provisions except that the Contractor shall be fully responsible for all costs and liabilities associated with slope protection work in these areas.

F. The Contractor is solely responsible for complying with the conditions of the Construction General Permit.

1.5 EROSION AND SEDIMENT CONTROL PROGRAM

A. The SWPPP shall include the following temporary erosion and sediment control practices and their associated contract items of work as shown on the plans or specified in these special provisions:
   1. Soil Stabilization/Erosion Control
      a. Scheduling
      b. Preservation of Existing Vegetation
      c. Outlet Protection/Velocity Dissipation Devices
      d. Streambank Stabilization
      e. Hydroseeding
   2. Sediment Control
      a. Street Sweeping and Vacuuming
      b. Fiber Rolls
      c. Silt Fence
      d. Storm Drain Inlet Protection
   3. Wind Erosion Control
      a. Wind Erosion Control
   4. Tracking Control
      a. Stabilized Construction Entrance/Exit
   5. Non-Storm Water Management
      a. Water Conservation Practices
      b. Dewatering Operations
      c. Clear Water Diversion
      d. Illicit Connection/Illegal Discharge Detection and Reporting
      e. Potable Water/Irrigation
      f. Vehicle and Equipment Cleaning
      g. Vehicle and Equipment Fueling
      h. Vehicle and Equipment Maintenance
      i. Material and Equipment Use Over Water
   6. Waste Management and Materials Pollution Control
      a. Material Delivery and Storage
      b. Material Use
      c. Stockpile Management
      d. Spill Prevention and Control
      e. Solid and Liquid Waste Management
      f. Hazardous Waste Management
      g. Contaminated Soil Management
      h. Concrete Waste Management
      i. Sanitary/Septic Waste Management
   7. Contractor shall implement the following Best Management Practices (BMPs):
      a. Water all active construction areas at least twice daily.
      b. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.

c. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
d. Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
e. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
f. Seed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
g. Enclose, cover, or water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).
h. Limit traffic speeds on unpaved roads to 15 mph.
i. Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
j. Replant vegetation in disturbed areas as quickly as possible.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EROSION AND SEDIMENT CONTROL MAINTENANCE PROGRAM

A. The Contractor shall furnish sufficient personnel training, materials and adequate equipment to perform the erosion and sediment control maintenance work immediately and to work continuously until its completion. Erosion and sediment control maintenance work shall consist of maintaining temporary erosion and sediment control measures throughout the duration of the contract until permanent erosion control measures are accepted by the Owner.

3.2 EROSION AND SEDIMENT CONTROL IMPLEMENTATION

A. The Contractor shall have a year-round program for implementing, inspecting and maintaining erosion and sediment control practices for soil stabilization/erosion control, sediment control, wind erosion control, tracking control, non-storm water control, and waste management and materials pollution control.

B. Upon acceptance of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, removing and disposing of the erosion and sediment control practices included in the SWPPP and any amendments. Unless otherwise directed by the Owner, the Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered by the Owner. Requirements for installation, construction, inspection, maintenance, removal, and disposal of erosion and sediment control practices are specified in the Manuals and these special provisions.

C. The National Weather Service weather forecast shall be monitored and used by the Contractor on a daily basis. An alternative weather forecast proposed by the Contractor may be used if accepted by the Owner. If precipitation is predicted, the

necessary erosion and sediment control practices shall be deployed prior to the onset of the precipitation.

D. Contractor shall designate a Qualified SWPPP Practitioner (QSP) to inspect the site before a forecast storm, during the storm (at 24-hour intervals during extended rains), and after a storm. Inspections shall be documented as per the Manuals.

E. The QSP shall prepare Rain Event Action Plans (REAP), and shall perform stormwater discharge sampling and reporting activities per Attachment D of the Construction General Permit.

F. If the Contractor or the Owner identifies a deficiency in any aspect of the implementation of the accepted SWPPP or amendments, the deficiency shall be corrected immediately. The deficiency may be corrected at a later date and time if requested by the Contractor and accepted by the Owner in writing, but not later than 72 hours following discovery of the deficiency or the onset of precipitation. If the Contractor fails to correct the identified deficiency within the required time frame or prior to the onset of precipitation the project shall be in noncompliance. Attention is directed to the payment sections for possible noncompliance penalties.

G. If the Contractor fails to conform to the provisions of "Erosion and Sediment Control," the Owner may order the suspension of construction operations which create water pollution.

H. Implementation of erosion and sediment control practices may vary by season. The BMP Manuals and these special provisions shall be followed for control practice selection of year round erosion and sediment control practices.

I. Disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur or will occur during the ensuing 14 calendar days. Non-active areas shall be protected as prescribed in the BMP Manuals within 14 calendar days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.

J. In order to provide effective erosion control the Contractor may be directed to apply permanent erosion control in small or multiple units as disturbed soil areas are deemed substantially complete by the Owner.

K. The Contractor shall conform to the following provisions:
   1. Barriers adequate to prevent flow of muddy water, vegetation debris, soil and other materials into the creek shall be constructed and maintained between working areas and the creek, and during construction of such barriers, muddying of the creek shall not be permitted.
   2. Oily or greasy substances originating from the Contractor’s operations shall not be allowed to enter or be placed where they will later enter the creek.

3.3 RESTORATION

A. Holes, depressions, sumps or any other ground disturbance caused by the removal of the erosion and sediment control measures shall be backfilled and repaired.

B. Remove all temporary BMP's from the construction site.

C. Contractor shall implement BMPs to reduce pollutants in storm water discharges that are reasonably foreseeable after all construction phases have been completed at the site. (Post-construction BMPs).

END OF SECTION

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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 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 and 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.

1.3 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.

1.4 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.

1.5 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.

1.6 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 four copies 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 AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Starting of systems.

D. Demonstration and instructions.

E. Testing, adjusting and balancing.

F. Protecting installed construction.

G. Project record documents.

H. Operation and maintenance data.

I. Spare parts and maintenance products.

J. Product warranties and product bonds.

1.2 CLOSEOUT PROCEDURES

A. Closeout Submittals
   1. Project Record Drawings: As specified in Section 01 70 00 Execution and Closeout Requirements.
   2. Warranties and Bonds: As specified in individual sections and this Section 01 70 00 Execution and Closeout 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 deficiencies 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. After all deficiencies have been corrected a Letter of Acceptance will be issued.

D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.3 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

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.

1.4 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.

1.5 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.

1.6 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.

1.7 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.

1.8 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.

1.9 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.

1.10 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.

1.11 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

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SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

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 ways in a condition equal to that at the beginning of Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PROTECTION

A. The Contractor shall contact Underground Service Alert (USA) (800) 227-2600 in accordance with the requirements of Section 01 50 00, “Temporary Facilities and Controls.”

B. The Contractor shall be solely responsible for the protection of adjacent properties, structures, streets and utilities. Any damage shall be repaired to its original condition, 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 Contract Drawings and as directed by the Engineer. Objectionable materials shall include but are not limited to all abandoned pipes, conduits, waste concrete, undergrowth and dead wood. 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 debris, rock, and extracted plant life from site.

B. Remove paving, and concrete slabs as indicated on Contract Drawings. Neatly saw cut edges at right angle to surface.

C. Do not burn or bury materials on site. Leave site in clean condition.

3.4 TOP SOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, re-landscaped, or regarded without mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile and protect from erosion. Stockpile material on impervious material and cover over with same material until reuse.

D. Remove excess topsoil not intended for reuse from site.

3.5 DURING CONSTRUCTION

A. Execute cleaning to insure 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 his own 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
Fax: (707) 441-5699

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

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: Optimum - 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 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Formwork.
   2. Reinforcement.
   3. Accessories.
   4. Cast-in place concrete.
   5. Finishing and curing.

1.2 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal requirements.

B. Shop Drawings:
   1. Indicate pertinent dimensioning, location of construction joints, and pouring sequence.
   2. Indicate reinforcement sizes, spacing, locations, and quantities, bending and cutting schedules.

C. Product Data: Indicate admixtures, anchors, grout, and epoxy grout.

D. Design Data: Submit mix designs.

E. Testing: submit results of testing including compressive strength slump.

F. Transit mix delivery slips
   1. Keep a record at the job site showing the time and place of each pour of concrete, together with transit mix delivery slip certifying contents of the pour, time of batching, etc.

1.3 QUALITY ASSURANCE

A. Construct and erect concrete formwork in accordance with ACI 318.

B. Perform concrete reinforcing work in accordance with ACI 318.

C. Perform cast-in-place concrete work in accordance with ACI 318 .

D. Qualifications of workmen:
   1. Provide at least one (1) person who shall be present at all times during execution of this portion of the Work and who shall be thoroughly trained and experienced in placing the types of concrete specified and who shall direct all Work performed under this Section.
   2. For finishing of exposed surfaces of the concrete, use only thoroughly trained and experienced journeyman concrete finishers.

PART 2 PRODUCTS

2.1 FORM MATERIALS AND ACCESSORIES

A. Form Materials: At discretion of Contractor.

B. Form Release Agent: Colorless mineral oil not capable of staining concrete or impairing natural bonding characteristics of coating intended for use on concrete.

2.2 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for support of reinforcing; plastic tipped or non-corroding for supports in slabs forming finished ceilings or where supports are exposed to weather.

C. Fabricate concrete reinforcement in accordance with ACI 318.

2.3 CONCRETE MATERIALS

A. Cement: ASTM C150, Normal-Type I Portland type.

B. Fine and Coarse Aggregates: ASTM C33. Maximum aggregate size.

C. Water: Clean and not detrimental to concrete.

D. Air Entrainment Admixture: ASTM C260.

E. Non-shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

F. Epoxy Grout: ASTM C881, two-component high-solids epoxy based system supplied in manufacturer's standard cartridge and dispensed through a static-mixing nozzle supplied by the manufacturer. Anchors and dowels shall be installed per manufacturer’s instructions.

G. Pozzolan: If used for cement replacement, shall conform to ASTEM C618 Class N or Class F (fly ash) with the following exceptions:
   1. Pozzolanic activity index with lime, at 7 days, shall be 1000 psi minimum (Table 2, ASTM C618).

H. All other materials not specifically described but required for a complete and proper installation or cast-in-place concrete, shall be as selected by the Contractor subject to the approval of the Engineer.

2.4 COMPOUNDS, HARDENERS AND SEALERS

A. Curing Compound: ASTM C309, Type 1, Class A.

B. Membrane Curing Compound: ASTM C1315 Type I, Class C.

C. Absorptive Mats Type C: ASTM C171.

2.5 CONCRETE MIX

A. Mix and deliver concrete in accordance with ASTM C94/C94M, Option A.

B. Furnish concrete of the following strength:
   1. Compressive strength 3000 psi (28 day).
   2. Slump four (4) to six (6) inches.

C. Select admixture proportions for normal weight concrete in accordance with ACI 318.

D. Add air entraining agent to concrete mix for concrete work exposed to exterior.

E. All concrete shall contain 5%±1 entrained air.

PART 3 EXECUTION

3.1 FORMWORK ERECTION

A. Erect formwork, shoring and bracing to achieve design requirements.

B. Provide bracing to ensure stability of formwork.

C. Form external corners of all concrete with 1/2 inch chamfer.

D. Apply form release agent to formwork prior to placing form accessories and reinforcement.

E. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings affected by agent.

F. Clean forms as erection proceeds, to remove foreign matter.

3.2 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS

A. Provide formed openings where required for work to be embedded in and passing through concrete members.

B. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

C. Install concrete accessories straight, level, and plumb.

3.3 REINFORCEMENT PLACEMENT

A. Place reinforcement, supported and secured against displacement.

B. Ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings.

C. Space reinforcement bars with minimum clear spacing in accordance with ACI 318.

D. Maintain concrete cover around reinforcement in accordance with ACI 318.

3.4 PLACING CONCRETE

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.

B. Remove all wood scraps, debris, and standing water from the areas in which concrete will be placed. Use cleanout openings in wall forms and otherwise where access for removal of debris is not practicable.

C. Place concrete continuously between predetermined expansion, control and construction joints. Do not break or interrupt successive pours creating cold joints unless approved by the Engineer during the submittal process.

D. Concrete shall be placed and consolidated by methods that will not cause segregation of the aggregates and will result in dense, homogeneous concrete which is free of voids and rock pockets. All concrete shall be placed while fresh and before it has taken an initial set.

E. Forms and subgrade shall be thoroughly moistened with water immediately before placing concrete.

F. Concrete shall be consolidated by means of high frequency internal vibrations within 15 minutes after it is deposited in the forms. The vibrators shall not be attached to or held against the forms or reinforcing steel. The vibration shall be done with care and in such a manner that displacement of reinforcement is avoided.

G. Where new concrete is doweled to existing work, drill holes in existing concrete and secure dowels with epoxy grout per manufacturer’s instructions.

H. Screed slabs-on-grade level, unless it is sloped to a drain.

3.5 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Remove formwork progressively and in accordance with code requirements.

3.6 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
   1. Protect concrete footings from freezing for minimum 5 days.

B. Place absorptive matting, moisten, and keep damp.

C. Immediately after placement, protect concrete from premature drying.

D. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete for not less than 7 days.

E. At formed surfaced wet forms at least twice daily or sufficient to minimize moisture loss until forms are removed or until 7 days have elapsed from time of pour. If forms are removed before 7 days, cure concrete for remaining days similar to exposed surfaces.

3.7 FORMED SURFACES

A. Provide all formed surfaces with smooth rubbed finish.

3.8 ERECTION TOLERANCES

A. Install reinforcement within tolerances required by ACI 318.

3.9 FIELD QUALITY CONTROL

A. Contractor to hire an independent materials tester to perform field inspection and testing in accordance with ACI 318.

B. Reinforcement Inspection:
   1. Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.

C. Strength Test Samples:
   1. Sample concrete and make one set of three cylinders for every 150 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area for slabs and walls.

D. Field Testing:
   1. Measure slump and temperature for each compressive strength concrete sample.
   2. Measure air content in air entrained concrete for each compressive strength concrete sample.

E. Cylinder Compressive Strength Testing:
   1. Test Method: ASTM C39/C39M.
   2. Test Acceptance: In accordance with ACI 318.
   3. Test two cylinders at 28 days.
   4. Retain one cylinder for 56 days for testing when requested by the Engineer.
   5. Dispose remaining cylinders when testing is not required.

F. Contractor to submit all test results to Engineer for final approval.

G. Notification: Notify the Engineer at least 60 hours prior to placing concrete.

3.10 DEFECTIVE CONCRETE

A. Modify or replace concrete not conforming to required lines, details and elevations, as directed by the Engineer.

END OF SECTION

SECTION 03 60 00

GROUT

PART 1 GENERAL

1.1 SUMMARY OF SECTION

A. The principal items specified herein are:
   1. Non-Shrink Grout: Non-Shrink grout is to be used unless another type is specifically referenced or shown on the Drawings.
   2. Epoxy Grout
   3. Cement Grout

B. The Contractor shall provide all materials, equipment, and labor necessary to furnish and place grout and shall form, mix, place, cure, repair, finish, and do all other work as necessary to produce finished grout as shown on the Drawings and as specified herein.

1.2 PRICE AND PAYMENT

A. Price and payment for all grout work shall be included under the Bid Item to which it relates.

1.3 RELATED SECTIONS

A. Related work specified in other sections:
   1. Section 03 30 00 Cast-In-Place Concrete
   2. Section 03 48 00 Precast Concrete Utility Boxes

1.4 REFERENCED CODES AND SPECIFICATIONS

A. The following standards apply:
   1. Specifications, codes, and standards shall be as specified in Section 03 30 00, Cast-in-Place Concrete, and as referred to herein.
   2. Commercial Standards:
      a. ASTM C 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-In. or 50-mm Cube Specimens).
      b. ASTM C 531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacings.
      c. ASTM C 579 Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacings.
      d. ASTM C 827 Test Method for Change in Height of Early Ages of Cylindrical Specimens from Cementitious Mixtures.
      e. ASTM D 696 Test Method for Coefficient of Linear Thermal Expansion of Plastics.
      f. CRD-C 621 Army Corps of Engineers Specification for Non-shrink Grout.

1.5 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 – “Submittal Procedures”:
   1. Certificates of Compliance: Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.

PART 2 PRODUCTS

2.1 PREPACKAGED GROUTS

A. Non-Shrink Grout:
   1. Non-shrink grout shall be a prepackaged, inorganic, non-gas-liberating, non-metallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout specified herein shall be that recommended by the manufacturer for the particular application.
   2. Non-shrink grouts shall have a minimum 28-day compressive strength of 7000 psi; shall have no shrinkage (zero percent) and a maximum 4.0 percent expansion in the plastic state when tested in accordance with ASTM C 827; and shall have no shrinkage (zero percent) and a maximum of 0.2-percent expansion in the hardened state when tested in accordance with CRD C 621.
   3. Application: Non-shrink grout shall be used for the repair of all holes and defects in concrete members, grouting under all equipment base plates, and at all locations where non-shrink grout is specified.

B. Epoxy Grout:
   1. Epoxy grout shall be a pourable, non-shrink, 100-percent solids system. The epoxy grout system shall have 3 components: resin, hardener, and specially blended aggregate, all premeasured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged.
   2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.
   3. The mixed epoxy grout system shall have a minimum working life of 45 minutes at 75 degrees F.
   4. The epoxy grout shall develop a compressive strength of 5000 psi in 24 hours and 10,000 psi in 7 days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (zero percent) and a maximum 4.0 percent expansion when tested in accordance with ASTM C 827.

2.2 CEMENT GROUT

A. Cement Grout: Cement grout shall be composed of one part cement, 3 parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white portland cement shall

be blended with regular cement as needed. The minimum compressive strength at 28 days shall be 4000 psi.

B. Cement shall be as specified in Section 03 30 00, Cast-in-Place Concrete.

2.3 CONSISTENCY

A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is such that the grout is plastic and moldable but will not flow. Where "dry pack" is specified, it shall mean a grout of that consistency; the type of grout to be used shall be as specified herein for the particular application.

2.4 MEASUREMENT OF INGREDIENTS

A. Measurements for cement grout shall be made accurately by volume using appropriate containers. Shovel measurement will not be allowed.

B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

PART 3 EXECUTION

3.1 GENERAL

A. All surface preparation, curing, and protection of cement grout shall be as specified in Section 03 30 00, Cast-in-Place Concrete. The finish of the grout surface shall match that of the adjacent concrete.

B. The manufacturer of non-shrink grout and epoxy grout shall provide on-site technical assistance upon request.

C. All mixing, surface preparation, handling, placing, consolidation and other means of execution for prepackaged grouts shall be done according to the printed instructions and recommendations of the manufacturer.

3.2 CONSOLIDATION

A. Grout shall be placed in such a manner, for the consistency necessary for each application, so as to assure that the space to be grouted is completely filled.

PART 4 TESTING

4.1 GENERAL

A. Contractor's independent testing laboratory shall perform strength testing of grout in accordance with ASTM C39 and C301. Submit test reports to the Owner.

END OF SECTION

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SECTION 13 11 10

GALVANIC CATHODIC PROTECTION OF STEEL CASINGS

PART 1 GENERAL

1.1 SUMMARY

A. Scope of Work
   1. The Contractor shall furnish all materials, install all equipment and provide all labor necessary to complete the work shown on the drawings and or/listed below and all other work and miscellaneous items not specifically mentioned but reasonably inferred, including all accessories and appurtenances required for a complete system. The intent of this specification is to provide for a complete, functional cathodic protection system for the designated steel casing(s).

B. Work Includes
   1. Work included in this section consists of the components of the cathodic protection system, including magnesium anodes, cables, insulating joints, test stations and any other work necessary to complete the installation. A partial list of work included is as follows:
      a. Cathodic protection of designated steel casing(s) associated with the Highway Sewer Crossing Retrofit Project.
      b. Trenching, drilling, and other excavation.
      c. Installation of magnesium anodes, cables and test stations.
      d. Backfill and compaction of backfill.
      e. Electrical isolation of the casings from the carrier pipeline and from foreign pipelines and above grade structures utilizing insulating joints.
      f. Provide material submittals, shop drawings, reports, permits, and obtain Owner’s Representative approval where required.
      g. Correction of all deficiencies.
      h. Cleanup and restoration of surface.
   2. The work shall include the provision of all materials, equipment, and apparatus not specifically mentioned herein or noted on the plans, but which are obviously necessary to complete the work specified.

1.2 REFERENCES

A. This section contains references to the following documents. They are a part of this section as specified and modified. In case of a conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.
   1. American Society of Testing and Materials (ASTM)
   2. National Electrical Manufacturers Association (NEMA)
   3. Industrial Cable Engineers Association (ICEA)
   4. American Water Works Association (AWWA)
   5. NACE International, the Corrosion Society (NACE)
   6. American National Standards Institute (ANSI)

1.3 CODE REQUIREMENTS

A. All materials, workmanship, and installation shall conform to all requirements of the legally constituted authority having jurisdiction. These authorities include, but are not limited to, the latest revision of the State of California, Department of Industrial Relations, Division of Industrial Safety Orders of the Industrial Accident Commission, and all other applicable State, County, or City codes and regulations. Nothing in the drawings or specifications is to be construed to permit work not conforming to these regulations and codes. Where larger size or better grade materials than required by these regulations and codes are specified, the specifications and drawings shall have precedence.

1.4 SUBMITTALS

A. Prior to commencing work, the Contractor shall submit for approval by the Owner's Representative copies of the following items in accordance with submittal procedures:
   1. A complete list of cathodic protection equipment and material, including name and manufacturer, catalog number, size, finish and any other pertinent data necessary for proper identification and to determine conformance with specifications.

1.5 QUALITY ASSURANCE

A. General
   1. All work shall be performed to the satisfaction of the Owner's Representative.

B. Materials
   1. The Contractor shall not substitute for the specified materials unless approved by the Owner's Representative.

C. Testing
   1. Proper operation of anodes, test leads, and all other cathodic protection components shall be tested by the Contractor and approved by the Owner's Representative, in order to ensure proper installation and operation. The Contractor shall be responsible for correction of all deficiencies identified by the testing and all costs incurred for retesting prior to final acceptance.

D. Compaction
   1. Compaction of backfill for anodes and trenches shall match the existing conditions and shall be approved by the Owner's Representative.

1.6 INTERFERENCE AND EXACT LOCATIONS

A. The Contractor shall coordinate and properly relate this work to the site and to the work of all trades. The locations of the cathodic protection appurtenances shown on the drawings are approximate only. However, the Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, verify existing conditions in the field, determine the exact locations of existing pipelines and structures and advise the Owner's Representative of any discrepancy that may prevent or hinder the specified work from being completed. The Contractor shall be solely responsible for location and marking underground structures so as to avoid damage during construction.

PART 2 PRODUCTS

2.1 GENERAL

A. All materials shall conform to the requirements set forth herein or as designated on the drawings, unless otherwise specified. All materials must be new, free from defects, and shall be of the best commercial quality for the purpose specified. The Contractor shall furnish all necessary items and accessories not shown on the drawings or specified herein, but which are required to fully carry out the specified intent of the work, without additional cost to the Owner.

2.2 MAGNESIUM ANODES

A. Magnesium anodes shall be Alloy H-1 Magnesium. The bare magnesium ingot shall weigh 60-pounds and shall measure 4.5-inches by 4.5-inches by 60.5-inches long. The packaged anode shall weigh 126 pounds and shall be 7-inches in diameter and 64-inches long.
   1. Each anode shall conform to the following chemical composition:

Chemical Composition	
Aluminum	5.0-7.0%
Manganese	0.15%
Iron	0.003% Max.
Nickel	0.003% Max.
Copper	0.1% Max.
Zinc	2.0-4.0%
Silicon	0.30% Max
Total Other Impurities	0.3 % Max
Magnesium	Balance

B. Each anode shall be furnished with a lead wire attached to one end of the steel core, and the wire shall be of sufficient length to attach to the test station as shown on the drawings. The wire shall be connected to the steel core by silver soldering, and the connection shall be mechanically secured before soldering. The entire connection shall be insulated with an electrical potting compound. The cable attached to the anode shall be minimum No. 10 AWG, Type THHN stranded copper.

C. The anode shall be prepackaged in a permeable cloth bag filled with a mixture of 75% ground hydrated gypsum, 20% powdered bentonite, and 5% anhydrous sodium sulfate. Backfill shall have a grain size so that 100% is capable of passing through a 100-mesh screen. The mixture shall be firmly packed around the anode within the cloth bag by means of adequate vibration so that the magnesium ingot is completely surrounded with a minimum 1 inch of backfill material.

2.3 CABLES

A. Test cables shall be Type THHN, stranded copper, sized as shown on the drawings and shall conform to Federal Specification J-C-30. All cables for anodes shall be minimum No. 10 AWG Type THHN, stranded copper and shall conform to Federal Specification J-C-30. All test cables shall be minimum No. 8 AWG Type THHN,

stranded copper and shall conform to Federal Specification J-C-30. Install in minimum 1 inch PVC conduit as indicated on drawings.

2.4 EXOTHERMIC WELDS

A. All cable connections to the steel casing shall be accomplished utilizing an exothermic welding process such as "Cadweld" by Erico Products, Inc., "Thermoweld" by Continental Industries, Inc., or approved equal. Each cable shall be fitted with a copper sleeve for accomplishing the weld and cartridge, sleeves and molds for each weld shall be furnished by the same manufacturer. All materials for welding shall be sized and in accordance with recommendations in manufacturers' literature.

2.5 CABLE-TO-CASING-COATING MATERIAL

A. Epoxy used for sealing the cable-to-casing connection shall be Durcon-164, manufactured by the Duriron Company; Scotchcast Resin No. 4, manufactured by 3-M Company; or CC-1 Potting Compound, manufactured by PSI Products. Weld caps may be used in lieu of epoxy coating shall be Royston Handy Cap, as manufactured by Royston Laboratories, Inc. Thermit Weld Cap, as manufactured by Phillips Petroleum Co., or approved equivalent.

2.6 TEST STATIONS

A. Ground level test stations shall be Christy G5 traffic box with 1.5-inch-high iron grade ring per unit and a cast iron lid as shown on the drawing. Anode Test Stations shall be labeled “MCSD-ATS.”

2.7 TERMINAL BOARDS

A. Terminal boards shall be made of 1/4-inch thick phenolic plastic sized to accommodate the number of connections shown on the Drawings. Connection hardware shall be brass or bronze. All connections shall be double nutted bolts with lock washers. Copper bus bar shall be 1/8-inch thick and sized to fit.

2.8 CABLE WARNING TAPE

A. All buried test station and anode cables shall have plastic warning tape installed at a minimum of 12 inch above the top of the cables for the entire buried length of the cables. The warning tape shall be 4 inch wide and shall be yellow with black lettering with the legend "CAUTION, CATHODIC PROTECTION CABLES BURIED BELOW" in 3 inch high lettering printed at a minimum of seven-foot intervals along the entire buried length of the cable.

2.9 CABLE IDENTIFICATION TAGS

A. All cables in the terminal boxes shall be identified. The identification tags shall be white plastic "zip-tie" type straps with a plastic tab of sufficient size to allow the casing station to be written on the tab with a permanent felt tip marker, or permanent wrap-around labels.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. Galvanic cathodic protection shall be installed on all buried metallic casings where indicated on the Drawings.

B. Test stations shall be installed at all locations designated on the plans.

C. All materials, workmanship and installation shall conform with all requirements of the legally constituted authority having jurisdiction. These authorities include, but are not limited to, the latest revision of the State of California, Department of Industrial Relations, Division of Industrial Safety, Electrical Orders; The National Electric Code, General Construction Safety Orders of the Industrial Accident Commission; and all other applicable State, County, or City codes and regulations. Nothing in the drawings or specifications is to be construed to permit work not conforming to these regulations and codes. Where larger size or better grade materials than required by these regulations and codes are specified, the specifications and drawings shall have precedence.

3.2 STORAGE OF MATERIALS

A. All materials and equipment to be used in construction shall be stored in such a manner to be protected from detrimental effects from the elements. If warehouse storage cannot be provided, materials and equipment shall be stacked well above ground level and protected from the elements with plastic sheeting or other methods as appropriate.

3.3 MAGNESIUM ANODES

A. Anodes shall be installed vertically as shown in the drawings after excavation to proper depth, equal to the bottom of the casing, a minimum of 5 feet from the casing. Spacing between anodes shall be 10 feet (minimum) if multiple anodes are installed at a single test station location as shown on the drawings. Prior to placing anodes in the hole, paper or plastic bags shall be removed, but the cloth bag shall remain around the anode. Care shall be exercised during installation to prevent damage to the cloth bag and loss of backfill material. After placing each anode in the anode hole, the anode shall be saturated with 10 gallons (minimum) of potable water. After placing each anode in the anode hole, native soil, free of rocks and other foreign objects shall be placed around the anode to a minimum cover of one foot above the anode. Remainder of the trench shall then be backfilled with native soil. During installation, anodes shall not be supported or handled by use of attached wires.

B. The number of anodes to be installed at each test station is designated on the drawings.

3.4 CABLES

A. Cables buried in the ground shall be direct buried and shall be laid straight, without kinks. The cable shall have a minimum cover of 30 inch. Each cable run shall be continuous in length and free of joints or splices. Care shall be exercised during installation to avoid punctures, cuts, and similar damage to insulation. Any damage to

insulation will require replacement of the entire cable length. Backfill surrounding the cables shall be native soil free of foreign materials. Cable warning tape shall be installed 12-inches above the entire buried length of the cable.

3.5 CABLE-TO-CASING CONNECTIONS

A. Cable-to-casing connections shall be installed in the manner and at the locations shown on the drawings. The casing surface shall be cleaned to bright metal by grinding or filing prior to welding the conductor. Grinding with resin impregnated wheels shall not be allowed. The conductor shall be welded to the casing by the exothermic process with a copper sleeve fitted over the conductor, and only sufficient insulation shall be removed from the conductor to allow placing in welding mold. After the weld has cooled, all slag shall be removed, and the weld shall be tested with a sharp blow from a 22-ounce hammer to assure proper metallurgical bond. All defective welds shall be removed and replaced. All exposed surfaces of copper and steel shall be covered with a minimum thickness of 1/4 inch of insulating materials as shown on the drawings.

3.6 TEST STATIONS

A. Test stations shall be installed at locations designated on the drawings and at all anode installation locations. Exact locations of test stations shall be determined by the Owner’s Representative in the field. The terminal end of each cable shall be identified with the structure identification using the permanent cable identification tags.

3.7 ENERGIZING AND TESTING

A. After the contractor has completed the installation of the cathodic protection system, the system will be tested and adjusted by a registered Corrosion Engineer or a NACE Cathodic Protection Specialist retained by the Contractor. Prior to connection of any anodes, native potential data for the casing shall be recorded at each installed casing lead. Additional test data collected shall include the open circuit potential of each anode, the DC current output of each test station as measured using the installed calibrated shunt, “On” and “Instant Off” potentials at each test lead measured vs. a calibrated portable copper copper-sulfate reference electrode. Test data shall be reviewed by the Owner’s Representative to assess conformance with AMPP (NACE) SP0-169 and SP0-286 and the contract documents. Any and all deficiencies shall be corrected by the Contractor at their cost and retested prior to final acceptance. All retesting shall be at the Contractor's expense. The testing shall be conducted in accordance with AMPP (NACE) TM0-497.

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 17 - Trenching.
   2. Section 31 23 23 - Fill.
   3. Section 32 92 19 - Seeding.

1.2 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).

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Submit test data for controlled fill and select fill.

1.4 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 well graded river run 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: Testing and Inspection Services for Testing and analysis of soil material.

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 in sufficient quantities to meet Project schedule and requirements.

B. Separate differing materials with dividers or stockpile apart to prevent mixing.

C. 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.

B. Remove all debris from the site and leave the site in a neat and orderly condition.

C. The Contractor shall handle and dispose of unsuitable and excess material legally, at refuse facility outside the Project site.

D. All salvaged material remains the property of the Owner and shall be stockpiled by the Contractor where directed by the Engineer.

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 17 - Trenching.
   3. Section 31 23 23 - Fill.
   4. Section 32 11 23 - Aggregate Base Courses.

1.2 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.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Submit name of imported fill material suppliers and Test Data.

1.4 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 per Caltrans Standard Specifications 26-1.02B.

B. Coarse Aggregate Subbase: Crushed Gravel: Angular crushed; free of shale, clay, friable material and debris; Los Angeles abrasion 50% max; Durability index, AASHTO T210 of 35 minimum; Liquid limit 25% max; graded within the following limits:

Sieve Size	Percent Passing
2 ½ inches	100 (1)
2 inches	97-100 (1)
1 inch	65-79 (6)
1/2 inch	45-59 (7)
No. 4	28-42 (6)
No. 40	9-17 (4)
No. 200	4-8 (3)

( ) The value in the parentheses is the allowable deviation (±) from the target values.

C. Coarse Aggregate Base: Crushed Gravel: Angular crushed; free of shale, clay, friable material and debris; Los Angeles abrasion 50% max; Durability index, AASHTO T210 of 35 minimum; Liquid limit 25% max; graded within the following limits:

Sieve Size	Percent Passing
2 inches	100 (1)
1 inch	80-100 (6)
3/4 inch	64-94 (6)
3/8 inch	40-69 (6)
No. 4	31-54 (6)
No. 200	4-7 (3)

( ) The value in the parentheses is the allowable deviation (±) from the target values.

D. Aggregate Drain Rock: Natural stone; washed, free of clay, shale, organic matter; to the following limits:
   1. Minimum Size: 1/4 inch.
   2. Maximum Size: 1 1/2 inch.

E. Spawning Gravel
   1. Use Aggregate Drain Rock material described in this Section.

2. Imported gravel from outside the project watershed will not be from a source known to contain historical hydraulic gold mine tailings, dredger tailings, or mercury mine waste or tailings, unless the gravel is tested for mercury and other toxins.

F. Pea Gravel in Sandbags
   1. Natural stone; rounded; washed, free of clay, shale, organic matter; to the following limits:
      a. Minimum Size: 1/4”
      b. Maximum Size: 1/2”
   2. Provide woven sandbag material made of polypropylene, polyethylene, or polyamide material. Sandbag material shall have a minimum unit weight of four (4) ounces per square yard, minimum grab strength of 100 psi in any principal direction (ASTM D4632), Mullen burst strength exceeding 300 psi (ASTM D3786), and ultraviolet stability exceeding 70 percent.

G. River Run Rock
   1. Natural stone; rounded; washed, free of clay, shale, organic matter; to the following limits:
      a. Minimum Size: 3”
      b. Maximum Size: 6”

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: Testing and inspection services.

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

SECTION 31 09 13

GEOTECHNICAL INSTRUMENTATION AND MONITORING

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

A. Refer to Section 01 15 00 Measurement and Payment.

1.2 REQUIREMENTS

A. This section specifies the requirements for installing geotechnical instrumentation, consisting of utility monitoring points, settlement monitoring points, survey control points, and tell-tale crack monitors to monitor ground and structural movements during shaft excavation as specified in Section 33 05 07.21 Shaft Construction and during tunnel construction as specified in Section 33 05 07.22 Horizontal Auger Boring.

B. The Work includes furnishing, maintaining, monitoring, reading, recording, and removing all instrumentation associated with the Work, specified herein, and shown on the Approved Plans.

C. The instrumentation is supplemented using high-quality pre-construction condition photographs and similar post-construction condition photographs as part of a Building and Structures Assessment Plan as specified herein.

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with the following industry standards effective at time of bid:
   1. ASTM C150 – Type II Portland cement
   2. ASTM C778 – Standard Specification for Standard Sand
   3. NSF/ANSI Standard 060, Drinking Water Treatment Chemicals – Health Effects
   4. Standard Specifications for Public Works Construction (SSPWC), Section 201-1 Concrete, Mortar, and Related Materials.

B. State Regulatory Codes: current at all times:
   1. California Code of Regulations (CCR), Title 8, Tunnel Safety Orders
   2. CCR, Title 8, Construction Safety Orders, Section 1509 “Injury and Illness Prevention Program
   3. Caltrans (CT) Manual for Encroachment Permits on California State Highways
   4. CT Trenching and Shoring Manual

1.4 DEFINITIONS:

A. See Section 33 05 07.22 Horizontal Auger Boring.

B. BUILDING AND STRUCTURES ASSESSMENT PLAN: Systematic multimedia documentation that includes pictures, measurements, and descriptions for the current

condition of buildings and/or other improvements and allows for the reconstruction of improvements were they to be damaged.

C. INCLINOMETER (INC): Used for monitoring magnitude and depth of horizontal deformation of ground surface to below bottom of excavation or for measuring the tilt of a casing pre-installed inside a borehole or attached on near-vertical structural elements of temporary shoring.

D. MULTI-POINT BOREHOLE EXTENSOMETER (MPBX): Used for monitoring vertical deformations at various depths within an installed borehole.

E. RESPONSE VALUE: Predetermined value at which when attained Contractor stops the Work and provides written notice and written plan discussing operational changes that are being made so as to not attain the Shutdown Value. Operational changes shall include proposed modifications to means and methods, sequencing, equipment operation parameters, and monitoring frequency to prevent reaching the Shutdown Value.

F. SETTLEMENT MONITORING POINTS (SMPS): Vertical displacement monitoring points constructed into the ground to monitor the vertical changes in elevation over the Project duration.

G. SHUTDOWN VALUE: Predetermined level at which when attained Contractor stops Work until submittal and Owner's acceptance of a written plan detailing corrective actions and restoration.

H. SURVEY CONTROL POINT: Temporary location established outside the zone of influence of any construction activities and used as a fixed reference or control point to monitor by optical survey methods the occurrence and amount of vertical and horizontal displacements at instrument locations.

I. TELL-TALE CRACK MONITORS: Instruments that measure the amount of movement occurring along cracks using two overlapping plates which move apart as the crack moves.

J. THRESHOLD VALUE: Predetermined level at where Contractor provides immediate written notice of condition.

K. UTILITY MONITORING POINTS (UMPs): Vertical displacement monitoring points attached to a utility and used to determine elevation changes of utilities over the Project duration.

L. VIBRATING WIRE PIEZOMETER (VWPZ): Instruments installed in a drilled borehole to monitor ground water pressure to determine ground water drawdown.

1.5 PROJECT SITE CONDITIONS

A. See Section 33 05 07.22 Horizontal Auger Boring.

1.6 PERFORMANCE REQUIREMENTS

A. Locate utilities before commencing drilling.

B. Install all instruments indicated on the Contract Drawings prior to shaft and tunnel excavation.

C. Obtain written permission from the property owner and tenant for entry on to or entry into private property to complete the Building and Structures Assessment Plan. Obtain permits as required for instrumentation installation.

D. Drill, grout, and dispose of resultant spoils.

E. Prepare ground and surfaces for instrument installation and testing.

F. Provide access, such as temporary or mobile platforms, and assistance to the Owner during instrumentation installation on or in the temporary works as directed by the Owner.

G. Protect instrumentation from damage during construction and maintain instruments and components. Repair or replace instruments and components damaged during performance of Work, to the satisfaction of the Owner. Immediately provide written notice to Owner of any damage or maintenance problems.

H. Monitor instrumentation; provide data to Owner as specified herein.

I. Perform visual observation of the ground surface during construction operations and note observations and note changes. Document using pictures and measurements.

1.7 QUALITY ASSURANCE

A. Qualifications:
   1. Geotechnical Instrumentation Specialist: Individual shall be a professional engineer registered in the State of California with experience in the installation and maintenance of geotechnical instrumentation similar to that specified herein on at least two prior projects similar in scope and size to this Project. Instrumentation specialist shall prepare and stamp instrumentation shop drawings and supervise and direct instrument installation, instrument readings, and interpretations.
   2. Surveyor: Individual shall be a land surveyor licensed in the State of California for at least five (5) years.
   3. Technicians: Individuals shall be qualified with a minimum of two (2) years of experience in the installation and reading of geotechnical instrumentation similar to those specified herein.
   4. Drillers: Personnel employed for drilling instrumentation boreholes shall have at least four (4) years of direct field experience in drilling boreholes.

B. Product Data: Includes manufacturer’s product description, installation requirements, shop drawings, operation, maintenance procedures, and samples where applicable, as well as description of methods and materials for installing and protecting the instruments, including post installation acceptance tests.

C. Sources of information: All sources shall be widely available within the industry, specific to the purpose, and acceptable to the Owner. Reference shall be specific and include page number.

D. Building and Structures Assessment Plan: Plan documenting the multimedia documentation of pre-construction and post-construction conditions including measurements and photographs documenting the current state of buildings, utilities, and other improvements located within the active zone of the proposed shafts, tunnels, and where written permission has been granted. The purpose of the visual observation is to note any potential ground movement and structure damage that is not recorded by the geotechnical instrumentation.
   1. Permission shall grant equal access to Owner. Permission shall specifically state allowed work, i.e. photographs only or photographs and instrumentation with a detail bill of materials and locations.
   2. Pre-construction and post-construction photographs shall be high-resolution, demonstrate the vertical nature of the feature, include a scale with a time and date stamp, and location file data (global positioning system, GPS).
   3. Take photographs from the public right-of-way or on properties where access permission has been granted.
   4. Post-construction photos shall be of the same orientation and lighting as the corresponding pre-construction photographs.

E. Survey Control Point Installation Procedure: Includes the following:
   1. Method for cleaning the inside of casing.
   2. Grout mix design, including commercial names, proportions of admixtures and water, mixing sequence, mixing methods and duration, pumping methods and tremie pipe type, size, and quantity.
   3. Drill casing or auger type and size.
   4. Depth increments for backfilling boreholes with sand and granular bentonite.
   5. Method for overcoming buoyancy of instrumentation components during grouting.

F. Settlement Surveying and Monitoring Plan: The plan shall identify the location of all instruments; survey control points; surface monitoring points; and survey schedules, procedures, and reporting formats.

G. Installation:
   1. Provide notice to the Owner not less than one (1) workday for instrument installations. Label all instruments with the same identifying instrument number as shown on the Approved Plans or in a manner acceptable to the Owner.
   2. Installation Tolerances: Position all instruments within 12 inches of the horizontal location as specified herein. Position instrumentation to within 6 inches of the specified bottom elevation. Position settlement monitoring points and instrument casings to the more restrictive of two degrees of vertical for the entire depth of each instrument or as required by the manufacturer.
   3. When actual field conditions prevent installation of instruments at the location and elevations specified herein, obtain prior acceptance from the Owner for new instrument location and elevation. The proposed location is to provide similar information.
   4. Shop Drawings: Show installed locations, the instrument identification number, the instrument type, the installation date, and time, established elevations, initial elevations, offset and stationing, initial coordinates and boring log, and the

anchor to tip elevation and instrument length, when applicable. Shop drawings include as-built shop drawings showing each instrument including installation records, depths, lengths, elevations, and dimensions of all key elements.

5. Perform a baseline reading for each instrument which shall include at least three readings from each instrument before commencing underground construction. The three readings are to be completed on three different workdays each requiring a separate set-up. The readings are to provide statistically valid reproducible results allowing for temperature adjustments to both atmosphere and facility. If results are not valid, perform additional daily readings or re-install instrument until readings are reproducible.
6. Submit results within two (2) workdays following readings and not less than three (3) workdays preceding the commencement of excavation.
7. Surveys for monitoring geotechnical instrumentation shall be referenced to the same control points and benchmarks established for setting out the work. Control points shall be tied to benchmarks and other monuments outside of the zone of influence of the underground excavations.
8. Building and Structures Assessment Report: Provide pre-construction and post-construction assessment reports for buildings and structures located within 50 feet of the proposed pipe centerline and shaft perimeters.
9. Tell-Tale Crack Monitors Report: Provide pre-construction and post-construction assessment report for each point.

1.8 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00 and as specified herein.

B. Submittals shall be coordinated with all cross-referenced sections and assembled and submitted as a single, complete, and comprehensive submittal.

C. Where calculations are required to be submitted, they shall be signed and sealed by a Professional Civil Engineer registered in the State of California. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information.

D. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

E. Provide written notifications as specified herein or within one workday when not specified.

F. Bidding Submittal:
   1. Submit a Qualifications Statement with the Bid Proposal submittal which includes qualifications and experience records for the following, as described in Part 1.7.A in this Section:
      a. Contractor performing the Work as specified herein.
      b. Geotechnical Instrumentation Specialist.
      c. Technicians.
      d. Surveyors.
      e. Drillers.

G. Pre-Construction submittals:
   1. Schedule for installation of survey control points as specified herein or at least two (2) weeks prior to installation.
   2. Site specific shop drawings indicating the layout and designation of all control points and monitoring points as specified herein.
   3. Survey control point installation procedure.
   4. The Settlement Survey and Monitoring Plan should describe the proposed methods for monitoring each instrument type.
   5. All instrument manufacturer's product data at least two (2) weeks prior to installation.
   6. All permits required for instrument installation.
   7. Contingency plan in the event ground movement reaches the prescribed Response Values as specified herein.
   8. All instrument baseline readings.
   9. Building and Structures Assessment Plan including photographs.
   10. Construction submittals:
      a. Shop drawings and as-built drawings within five (5) workdays following installation of each instrument.
      b. All instrument readings in a cumulative record on the same workday as the readings are taken or as soon as data is known if excessive ground movement is suspected.
      c. All interpretations within two (2) workdays following readings.
   11. Post-Construction submittals:
      a. Final Building and Structures Assessment Report including comparative photographs.
      b. Signed and sealed cumulative records and interpretations within 4 weeks following instrument removal.
      c. Record of legal destruction of instruments within 4 weeks of instrument removal.

PART 2 PRODUCTS

2.1 MATERIALS

A. Sand: Compatible with manufacturer's written recommendations and ASTM C778.

B. Cement: Shall be Type II Portland cement and water in accordance with ASTM C150 and compatible with instrument manufacturer's written recommendations.

C. Water: Potable including source.

D. Drilling fluid: High yield sodium bentonite.

E. Test all water for pH and treat with soda ash, or accepted equal, to adjust the pH of the water as required in the accepted mix design(s).

F. Bentonite, polymers, and additives, other than soda ash, shall be NSF/ANSI Standard 060 compliant.

G. Cement-Bentonite Grout: 22 lbs. cement; 12 lbs. bentonite; 1.5 gallons water.

H. Bentonite Slurry Grout: 50 lbs. sodium bentonite sealing and plugging agent; 7 lbs. sodium bentonite drilling mud; 32 gallons of water.

2.2 EQUIPMENT AND ANCILLARY CONSTRUCTION MATERIALS

A. Provide as shown on the Approved Plans, specified herein, and acceptable to the Owner.

B. Utility Monitoring Points (UMPs): Provide sensor with accuracy of at least ±0.01 foot.

C. Inclinometers (INC): Provide complete inclinometer systems including all components, accessories, and appurtenances required for a fully operational monitoring system.
   1. An inclinometer system consists of casing installed in a borehole; inclinometer probe, cable, and casing pulley assembly; data collection/readout unit and data processing software. The inclinometer casing is a special purpose, grooved pipe typically installed in boreholes. The inclinometer probe is lowered into the casing attached to the special cable and drawn upwards from the bottom in two passes to measure lateral movement.
   2. Provide complete system including inclinometer probe capable of measuring resolution of 0.005º or better and with a total system accuracy not exceeding ±0.3 inch/100 feet.
   3. Provide inclinometer readout unit compatible with inclinometer probe. Readout unit shall be calibrated by manufacturer prior to shipment.
   4. Provide computer software capable of reducing, analyzing, and plotting the inclinometer data using a personal computer (PC) running Windows.
   5. Grout: Cement bentonite or neat cement grout mix shall be in accordance with manufacturer's requirements. The grout should be installed by the tremie method from the bottom upward to ensure full coupling between casing and surrounding ground.
   6. Automated in-place inclinometers (IPI) may be considered as an optional alternative to manual readings.

D. Settlement Monitoring Points (SMPs): Provide sensor with accuracy of at least ±0.01 foot.

E. Multi-Point Borehole Extensometers (MPBX): Provide multi-point borehole extensometer systems complete with anchors, connecting rods, reference head, and accessories required for monitoring vertical ground deformation. Extensometers may utilize manual or automated data acquisition systems.
   1. Anchors and Rods:
      a. Provide a commercially available multi-point borehole extensometer system manufactured by a firm regularly engaged in the production of geotechnical instrumentation and meeting the performance requirements specified herein.
      b. Hydraulically operated anchors per MPBX installation, set at depths as indicated on the Contract Drawings.
      c. Noncorrosive (stainless steel, or approved alternate) rods individually sheathed in protective tubing.
      d. Rod spacers to space and support rods.
      e. Anchors shall accommodate minimum 2.0 inch (50 mm) heave and 6.0 inch (150 mm) of settlement movement capacity.

f. Fix a level survey point to the top of the reference head of the extensometer to allow precise levelling back to a datum.
g. Provide necessary couplings, caps, fittings, installation tools, and accessories.

2. Vibrating Wire Displacement Transducers:
   a. Where automated monitoring is provided, provide vibrating wire displacement transducers with integral thermistor for temperature compensation.
   b. Measurement Range: Minimum 8 inch (200 mm).
   c. Resolution: 0.01 percent of full scale or better.
   d. Repeatability: ±0.5 percent of full scale or better.
   e. Provide readings from each vibrating wire displacement transducer through a compatible datalogger..
   f. Backfill: Grout backfill mix specified herein.
   g. Surface Protection Box: as specified herein.

F. Vibrating Wire Piezometer (VWPZ):
   1. Piezometers consist of hydraulic pressure sensors capable of providing automatic, continuous measurement of groundwater levels with an electronic data logger.
   2. Provide sensor with accuracy of at least ±0.1 foot.
   3. Piezometers shall provide fully automatic, continuous recording and reporting capabilities using the data loggers, and shall be suitable for installation in a borehole or in an observation well. Data logger shall be compatible with piezometer instrumentation.

G. Tell-Tale Crack Monitors:
   1. Provide sensors with maximum resolution of 0.04 inch (1 mm).

PART 3 EXECUTION

3.1 GENERAL

A. Perform all Work in accordance with accepted submittals and manufacturer’s written recommendations.

B. Comply with all applicable permits.

C. Protect all instruments, components, systems, and utilities from damage.

D. If any instrument is to be located on private property, then the Contractor shall provide a right of entry and waiver in a form acceptable to the Owner from said property owner. Upon installation Include picture before instrument placement and instrument in-place. At end of project include similar pictures of instrument in-place, upon removal of instrument, and following any and all restoration work. Ensure lighting is similar in all cases.

E. Provide the Owner with access to the instrument locations. Installation of the instrumentation by the Contractor does not preclude the Owner, through an

independent Contractor, from installing instrumentation in, on, near, or adjacent to the Work.

F. Maintain a copy of the Contract Documents in a location acceptable to the Owner and accessible to the geotechnical instrumentation specialist and the Owner.

G. Treat and dispose of all water in accordance with the requirements specified in Section 31 23 19 Dewatering.

H. Ensure each instrument is functional for its intended purpose and installed in manner that protects the instrument from damage and the general public from injury.

I. Place all instruments a minimum of ten (10) workdays prior to start of excavation unless otherwise specifically stated otherwise.

J. Locate and avoid drilling into or damaging conduits and other underground facilities.

K. Perform and record baseline readings.

L. Remove and replace any damaged instrument or component that affects the fit, form, or function of the instrument.

M. Markings for each instrument identifying instrumentation name, location, and numbering shall be refreshed weekly or more frequently to ensure legible visibility of its location and unique identifier marking.

3.2 SURVEY

A. Adhere to the following requirements concerning survey oversight:
   1. Perform initial survey and record the horizontal coordinates and elevations within an accuracy of 0.005 feet (1/16 inch) for each survey point location and all subsequent surveys.
   2. Reference survey points so that they are accurately re-established if lost or destroyed.
   3. Perform interim surveys and commence readings at the commencement of shaft and tunnel excavation at the frequency specified herein.
   4. Perform a final survey, meeting the same requirements as the initial survey, of all control points and instruments upon completion of construction operations. Submit final readings as specified herein.

3.3 DRILLING, GROUTING, PREPARATION, ACCESS, AND PROTECTION

A. Drill holes of appropriate size and depth in masonry, concrete and asphalt and cased holes in fills and ground for installation of instruments.

B. Clean holes to remove debris. Holes which the Owner considers unsatisfactory because of misalignment or other irregularities shall be re-drilled as directed by the Owner.

C. Withdraw the casing or auger without rotation so as to prevent ground collapse into the excavated hole.

D. Provide access and temporary facilities, such as power and sufficient general area lighting necessary for installing instruments.

E. Mix grout using equipment capable of thoroughly mixing grout material so that grout is of uniform consistency with no unsuspended solids. Place grout using a tremie method, where applicable, with side discharge ports on tremie pipe.

3.4 UTILITY MONITORING POINTS (UMPS)

A. Provide one (1) UMP for each utility crossed by the trenchless methods.

B. Remove pavement over utility by coring or cutting. Minimize area of pavement removal.

C. Excavate to top of utility using vacuum truck, hand auger, or other suitable method. Do not damage utility during excavation.

D. Construct temporary casing, trench box, or similar protective equipment as required to provide safe support and access for installation of point.

E. Construct bar and pipe riser to protect the UMPs. Maintain centralized alignment throughout installation. Do not allow the bar to contact the inside of the riser pipe.

3.5 INCLINOMETERS (INC)

A. Provide inclinometers, one inclinometer adjacent to each jacking shaft.

B. Inclinometer installation and monitoring shall be in accordance with ASTM D6230 Standard Test Method for Monitoring Ground Movement Using Probe-Type Inclinometers.

C. Inclinometer installations shall be completed at least ten (10) work days in advance of starting adjacent excavations.

D. Drilling operations shall be conducted using appropriate methods that are consistent with anticipated geologic conditions.

E. A baseline survey shall be obtained following grout set and prior to start of construction activities. Baseline readings shall include measurements in both probe orientations.

3.6 SETTLEMENT MONITORING POINTS (SMPS)

A. SMPs shall be located as in the accepted submittals.

B. Grout the casing housing so it is in intimate contact with the ground and as shown in the Contract Drawings.

C. Provide up to six (6) additional surface monitoring points at locations to be determined in the field by the Owner.

3.7 MULTI-POINT BOREHOLE EXTENSOMETER (MPBX)

A. Install and seal MPBXs into boreholes. Install borehole, anchor, rod, and housing in a manner to ensure that the anchor is fixed and that the rod and head are free to move independently of the anchor. Fix a level survey point to the top of the reference head of the extensometer to allow precise levelling back to a datum.

B. Install surface protective box as shown on the Contract Drawings.

3.8 VIBRATORY WIRE PIEZOMETERS (VWPZ)

A. Provide piezometers, one adjacent to each shaft when groundwater is present within 5.0 feet.

B. Each piezometer shall be installed with readout cables extending to a safe distance away where the data logger is mounted securely and protected for the duration of the Project.

3.9 TELL-TALE CRACK MONITORS

A. Provide up to three (3) tell-tale crack monitors per property with a building adjacent to the tunneling and shaft alignments and up to two (2) per vacant property, property without a building.

B. Provide up to 4 additional tell-tale crack monitors at locations to be determined in the field by the Owner.

3.10 MONITORING

A. Frequency: As a minimum, follow the following schedule to determine frequency and duration of the monitoring:

Instrument Type	**Monitoring Frequency within Active Zone (1)**	**Monitoring Frequency outside Active Zone (1)**
Utility Monitoring Point (UMP)	Prior to start of work, every two working hours continuously through the active zone and as specified herein for automatic monitoring, or one to two times per shift for manual monitoring (4)	Weekly/Monthly (2)

Inclinometer (INC)	Prior to start of work, every two working hours continuously through the active zone and as specified herein for automatic monitoring, or one time per shift for manual monitoring (4)	Weekly/Monthly (2)
Settlement Monitoring Point (SMP)	Prior to start of work, every two working hours continuously through the active zone and as specified herein	Weekly/Monthly (2)
Multi-Point Borehole Extensometer (MPBX)	Prior to start of work, every two working hours continuously through the active zone and as specified herein for automatic monitoring, or one time per shift for manual monitoring (4)	Weekly/Monthly (2)
Vibrating Wire Piezometer (VWPZ)	Continuous	Weekly (3)
Tell-Tale Crack Monitors	Prior to start of work, every two working hours continuously through the active zone and as specified herein	Weekly/Monthly (2)

NOTES:

(1) The active zone for tunneling is measured parallel to the tunnel alignment and is 100 feet in front and behind the tunnel face. The active zone for shaft excavation is 50 feet from the open shaft and covers the duration from the start of shaft construction and for four weeks following shaft restoration.

(2) Weekly until movement substantially stops and monthly thereafter. Movement substantially stops when four consecutive, regularly scheduled measurements remain unchanged.

(3) Monitor and report weekly for four weeks following shaft restoration.

(4) Monitoring frequency for manual monitoring is subject to change in the event that unusual movement is captured during excavation.

B. Perform additional monitoring as necessary to control construction and to ensure the safety of the Work.

C. Provide a report with the following:

1. Data sheets containing a cumulative history of readings; including weather conditions, temperature, and proximity of the excavation to the instrument location itself at the time of each reading.
2. A plot of measured values versus time, including a time history of construction activity likely to influence such readings.

D. Interpretation: Data or interpretation shall not be published or disclosed to other parties without advance written permission of the Owner. Provide instrument readings and interpretations of monitoring data to the Owner within the times specified herein.

E. Instrumentation data shall be used as an observational method tool and shall not relieve the Contractor of responsibility for maintaining ground stability and protecting adjacent facilities.

3.11 RESPONSE VALUES

A. Instrument Response Values:

Instrument	Instrument Response Level by Requirement Caltrans
Settlement Monitoring Point (SMP)	±0.008 inch*(H), H or V (H= excavation depth in feet)
Tell-Tale Monitors	±2.0 inch

B. When a given Response Value is reached, the Contractor shall provide verbal notice within one hour upon occurrence, confirming written notice within 1 workday, and respond in accordance with the following:

Contractor Response Level Values		
Threshold Value	**Response Value**	**Shutdown Value**
50%	80%	100%

1. Threshold Value: Provide written notice within 24 hours of occurrence and meet with the Owner within 24 hours of providing notice to discuss means and method to determine what changes, if any, shall be made to better control ground movement. Instrument readings shall be made on a daily basis until five consecutive workdays of readings remain unchanged; at which point the readings will revert to the reading frequency specified herein.
2. Response Value: Provide written notice and meet with the Owner within 24 hours to discuss means and methods to determine what changes shall be made to better control ground movement. Actively control ground movement in accordance with the accepted plan to prevent reaching the Shutdown Value. Instrument readings shall be daily until five consecutive workdays of readings remain unchanged; at which point the readings will revert to the reading frequency specified herein.

3. Shutdown Value: Stop all Work immediately and provide immediate written notice. Meet with the Owner to develop a plan of action before any Work resumes.

C. All measured deflection values are relative to the baseline value identified at the start of construction. Baselines shall not be reset after each bore and shall remain the same for the duration of this Contract.

D. The required responses specified herein shall apply to any visualization of ground movement between monitoring points including sinkholes, rat holes, and other visual forms of ground movement.

3.12 REMOVAL AND SITE RESTORATION

A. Verify with Owner that instrumentation is no longer required.

B. Remove the instrument prior to substantial completion of the Work, unless otherwise indicated.

C. Remove and/or abandon the instrumentation in accordance with the permit.

D. Backfill surface excavations with unshrinkable fill, when within apron, roadways, or sidewalks, and with selected fill when outside of such areas up to the underside of surface restoration.

E. Steel casings shall be removed to a minimum depth of five (5) feet below ground surface.

F. Surfaces affected by installation of instruments shall be restored to their original condition prior to completion of Work.

END OF SECTION

SECTION 31 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.

B. Related Sections:
   1. Section 02 41 00 - Demolition

1.2 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Within five (5) working days of Award of Contract, Contractor shall submit a site-specific Disposal Plan for site work, outlining work areas, methods, start work dates, equipment and crew types to perform the work as well as hazardous material handling and disposal plans.

C. Submittal shall include a list of all materials generated during construction activities that will require off-haul. Working with the Engineer, the Contractor shall develop a list of off-site refuse disposal facilities, including contact information and list of items accepted for disposal at identified facility consistent with the Disposal Plan.

D. Written proof the proposed disposal/recycling locations are permitted to receive said materials

1.3 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. All vegetation areas proposed for removal are to be marked by the Contractor and approved by the Engineer.

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.

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.

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, relandscaped, 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 topsoil from site.

E. The Contractor shall handle and dispose of unsuitable and excess material legally, at refuse facility outside the Project site.

END OF SECTION

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SECTION 31 23 16

EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Soil densification.
   2. Excavating for building foundations.
   3. Excavating for paving and parking areas.
   4. Excavating for slabs-on-grade.
   5. Excavating for site structures.

B. Related Sections:
   1. Section 31 05 13 - Soils for Earthwork
   2. Section 31 23 17 - Trenching
   3. Section 31 23 23 - Fill.
   4. Section 33 14 16 - Site Water Utility Distribution Piping.

1.2 REFERENCES

A. Local utility standards when working within 24 inches of utility lines.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.4 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.

C. Protect utilities indicated to remain from damage.

D. Protect plant life, and other features remaining as portion of final landscaping.

E. Protect bench marks, survey control points and existing structures from excavating equipment and vehicular traffic.

3.2 EXCAVATION

A. Excavate subsoil to accommodate utilities, structures, channels, swales, and other improvements.

B. Compact backfills in accordance with Section 31 23 23 and Section 31 23 17.

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 as specified in Section 31 23 23.

H. Notify Engineer of unexpected subsurface conditions.

I. Correct areas over excavated with structural fill Type specified in Section 31 23 23.

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.

B. Request visual inspection of bearing surfaces by Geotechnical Engineer before installing subsequent work.

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 17

TRENCHING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Excavating trenches for utilities from 5 feet outside building to utility service.
2. Compacted fill from top of utility bedding to subgrade elevations.
3. Backfilling and compaction.

B. Related Sections:
1. Section 31 05 13 - Soils for Earthwork
2. Section 31 05 16 - Aggregates for Earthwork
3. Section 31 23 16 - Excavation.
4. Section 31 23 23 - Fill
5. Section 33 14 16 - Site Water Utility Distribution Piping

1.2 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).

1.3 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

1.4 SUBMITTALS - Not Used

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with Caltrans Standard Plans.

1.6 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.7 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. Select 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 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.

3.2 PREPARATION

A. Notify affected utility companies not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum locations.

C. Protect plant life, lawns, and other features remaining as portion of final landscaping.

D. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

E. Maintain and protect above and below grade utilities indicated to remain.

F. Establish temporary traffic control when trenching is performed in public right-of-way. Relocate controls as required during progress of Work.

3.3 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 Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. When side walls cannot be sloped, provide sheeting and shoring to protect excavation as specified in this section. Provide shoring as required by OSHA.

I. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth as directed by Engineer until suitable material is encountered.

J. Cut out soft areas of subgrade not capable of compaction in place. Backfill with course aggregate and compact to density equal to or greater than requirements for subsequent backfill material.

K. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

L. Correct areas over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Engineer.

M. Remove excess subsoil not intended for reuse, from site.

N. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.

3.4 SHEETING AND SHORING

A. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.

B. Support trenches more than 5 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.

C. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.

3.5 BACKFILLING

A. Backfill trenches 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 fill material in continuous layers and compact.

D. Place material in continuous layers as follows:
   1. Select 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.

E. Employ placement method that does not disturb or damage, utilities in trench.

F. Maintain optimum moisture content of fill materials to attain required compaction density.

G. 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.

H. Protect open trench to prevent danger to the public.

3.6 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus ½ inch (0.04 feet) from required elevations.

C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.7 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 D1556, or 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 200 feet of trench.

3.8 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 during construction.

END OF SECTION

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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 RELATED SECTIONS

A. Related work specified in other sections:
   1. Section 01 55 50 Temporary Traffic Control System
   2. Section 31 23 30 Shoring and Trench Safety
   3. Section 33 05 07.22 Horizontal Auger Boring

1.3 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 Owner and designed by a Civil Engineer who is registered in the State of California and who has experience in this type of work.

B. Data Available for Examination. Reports of subsurface are available to the Contractor for examination. This data will be made available for information only.

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 Owner immediately if potential contamination is encountered.

1.4 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, quantities, and locations of wells, 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 50 – Temporary Traffic Control System

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. Dewatering shall be sufficient to maintain excavation stability and to provide at least 3 feet of clearance below the bottom of the planned excavations during construction, unless noted otherwise. Maintain dewatering systems in continuous operation until the involved work is completed, including the placing and compaction of backfill materials in the dry.
   1. See Section 33 05 07.21 Shaft Construction for additional dewatering requirements.

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:
   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.
   3. Discharge (by permit) 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. Contractor shall submit a dewatering plan.

F. 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. Measures to reduce construction noise are listed in the Specification Section 01 50 00 in addition to those measures listed below.

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. Groundwater control operations shall be prosecuted and maintained 24 hours a day, 7 days a week. Qualified personnel shall be on-site at all times to monitor system operations and to perform maintenance as necessary to keep the system in operation.

F. Provide a generator and all equipment necessary to provide a backup electrical power source in the event of a power service interruption.

G. 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 23

FILL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Backfilling building perimeter to subgrade elevations.
   2. Backfilling site structures to subgrade elevations.
   3. Fill under slabs-on-grade.
   4. Fill under paving.
   5. Fill for over-excavation.

B. Related Sections:
   1. Section 31 05 13 – Soils for Earthwork
   2. Section 31 05 16 – Aggregates for Earthwork
   3. Section 31 23 16 - Excavation.
   4. Section 31 23 17 – Trenching.

1.2 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).

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data for geotextile fabric indicating fabric and construction.

1.4 SUSTAINABLE DESIGN SUBMITTALS

A. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
   1. Materials Resources Certificates:

a. Certify source and origin for reused products.
b. Certify recycled material content for recycled content products.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with Caltrans Standard Plans

PART 2 PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS

A. Materials and Resources Characteristics:
1. Recycled Content Materials: Furnish materials with maximum available recycled content including:
a. Select Fill
b. Coarse Aggregate Subbase and Base

2.2 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, dampproofing, or waterproofing installation has been inspected.

C. Verify structural ability of unsupported walls to support loads imposed by fill.

3.2 PREPARATION

A. Compact subgrade to density requirements for subsequent backfill materials.

B. 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.

C. Scarify subgrade surface to depth of 6 inch.

D. Proof roll to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.3 BACKFILLING

A. Backfill areas to contours and elevations specified.

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 other work.

E. Maintain optimum moisture content of backfill materials to attain required compaction density.

F. Backfill against supported foundation and retaining walls. Do not backfill against unsupported foundation and retaining walls.

G. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.

H. Slope grade away from building minimum 2 percent slope for minimum distance of 10 ft, unless noted otherwise.

I. Make gradual grade changes. Blend slope into level areas.

J. Remove surplus backfill materials from site.

K. Leave fill material stockpile areas free of excess fill materials.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Top Surface of Backfilling Within Building Areas: Plus or minus 1 inch from required elevations.

C. Top Surface of Backfilling Under Paved Areas: Plus or minus 1/2 inch from required elevations.

D. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.5 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 D1556 or ASTM D6938.
2. Moisture Tests: ASTM D6938.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

E. Frequency of Tests: one test for each 1,000 square feet of each lift of fill material.

F. Proof roll compacted fill surfaces under slabs-on-grade and paving.

3.6 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.

3.7 SCHEDULE

A. Interior Slab-On-Grade:
1. Select Fill, compacted to 95 percent.
2. Cover with Structural Fill, compact uniformly to 95 percent of maximum density.

B. Exterior Side of Foundation Walls and Retaining Walls:
1. Select Fill, to subgrade elevation. Each lift, compact uniformly to 90 percent of maximum density.

C. Fill Under Grass and Landscaped Areas:
1. Select Fill, to 6 inches below finish grade, compact uniformly to 80 percent of maximum density.

D. Fill For Berming:
1. Select Fill, to 12 inches below finish grade, compact uniformly to 80 percent of maximum density.

E. 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.

F. Fill to Correct Over-excavation:
1. Select Fill, flush to required elevation, compact uniformly to 95 percent of maximum density.

END OF SECTION

SECTION 31 23 30

SHORING AND TRENCH SAFETY

PART 1 GENERAL

1.1 SUMMARY OF SECTION

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 RELATED SECTIONS

A. Related work specified in other sections:
   1. Section 31 23 19 Dewatering

1.3 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.

1.4 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.

1.5 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.

1.6 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.

1.7 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
      b. 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.
      c. Groundwater will 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 will be completed at the Contractor’s expense.
      d. 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.
      e. 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

3.01. REMOVAL OF SHORING

B. 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.

C. Minimum compaction requirements must be met after shoring is removed.

PART 4 TESTING

No field testing is required.

END OF SECTION

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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 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).

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Materials Source: Submit name of imported materials suppliers and Test Data.

1.4 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. Aggregates for Earthwork: 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 as indicated on Drawings.

B. Roller compact aggregate to 95 percent maximum density per ASTM D698.

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 D1556 or ASTM D6938.

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.

3.6 COMPACTION

A. Compact materials to 95 percent of maximum density.

END OF SECTION

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SECTION 32 12 16

HOT MIX ASPHALT PAVEMENT AND OVERLAYS

PART 1 GENERAL

1.1 DESCRIPTION

A. This section covers all material, equipment and labor required to construct hot mix asphalt pavement, including, but not limited to, placement of hot mix asphalt paving, tack coat, and temporary pavement.

B. Note: Aggregate base placed for street reconstruction is not covered in this section. Refer to Section 39-1.09B, “Subgrade” of the Caltrans Standard Specifications, and Section 31 23 16 - “Excavation” of these specifications for aggregate base roadbed specifications and additional requirements.

1.2 QUALITY ASSURANCE

A. All materials shall conform to the applicable sections of the Caltrans Standard Specifications unless otherwise specified in these Specifications or on the Plans. In addition, all materials testing performed to provide quality assurance shall be performed in accordance with Section 01 40 00 Quality Requirements of these specifications.

1.3 SUBMITTALS

A. Submittals shall include, but not be limited to, the following items:
   1. Job mix formula per Caltrans Standard Specifications Section 39-1.03C for all hot mix asphalt material being used on the project.
   2. Load slips for all material delivery trucks shall be delivered to the job site with the truck. The Contractor shall retain all load slips, and shall make them available to the Engineer upon request.

PART 2 PRODUCTS

2.1 TEMPORARY HOT MIX ASPHALT PAVEMENT

A. Temporary pavement shall be hot mix asphalt conforming to the provisions of Section 39, “Hot Mix Asphalt” of the Caltrans Standard Specifications, plant mixed method. ”Cold mix" asphalt concrete containing SC-800 liquid asphalt may be used for temporary pavement.

2.2 TYPE “A” HOT MIX ASPHALT

A. Type “A” hot mix asphalt shall conform to the requirements for Type “A” hot mix asphalt with 1/2-inch HMA Type grading as specified in Section 39, “Hot Mix Asphalt” of the Caltrans Standard Specifications.

B. Asphalt binder for Type “A” hot mix asphalt shall be PG 64-16, as specified in Section 92, “Asphalts” of the Caltrans Standard Specifications. The amount of asphalt binder shall be determined by California Test 367 and provide a mix in conformance with Section 39-1.03B and approved by the Engineer.

2.3 OPEN GRADED FRICTION COURSE

A. Open graded friction course (OGFC), when specified, shall conform to the provisions of Section 39, “Hot Mix Asphalt” of the Caltrans Standard Specifications. Aggregate for OGFC shall conform to Section 39-1.02E OGFC table per the size shown on the plans.

B. Asphalt binder used for Open Graded hot mix asphalt pavement shall be PG 64-16 as specified in Section 92: “Asphalts” of the Caltrans Standard Specifications. The optimum amount of asphalt binder shall be determined by California Test 368 and approved by the Engineer.

2.4 PRIME COAT

A. Prime coat on aggregate base course will not be required.

2.5 TACK COAT

A. Paint binder (tack coat) shall be applied in one application at a rate of from 0.02-gallon to 0.10-gallon per square yard of surface covered. Tack coat shall conform with, and applied in conformance with Section 94, “Asphaltic Emulsions” of the Caltrans Standard Specifications. Tack Coat shall be type SS1 or RS1, and shall be applied to all vertical surfaces of existing pavement, curbs, gutters and construction joints.

2.6 SEAL COAT

A. No seal coat will be required.

2.7 PAVEMENT REINFORCING FABRIC

A. Pavement reinforcing fabric, if required, shall conform to Section 88-1.02J, “Paving Fabric” of the Caltrans Standard Specifications.

2.8 AGGREGATE BASE and SUBBASE

A. Aggregate base shall be Class 2 aggregate base and shall conform to the provisions in Section 26 “Aggregate Bases” of the Caltrans Standard Specifications and in addition the aggregate shall have at least 50% crushed coarse particles with at least one fractured face using Caltrans Test Method 205.

B. Aggregate for Class 2 aggregate base shall be free from organic matter and other deleterious substances and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base.

PART 3 EXECUTION

3.1 PAVEMENT REMOVAL

A. Pavement Grinding

1. Pavement grinding, when required, shall be performed in accordance with the requirements of Section 42-3, “Grinding,” of the Caltrans Standard Specifications, as specified in these Special Provisions, and as directed by the Engineer.

2. The Contractor shall exercise care to avoid damaging existing concrete curbs and drainage facilities during all grinding operations. Damage to existing improvements shall be repaired at the Engineer’s direction, and at the sole expense of the Contractor.

3. Prior to conducting grinding operations, the Contractor shall remove all weeds and dirt in the gutters and in cracks in the existing pavement surface to the satisfaction of the Engineer. The Contractor will not be permitted to use herbicides, and the method of weed removal shall be subject to the approval of the Engineer.

4. The Contractor shall completely remove all existing raised reflective markers from the street areas being ground.

5. The street shall be swept throughout the course of the grinding operations and shall be left thoroughly clean and clear of all grindings at the end of each working day. The Contractor shall exercise care to avoid spilling grindings into drainage inlets and cross-corner or cross-street` culverts, and shall promptly clean out any grindings that do spill into inlets or culverts.

6. Prior to initiation of grinding operations, the Contractor shall lower all traffic boxes and manhole lids and frames within the limits of the work.

7. Abrupt edges shall not be left in place when traffic is allowed back into the grinding area. Where abrupt edges exist (mid-block or on cross streets or alleys), or where directed by the Engineer, the Contractor shall build a transition ramp no shorter than 25 feet long that spans the entire length or width of the abrupt edge, lifting traffic out of the ground area and onto the surrounding pavement.

8. All A.C. grindings shall be disposed of by the Contractor.

B. Pavement Sawcutting

1. General
   a. Pavement sawcutting shall be performed with a wheel roller, pneumatic pavement cutter, or other sawcutting equipment approved by the Engineer. Depending upon the nature of the work, the sawcutting may be divided into two parts - initial sawcutting and final sawcutting

2. Initial Sawcutting
   a. All initial pavement sawcutting shall be to the full width required for the excavation, and to the full depth of the pavement, regardless of depth. All pavement material inside the sawcut limits shall be completely removed.

   b. Initial pavement sawcuts shall be straight and shall provide clean, solid, vertical faces free from loose or cracked material. All damaged or disturbed adjoining pavement shall be sawcut and removed.

3. Final Sawcutting
   a. Final sawcutting shall only be required where “T”-section trenches are shown on the Plans.

   b. All final sawcutting shall be made 6 inches wider on all sides than the width of the excavation, to the full depth of the pavement, regardless of depth, and after excavations have been backfilled. All pavement material inside the sawcut limits shall be completely removed. Final sawcutting shall be performed on all cross-street and cross-corner culverts, curbs, gutters, sidewalks, driveways, as shown on the Plans, and as directed by the Engineer.

   c. Final pavement sawcuts shall be straight and shall provide clean, solid, vertical faces free from loose or cracked material. All damaged or disturbed adjoining pavement shall be sawcut and removed. When possible, sawcuts shall be either parallel or perpendicular to the roadway centerline.

   d. The number of jogs in the sawcut lines shall be held to minimum and shall be subject to approval by the Engineer. The Contractor may be required to remove additional undisturbed pavement if, in the opinion of the Engineer, the lines are too erratic or contain too many jogs.

3.2 TEMPORARY PAVEMENT CONSTRUCTION

A. In all paved areas disturbed by the work, the Contractor shall install a minimum of 2 inches of temporary pavement before traffic is allowed back onto the area. The temporary surface shall be maintained by the Contractor at all hours of the day including non-working hours. The grade of temporary pavement shall be maintained to within one-half inch of the grade of adjacent roadway pavement until final pavement is installed, and shall be compacted such that the surface of the temporary pavement is flat. Temporary pavement shall be provided even if the existing pavement is to be removed later in street reconstruction.

B. Installation of temporary pavement by the Contractor prior to the obtaining of final compaction tests by the Engineer will in no way relieve the Contractor of obtaining final compaction before the required final paving is started. Temporary paving shall be removed in its entirety prior to placement of final pavement.

3.3 PERMANENT PAVEMENT CONSTRUCTION

A. The production, hauling, placing, compacting, and finishing of hot mix asphalt shall conform to Section 39, “Hot Mix Asphalt” of the Caltrans Standard Specifications.

1. Subgrade Preparation
   a. Subgrade shall be prepared in accordance with Section 39-1.09, “Subgrade, Tack Coat, and Geosynthetic Pavement Interlayer” of the Caltrans Standard Specifications and Section 31 23 17 Trenching of these specifications.

2. Roadway Base Placement
   a. Roadway base shall be placed and compacted in accordance with Section 26, “Aggregate Bases” of the Caltrans Standard Specifications and Section 32 11 23 Aggregate Base Courses of these specifications.

3. Tack Coat
   a. Prior to placing tack coat on existing pavement surfaces, the existing surface shall be swept clean of all dirt and dust.

   b. Tack coat (paint binder) shall be applied to all surfaces against which new hot mix asphalt pavement is to be placed in accordance with Section 39-1.09, “Subgrade, Tack Coat, and Geosynthetic Pavement Interlayer” of the Caltrans Standard Specifications. When being applied for paving fabric installation, tack coat shall extend 3 inches beyond the width of the paving fabric on all sides.

4. Pavement Reinforcing Fabric
   a. Pavement reinforcing fabric, when specified, shall be installed immediately after the tack coat is applied, in accordance with Section 39-1.09, “Subgrade, Tack Coat, and Geosynthetic Pavement Layer” of the Caltrans Standard Specifications. The fabric shall be aligned and placed with no wrinkles that lap. Adjacent borders of the fabric shall be lapped 2 to 4 inches.

   b. Seating of the fabric with rolling equipment after placement will be permitted. Turning of material trucks and the paving machine shall be kept to a minimum to avoid pulling the fabric away from the tack coat.

5. Hot Mix Asphalt Placement
   a. All hot mix asphalt shall be installed in accordance with Section 39, “Hot Mix Asphalt” of the Caltrans Standard Specifications. Unless lower temperatures are approved by the Engineer, all mixtures (except OGFC) shall be spread, and the first coverage of initial and breakdown compaction performed, when the temperature is not less than 250°F (120°C), and all breakdown compaction shall be completed before the temperature of the mixture drops below 200°F (95°C). Type “A” hot mix asphalt shall be placed only when the atmospheric temperature is above 50°F (10°C). Failure to meet temperature restrictions is grounds for rejection of the work by the Engineer.

   b. OGFC shall be spread at a temperature of not less than 200°F (95°C) and not more than 250°F(120°C), measured in the hopper of the paving machine. OGFC shall be placed only when the atmospheric temperature is above 50°F (10°C). Failure to meet temperature restrictions is grounds for rejection of the work by the Engineer.

   c. When spreading hot mix asphalt, the maximum screed width of any one pass shall be as directed by the Engineer. Compaction shall conform to Section 39-3, “Method Construction Process” of the Caltrans Standard Specifications.

   d. The completed surface shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the hot mix asphalt by rollers, rakes, or other equipment shall be eliminated immediately.

6. Surface Tolerance
   a. The finished surface of all permanent hot mix asphalt and OGFC shall conform to Section 39-1.12, “Smoothness” of the Caltrans Standard Specifications.

END OF SECTION

SECTION 32 92 19

SEED AND MULCH

PART 1 GENERAL

1.1 REQUIREMENTS

A. Provide all material, labor and equipment necessary to perform the Work for soil preparation, seeding, and mulching as indicated on the Plans and as specified herein. The work of this Section includes but is not limited to:
   1. Soil preparation.
   2. Seeding.
   3. Applying straw and tackifier.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Section 01 50 00 – Temporary Facilities and Controls

B. Section 31 25 00 – Erosion and Sediment Control

C. Section 31 23 16 - Excavation

1.3 MEASUREMENT AND PAYMENT

A. Refer to Section 01 15 00 – Measurement and Payment.

1.4 REFERENCE STANDARDS

A. Nomenclature:
   1. The Jepson Manual: *Vascular Plants of California, Second Edition*, University of California Press, Berkeley, CA.

B. California Seed Law (California Department of Food and Agriculture). More information is available online at:
   1. http://www.cdfa.ca.gov/plant/pe/nursery/pdfs/SeedLaw_2011.pdf
   2. http://www.cdfa.ca.gov/phpps/pe/nursery/Seed.html

C. All standards shall include the latest additions and amendments as of the date of advertisement for bids.

D. American Society for Testing and Materials (ASTM):
   1. D7047-04: Standard Test Method for Mucilloid Content of *Plantago Insularis* (Ovata, Psyllium) Used as a Tackifier.

1.5 SUBMITTALS

A. General: Submittals to be in accordance with the requirements of Section 01 33 00 - Submittal Procedures.

B. Prior to application, Contractor shall submit to the Owner a signed acknowledgment from each supplier indicating that the seeding material meets requirements specified herein.

C. Contractor shall submit the following:
   1. For Contractor-provided seed: A letter, or appropriate seed lot tags, from seed supplier stating the botanical name, common name, provenance, minimum percent purity, minimum percent germination, and pounds pure live seed of the seed mix prior to application.
   2. Proof that the tackifier meets the Specifications described in this Section.
   3. Prior to delivery of straw to Project site, submit the name, address, and telephone number of the straw supplier and proof that the straw meets the Specifications described in this Section.
   4. Hydroseeding and hydromulching: Proposed areas and proposed methods for hydroseeding and hydromulching.

D. In the event that the Contractor chooses to force germinate, the Contractor shall submit a shop drawing of the proposed irrigation system as described in this Section.

1.6 TIMING AND COORDINATION

A. Timing of seeding application is subject to the timeframes and conditions specified in sub-Section Broadcast Seeding.

B. Timing of soil preparation, seeding, and mulching work shall be coordinated and sequenced with other project work.
   1. All earthwork and grading of the site shall be complete prior to beginning soil preparation.
   2. Prior to installation of any biodegradable mat or erosion control blanket, the application of seed, straw, and tackifier shall be approved by the Owner in all areas receiving biodegradable mat and erosion control fabric.

C. Seeding shall be completed prior to October 31st, or as otherwise approved by the Owner.

D. For site access and water supply for optional force germination (per Sub-Section Force Germination), Contractor shall coordinate with the Owner.

PART 2 PRODUCTS

2.1 GENERAL

A. Materials not conforming to these Specifications and requirements shall remain the property of Contractor and shall be removed from Project site at no additional cost to the Owner.

2.2 SEED

A. Seed – General

1. All seed shall be provided by the Contractor at the proportions presented in the following table:

Table 1. Erosion Control Seed Mix

Scientific Name	Common Name	Pounds of Pure Live Seed/Acre
Agrostis pallens	western bentgrass	5
Elymus glaucus	blue wild rye	10
Festuca californica	California fescue	10
Trifolium wildenovii	Tomcat clover	5
Triticum X Elymus	Regreen	20
TOTAL		50

2. Legume seed shall be pellet-inoculated as provided in bulletin AXT-280 of the University of California Cooperative Extension, “Pellet Inoculation of Legume Seed.”
3. Inoculum sources shall be species-specific and shall be applied at a rate of two (2) pounds of inoculum per one hundred (100) pounds of seeds.
   a. Legume seed shall be sown within ninety (90) calendar days after inoculation or shall be re-inoculated prior to sowing.
   b. Inoculated legume seed shall have a calcium carbonate coating.

B. Seed
1. Seed shall be a fresh, clean, new crop mixed by dealer and packaged in dealer's unopened container with original label. Containers opened prior to inspection or without a label or tag will not be accepted. Each seed bag shall be delivered to Project site sealed and clearly marked as to the species, purity, percent germination, weed seed, inert material, dealer’s guarantee, and date of test.
2. All Contractor-provided seed shall comply with the California Seed Law. Commercially obtained seed shall be labeled under the California Food and Agricultural Code, and by the vendors supplying the seed. The percent of weed seed shall not exceed 1.5 percent by weight of the total seed mixture.
3. Contractor-provided seed shall have been tested for purity and germination not more than fifteen (15) months prior to the application of the seed.
4. Seeds shall be obtained from regionally appropriate sources. Seed collected from within coastal Humboldt County is preferable and seed from alternative coastal sources between San Francisco Bay and Coos Bay will be subject to Owner’s approval. Contractor shall coordinate with the Owner thirty (30) working days prior to seeding to obtain these approvals. Seed may be available from Pacific Coast Seed, 533 Hawthorn Place, Livermore, CA (925) 373-4417; Hedgerow Farms, 21740 County Road 88, Winters, CA (530) 662- 6847; S & S Seeds, P.O. Box 1275 Carpinteria, CA (805) 684-0436; Larner Seeds, 235 Grove Rd, Bolinas, CA (415) 868-9407; Sunmark Seeds, 18032 NE Airport Way, Portland, OR (888) 214-7333; or approved equal.

2.3 WATER

A. Water shall be non-saline, suitable for agricultural use, shall be free of harmful substances that would adversely affect plant growth or vigor.

2.4 TACKIFIER

A. Tackifier shall be non-asphaltic, non-toxic to plants and wildlife, and non-staining to rock surfaces. Tackifier shall be in powder form, may be re-emulsifiable, and shall be a processed organic adhesive derivative of *Plantago insularis* (per ASTM D7047-04) used as a soil binder, manufactured to be suitable for seeding applications.

2.5 FIBER

A. Fiber material shall be wood cellulose fiber containing no growth or germination-inhibiting factors. Natural wood cellulose fiber shall have the property of dispersing readily in water and shall have no toxic effect when combined with other material. The homogenous slurry or mixture shall be capable of application with power spray equipment. A green colored dye which is non-injurious to seed growth shall be used. Wood cellulose fiber shall be packaged in new label containers marked by the manufacturer to show the air-dry weight content.

2.6 STRAW

A. Straw shall be either rice or wheat derived from irrigated cropland. Straw shall not contain glass, plastic, metal, rocks, or other inorganic material. Straw shall not have been used previously for any other use and shall be certified weed free.

2.7 BROADCAST SEEDING EQUIPMENT

A. An all-terrain vehicle (ATV) / tractor mounted or pulled broadcast spreader or “belly grinder” manual type seeder, or approved equal, shall be used to broadcast seed.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

A. Contractor shall request and receive approval from the Owner prior to commencing soil preparation, seeding, and mulching work.

B. Contractor shall inspect Project site and become familiar with any access requirements, access restrictions, and any other site conditions.

C. Contractor shall notify the Owner, in writing, of soil conditions encountered that Contractor considers detrimental to the growth of plant material.
   1. When detrimental conditions are uncovered, planting shall be discontinued until instructions to resolve these conditions are received from the Owner.

D. Work described in this Section shall not be performed during muddy or frozen conditions.

E. Contractor shall coordinate with the Owner to schedule inspections at the following stages.
   1. Inspection during soil preparation.
   2. Acceptance of soil preparation.
   3. Inspection during seeding and mulching.
   4. Acceptance of seeding and mulching.

F. Progress inspections: In addition to the inspections specified, the Owner may make periodic progress inspections.

G. The Owner reserves the right to take and analyze samples of materials for conformity to these Specifications at any time.

3.2 SOIL PREPARATION

A. Timing
   1. Work in this Section shall not commence until:
      a. All earthwork has been completed.
      b. Contractor has requested and received approval from the Owner.

B. Layout
   1. Soil preparation shall occur in all areas to be seeded as shown on the Plans, and any additional areas disturbed by construction (including non-paved access, staging, stockpiling, and haul routes necessary to access sediment application areas) to be seeded as specified herein.
   2. Contractor shall coordinate with the Owner to confirm the limits of soil preparation.

C. Soil Preparation
   1. Contractor shall review soil preparation areas for presence of rock, debris, chemicals, or other harmful substances and notify the Owner if such conditions are observed.
   2. Contractor shall prepare the soil as follows in areas to be seeded:
      a. Scarify mechanically to a depth of two (2) inches using a harrow, lightweight ring-roller/cultipacker or by hand methods, and as approved by the Owner.
      b. In areas where excessive compaction has occurred such as haul routes and staging areas, at the discretion of the Owner, the Contractor shall disk, till, or rip to a depth of twelve (12) inches and then smooth with a cultipacker, harrow, or track-walk. In sloped areas, equipment track marks shall be oriented parallel to slope contours and shall have a relative compaction less than ninety (90) percent.
      c. Contractor shall protect Work from ruts and compaction until seeding occurs per Sub-Section Broadcast Seeding.

3.3 BROADCAST SEEDING

A. General
   1. Contractor may propose hydroseeding application as an alternative to broadcast seeding. Areas and methods shall be submitted to and are subject to Owner approval.

2. Contractor may propose drill seed application as an alternative to broadcast seeding. Areas and methods shall be submitted to and are subject to Owner approval.

B. Timing
1. Seeding shall occur upon completion of soil preparation work and upon request and receipt of approval by the Owner.
2. Seed shall be applied before the onset of winter rains.
3. Seeding shall be completed by October 31st, unless otherwise approved by the Owner.
4. Contractor shall keep all seed in a cool, dry, shaded place until utilized.
5. Contractor shall coordinate with the Owner no less than five (5) working days prior to seeding so that the Owner can be present during seed application.
6. Work shall be performed only at times when weather conditions at Project site are favorable. No Work shall be performed when wind conditions prohibit uniform distribution of seed unless approved by the Owner. No Work shall be performed and no equipment shall be operated when soils are saturated.

C. Layout
1. Seed shall be applied in accordance to the areas shown on Plans and any additional areas impacted by construction; including unpaved access, staging, stockpiling, and haul routes necessary to access sediment application areas.
2. Contractor shall flag all seeding areas and the Owner shall approve all areas to be seeded prior to seeding.
3. Contractor shall limit foot and equipment traffic and storage of supplies in seeded areas.

D. Preparation of Seeding Areas
1. Soil preparation within seeding areas shall occur prior to broadcast seeding per Sub-Section Soil Preparation.
2. Clear all areas to be seeded of substantial debris and any other impediments to seed-soil contact.

E. Seed Application
1. Seed shall be delivered to the Project site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.
2. Limit foot traffic and storage of supplies in seeded areas.
3. Apply the seed mix evenly and at the rates specified in the tables in Sub-Section Seed.
4. Any remaining seed shall be applied evenly to the areas shown on the Plans.
5. Contractor shall use appropriate equipment such as a rake or light harrow immediately after application to lightly cover seed with 1/8-inch to ¼-inch layer of soil. Seed cover shall not exceed ¼ inch.
6. After the site has been seeded, straw shall be applied per sub-Section Straw and Tackifier Application.

3.4 STRAW AND TACKIFIER APPLICATION

A. General

1. Contractor may propose hydromulch application as an alternative to blown straw. Areas and methods shall be submitted to and are subject to Owner approval.
2. Contractor may propose crimping straw as an alternative to tackifing. Areas and methods shall be submitted to and are subject to Owner approval.

B. Timing: Straw and tackifier shall be applied within the same day following approval of seeding by Owner.

C. Layout:
   1. Straw and trackifier shall be applied to all seeded areas.

D. Straw shall be applied as follows:
   1. Straw shall be applied using a mechanical blower or by hand labor at a rate of 2,000 pounds per acre.
   2. Straw shall be applied uniformly.
   3. Where biodegrable mat and/or erosion control blanket are to be placed, only seed shall be applied, no straw

E. Non-asphaltic tackifier shall be applied to straw at a rate of 120 pounds per acre.

F. Fiber shall be applied (with the tackifier) at a rate of 500 pounds per acre.

3.5 FORCE GERMINATION OF SEED

A. If required, the following specifications shall apply to any force germination of seed.

B. Timing and Duration
   1. Contractor shall commence force germination of seed following completion of broadcast seeding, straw, tackifier application, biodegradable mat installation, and erosion control blanket, and acceptance of this work by the Owner.

C. Water Supply
   1. Contractor shall coordinate with water source with Owner.

D. Application Method
   1. Water shall be applied to the seeded areas using a temporary on-grade spray irrigation system sufficient to provide an even precipitation rate of 0.25 inches of water to all areas at a frequency of one event every three (3) days, or as otherwise approved by the Owner.
      a. Contractor shall provide and install impact rotors in a quantity to cover seeded areas and sufficient to meet the specified precipitation rate.
      b. Prior to broadcast seed application, Contractor shall meet the Owner onsite to determine the layout of the rotors. Following this meeting, Contractor shall submit a shop drawing showing the layout of all irrigation equipment, piping, and points of connection, as well as flow and demand calculations, for approval by the Owner prior to installation of the system.
      c. Contractor shall prevent runoff during irrigation. Any runoff or bank erosion resulting from force germination that does occur shall be repaired to the design grade and reseeded per these specifications at no additional cost to the Owner.

E. System Removal
   1. Unless otherwise directed by the Owner, Contractor shall remove all components of the temporary irrigation system following completion of force germination and acceptance of work.

3.6 SITE CLEANUP

A. Contractor shall cleanup following soil preparation, seeding, and mulching activities as follows and as directed by the Owner:
   1. Remove all containers, packaging, and other debris resulting from seeding operations.
   2. Dispose of all debris legally at licensed disposal facilities.
   3. Clean all surfaces not designated for treatment and remove all residues resulting from mixing, applying, or equipment flushing.
   4. Remove temporary items.

B. Seeded or mulched areas disturbed by subsequent construction activities shall be re-seeded or re-mulched within five (5) working days of the completion of such activities.

3.7 ACCEPTANCE OF SEEDING

A. Acceptance of Work:
   1. The Owner will accept work when all improvements and corrective work have been performed to the satisfaction of the Owner.

END OF SECTION

SECTION 33 01 32

SEWER AND MANHOLE TESTING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Testing Gravity Sewer Piping:
      a. Low-pressure Air Test.
   2. Deflection Testing Plastic Piping.
   3. Testing Manholes:
      a. Vacuum Test.
      b. Exfiltration Test.

B. Related Sections:
   1. Section 33 31 00 - Sanitary Utility Sewerage Piping.

1.2 REFERENCES

A. ASTM International:

B. ASTM C1244 - Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.

C. ASTM D2122 - Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Submit the following prior to start of testing:
   1. Testing procedures.
   2. List of test equipment.
   3. Testing sequence schedule.
   4. Provisions for disposal of flushing and test water.
   5. Certification of test gauge calibration.
   6. Deflection mandrel drawings and calculations.

C. Test Reports: Indicate results of manhole and piping tests.

PART 2 PRODUCTS

2.1 AIR TEST EQUIPMENT

A. Air compressor.

B. Air supply line.

C. Shut-off valves.

D. Pressure regulator.

E. Pressure relief valve.

F. Stop watch.

G. Plugs.

H. Pressure gauge, calibrated to 0.1 psi.

2.2 DEFLECTION TEST EQUIPMENT

A. Go, No-Go mandrels.

B. Pull/retrieval ropes.

2.3 VACUUM TESTING EQUIPMENT

A. Vacuum pump.

B. Vacuum line.

C. Vacuum tester base with compression band seal and outlet port.

D. Shut-off valve.

E. Stop watch.

F. Plugs.

G. Vacuum gauge, calibrated to 0.1 inch Hg

2.4 EXFILTRATION TEST EQUIPMENT

A. Plugs.

B. Pump.

C. Measuring device.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify manholes and piping are ready for testing.

C. Verify trenches are backfilled.

D. Verify pressure piping concrete reaction support blocking or mechanical restraint system is installed.

3.2 PIPING PREPARATION

A. Lamping:
   1. Lamp gravity piping after flushing and cleaning.
   2. Perform lamping operation by shining light at one end of each pipe section between manholes; observe light at other end; reject pipe not installed with uniform line and grade; remove and reinstall rejected pipe sections; re-clean and lamp until pipe section achieves uniform line and grade.

B. Plug outlets, wye-branches and laterals; brace plugs to resist test pressures.

3.3 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Testing Gravity Sewer Piping:
   1. Low-pressure Air Test:
      a. Test each section of gravity sewer piping between manholes.
      b. Introduce air pressure slowly to approximately 4 psig.
         1) Determine ground water elevation above spring line of pipe for every foot of ground water above spring line of pipe, increase starting air test pressure by 0.43 psig; do not increase pressure above 10 psig.
      c. Allow pressure to stabilize for at least five minutes. Adjust pressure to 3.5 psig or increased test pressure as determined above when ground water is present. Start test.
      d. Test:
         1) Determine test duration for sewer section with single pipe size from the following table. Do not make allowance for laterals.

Nominal Pipe Size, inches	Minimum Test Time, min/ 100 feet
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4

         2) Record drop in pressure during test period; when air pressure has dropped more than 1.0 psig during test period, piping has failed; when 1.0 psig air pressure drop has not occurred during test period, discontinue test and piping is accepted.

3) When piping fails, determine source of air leakage, make corrections and retest; test section in incremental stages until leaks are isolated; after leaks are repaired, retest entire section between manholes.

C. Deflection Testing of Plastic Sewer Pipe:
1. Perform vertical ring deflection testing on PVC sewer piping, after backfilling has been in place for at least 30 days but not longer than 12 months.
2. Allowable maximum deflection for installed plastic sewer pipe limited to 5 percent of original vertical internal diameter.
3. Perform deflection testing using properly sized rigid ball or 'Go, No-Go' mandrel.
4. Furnish rigid ball or mandrel with diameter not less than 95 percent of base or average inside diameter of pipe as determined by ASTM standard to which pipe is manufactured. Measure pipe in compliance with ASTM D2122.
5. Perform test without mechanical pulling devices.
6. Locate, excavate, replace and retest pipe exceeding allowable deflection.

D. Testing Manholes:
1. General:
a. Perform vacuum test prior to backfilling to assist in locating leaks. Make joint repairs on both outside and inside of joint to ensure permanent seal. Test manholes with manhole frame set in place. Perform exfiltration test after backfill has been placed.
b. Vacuum testing may be performed in lieu of exfiltration test when the manhole is in the presence of groundwater.
2. Vacuum Test:
a. Perform in accordance with ASTM C1244 and as follows:
b. Plug pipe openings; securely brace plugs and pipe.
c. Inflate compression band to effect seal between vacuum base and structure; connect vacuum pump to outlet port with valve open; draw vacuum to 10 inches of Hg; close valve; start test.
d. Test:
1) Determine test duration for manhole from the following table:

	Manhole Diameter (in)		
	48	60	72
Depth (ft)	Time (seconds)		
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81

2) Record vacuum drop during test period; when vacuum drop is greater than 1 inch of Hg during test period, repair and retest

manhole; when vacuum drop of 1 inch of Hg does not occur during test period, discontinue test and accept manhole.

3) When vacuum test fails to meet 1 inch Hg drop in specified time after repair, repair and retest manhole.

3. Exfiltration Test:
   a. Plug pipes in manhole; remove water in manhole; observe plugs over period of not less than 2 hours to ensure there is no leakage into manhole. Perform exfiltration test after backfill has been placed and compacted around manhole.
   b. Determine ground water level outside manhole.
   c. Fill manhole with water to within 4 inches of top of cover frame. Prior to test, allow manhole to soak from minimum of 4 hours to maximum of 72 hours; after soak period, adjust water level inside manhole to within 4 inches of top of cover frame.
   d. Measure water level from top of manhole frame; at end of 4 hour test period, again measure water level from top of manhole frame; compute drop in water level during test period.
   e. Manhole exfiltration test is considered satisfactory when drop in water level is less than values listed in table below:

	Manhole Diameter (in)		
	48	60	72
Depth (ft)	Allowable Leakage (in)		
4	0.11	0.14	0.17
6	0.17	0.21	0.26
8	0.23	0.29	0.35
10	0.28	0.35	0.42
12	0.34	0.43	0.51
14	0.40	0.50	0.60
16	0.45	0.56	0.68
18	0.51	0.64	0.77
20	0.57	0.71	0.86

4. When unsatisfactory test results are achieved, repair manhole and retest until result meets criteria; repair visible leaks regardless of quantity of leakage.

END OF SECTION

SECTION 33 01 33

MANHOLE REHABILITATION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes
   1. This section includes materials, testing, and installation of corrosion barrier geopolymer mortar for concrete structures.

B. System Description
   1. 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.

1.2 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

1.3 SUBMITTALS

A. Pre-Construction Submittals:
   1. Furnish the following Qualifications Statement submittal:
      a. Submit manhole rehabilitation company history stating years in service
      b. Submit evidence of factory authorization or licensing by Manufacturer of manhole rehabilitation system to install product.
      c. Submit documentation of employees' cognizance and ability to comply with all Federal and State OSHA regulations regarding confined space entry.
   2. Furnish the following submittals.
      a. Submit Manufacturer's product catalog data including physical properties.

b. Submit application instruction requirements.
c. Submit coating system and application certification per certificate of compliance requirements.
d. Submit material samples.
e. Submit qualifications of applicator(s).

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 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 PREPARATION:

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 Owner.
   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 rapid 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.
      a. For new connection rechanneling, chip out and remove existing channel as necessary to make new connection and grout new channel.

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 Owner. Complete additional spark testing after all repairs have been completed, reinspected and approved.
   5. Vacuum Testing – See Section 33 01 32 Sewer and Manhole Testing.
   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 05 07.21

SHAFT CONSTRUCTION

PART 1 GENERAL

1.1 REQUIREMENTS

A. This section specifies the requirements for excavating, sheeting, and shoring required to construct jacking, receiving, and rescue shafts for tunneling as specified in Section 33 05 07.22 Horizontal Auger Boring.

B. Assume sole responsibility for designing, locating, and sizing the shaft excavations to accommodate the construction method, all existing utilities, all permanent structures, installation of carrier pipe(s), and conform to right-of-way limitations.

C. Relocate, support, or bypass all utilities required in the performance of the Work.

D. Other excavations as specified in Section 33 05 07.22 Horizontal Auger Boring.

E. Furnish all designs, tools, equipment, materials, and supplies, and perform all labor required to complete the Work as indicated on the Approved Plans and specified herein.

F. Shafts located within Caltrans (CT) ROW are subject to CT review, acceptance, and inspection. This includes associated work required to complete the work.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 01 15 00 Measurement and Payment.

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards effective at time of bid:
   1. ASTM A36 - Specification for Carbon Structural Steel
   2. ASTM A328 - Specification for Steel Sheet Piling
   3. ASTM A500 - Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
   4. ASTM A572 - Specification for High-Strength Low-Alloy Columbian-Vanadium Structural Steel
   5. ASTM A992 - Specification for Structural Steel Shapes
   6. ASTM C33 - Specification for Concrete Aggregates
   7. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
   8. ASTM C109 - Compressive Strength of Hydraulic Cement Mortars (Using 2- inch or [50-mm] Cube Specimens)
   9. ASTM C150 - Specification for Portland Cement
   10. ASTM C618 - Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
   11. AWS D1.1/D1.1M - Structural Welding Code - Steel

12. NFPA 241 – Standard for Safeguarding Construction, Alteration, and Demolition Operations
13. NSF/ANSI Standard 060 - Drinking Water Treatment Chemicals – Health Effects

B. State Regulatory Codes to be current:
   1. California Code of Regulations (CCR), Title 8, Tunnel Safety Orders
   2. CCR, Title 8, Construction Safety Orders, Section 1509 “Injury and Illness Prevention Program
   3. Caltrans (CT) Manual for Encroachment Permits on California State Highways
   4. CT Trenching and Shoring Manual

1.4 DEFINITIONS

A. As defined in Section 33 05 07.22 Horizontal Auger Boring.

1.5 PROJECT SITE CONDITIONS

A. As stated in Section 33 05 07.22 Horizontal Auger Boring.

1.6 DESIGN REQUIREMENTS

A. Design shafts to conform to right-of-way limitations as shown on the Plans.

B. Design temporary shoring system to provide a minimum factor of safety of 2.0 against sliding and 1.5 against bottom heave. Design shaft sides and bottom sufficient to support Contractor’s construction equipment and means and methods.

C. Coordinate the shaft design and construction submittals with the referenced Specifications. Include, and not limited to maximum allowable jacking forces, loads induced by ground pre-treatment, and traffic loads.

D. Demonstrate casing joint length, carrier pipe joint length, and HAB construction method are compatible with jacking shaft length.

E. Design excavation support systems compatible with the subsurface ground conditions identified in Section 33 05 07.22 Horizontal Auger Boring.

F. Design, provide, and operate a dewatering system in compliance with Section 31 23 19 Dewatering, maintaining groundwater at least 4.0 feet below the shaft excavation.

G. Drill ground to minimize vibration and allow for shoring installation and shaft excavation.

H. Upon completion of shaft excavation install sump pump(s) to remove all incidental, construction, and storm water. Water shall be treated and disposed of in conformance with Section 31 23 19 Dewatering and as permitted.

1.7 PERFORMANCE REQUIREMENTS

A. Design and construct the shaft using materials that limit water inflow to less than 2.0 gallons per minute from all sources before and during tunneling operations except as specifically specified otherwise. Limit groundwater inflow before HAB commences.

B. Sump pumping shall not be used as a method of dewatering.

1.8 QUALITY ASSURANCE

A. Contractor's Engineer: Excavation support systems shall be designed by a Civil or Structural engineer registered in the State of California who has a minimum of five (5) years of experience in shaft designs including shafts of similar size and in similar ground conditions as measured by ground type, N values, and depth of groundwater.

B. Surveyor: Surveying shall be performed by a California licensed surveyor who has surveyed a minimum of five (5) tunnels in the last five (5) years and transferred line and grade within a shaft.

C. Initial Survey: Prior to beginning demolition or excavation, perform a survey in accordance with Section 31 09 13 Geotechnical Instrumentation and Monitoring that identifies and locates facilities within 50 feet of the shaft excavation.

D. Work Plan: Loads, materials, and equipment to be used, the method and sequence and timing of installation, and site restoration plan.

E. Field Inspection Plan: for field verification of the shaft design that at a minimum, measures and records settlement, bottom heave, groundwater elevation, and shaft member deflections daily in accordance with accepted submittals.

F. Installation Logs: include the following as applicable:
   1. Shoring element number, location, length, plumbness, and bearing material.
   2. Concrete, grout, and steel properties.
   3. Dates for excavation completed and concrete placed.
   4. Diameter of top and bottom of shaft.
   5. Elevations of top of ground, top of shoring elements, and bottom of shoring elements.
   6. Results of all tests and observations.

G. Cutter Soil Mixing (CSM), jet grout, and other soil replacement methods: Construct in-the-field test panels to validate the design assumptions and to determine grout injection rates. Take and test the compressive strength of concrete cast into the panels.

1.9 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00 Submittal Procedures and as specified herein.

B. Shaft submittals shall be coordinated with submittals from all sections referenced above, assembled, and submitted as a single, comprehensive submittal.

C. Where calculations are required to be submitted, they shall be signed and sealed by a Professional Civil Engineer registered in the State of California. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information including page number(s).

D. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

E. Qualifying submittals:
   1. Qualifications of Contractor's Engineer and Surveyor.
   2. Product Data:
      a. Materials specified in Part 2.
      b. Material Safety Data Sheets.
      c. Manufacturer's mixing and handling requirements, personal safety equipment, first aid measures, and methods for proper storage and disposal of waste materials, including containers.
   3. Certifications:
      a. Products described herein including Certificates of Compliance from the manufacturer.
      b. Personnel trained in handling, mixing, injection, and disposal of materials.
   4. Work Plans:
      a. Specific to the design.
      b. Specific to the selected materials.
   5. Contingency Plans
      a. Ground conditions are different than those anticipated.
      b. Groundwater conditions are different than those anticipated.
      c. Shoring moves more than allowed in shaft design.
      d. Members are out of design tolerance, i.e. out of vertical.
   6. Field Inspection Plans as direct by the design.

F. Pre-Construction submittals:
   1. Calculations, including jacking force impacts and penetrations:
      a. Bottom heave.
      b. Lateral support.
      c. Provide design calculations used to size shoring members, determinable material specifications and joint and connection details. Include stability evaluations at each stage of excavation, backfill and shoring removal, and tunnel penetration. Indicate calculated deflections for allowable load limits.
   2. Shop Drawings: signed and stamped, shall include:
      a. Existing Site Plan: for each shaft location indicating utilities, structures, and vegetation that are to be protected in place.
      b. Site Plan: for each shaft indicating the location, excavation dimensions, site grading, and site development details for the excavation and work areas, and the proposed limits of disturbance. Include details of types, amounts, and positioning of materials and equipment required at each location. Show overhead utilities and other overhead conflicts.
      c. Methods, procedures, and sequence for preloading and installing bracing.
      d. Foundation details for all permanent structures.
   3. Shop drawings for crane positioning at each shaft location:
      a. Drawings showing different crane positions to be used that demonstrate safe swing in and around existing aerial utilities.
      b. Shoring construction and removal sequence in conjunction with backfill placement.
   4. Sample daily log forms.
   5. Concrete design mix and compressive strength test results.

G. Construction Submittals:
   1. Shaft field inspection data on the same date as taken and interpretation by noon the following workday.
   2. Daily Installation Logs.
   3. Concrete test results from a certified laboratory.
   4. Field test results for each concrete mix.
   5. Field test results for each field test panel.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide all shoring materials in accordance with accepted submittals.

B. Structural Steel, as a minimum:
   1. HP shapes: ASTM A 572, Gr. 50.
   2. Channels, angles, and plates: ASTM A 36
   3. Wide flange: ASTM A 992.
   4. Hollow steel section: ASTM A 500.
   5. Sheet piles: ASTM A 328.

C. Corrugated Metal Pipe (CMP): Zinc Coated.

D. Concrete materials:
   1. Portland Cement: ASTM C 150, Type I or II unless otherwise required in the design.
   2. Fly Ash/Slag unless otherwise required in the design:
      a. Fly Ash Admixture: ASTM C 618, Class C or F
      b. Ground Granulated Blast Furnace Slag: ASTM C 33, uniformly graded, ¾ in maximum aggregate size.
   3. Normal Weight Aggregate: ASTM C 33, uniformly graded, ¾ in maximum aggregate size.
   4. Concrete strength per ASTM C39 or C109.

E. Water: Potable.

F. Bentonite: High yield sodium bentonite; NSF/ANSI Standard 060 compliant.

G. Admixtures: Shall be accepted by the Owner. If commercially available and acceptable to the product manufacturer all polymers, and additives, other than soda ash, shall be NSF/ANSI Standard 060 compliant.

H. Welding unless otherwise required in the design: AWS D1.1/D1.1M.

I. Corrugated Metal Pipe/Casing unless otherwise required in the design:
   1. ASTM A36.
   2. Zinc coating.
   3. Minimum of ¼ inch thick.

PART 3 EXECUTION

3.1 GENERAL

A. Perform all work in accordance with accepted submittals.

B. Provide Owner with access to the shaft.

C. Provide the Owner with access to review and copy associated records.

D. Upon Owner's request, allow and assist in the collection of ground and spoils samples.

E. Maintain a copy of the Approved Plans and accepted submittals at a location acceptable to and accessible to Owner.

F. Before commencing with any excavation perform preconstruction activities in conformance with Section 31 23 16 Excavation.

G. Install all instrumentation in accordance with Section 31 09 13 Geotechnical Instrumentation and Monitoring.

H. Prior to commencing shaft excavation, comply with:
   1. CCR, Title 8, Tunnel Safety Orders;
   2. CT Manual for Encroachment Permits on California State Highways; and
   3. CT Trenching and Shoring Manual.

I. Dispose of all excess earthen materials in conformance with Section 31 05 13 Soils for Earthwork.

J. Treat and legally dispose of all water in accordance with Section 31 23 19 Dewatering.

3.2 SHAFT SIZE AND LOCATION

A. Proposed shaft locations are as shown on the Approved Plans.

B. Shaft sizes are as determined by the Contractor and accepted by Owner.

C. Proposed shafts at locations other than where shown on the Approved Plans shall comply with the following conditions:
   1. Alternate, rescue, or additional shaft locations shall be defined as alternate shaft locations proposed by the Contractor.
   2. Alternate shaft locations shall be acceptable to the Owner and not be:
      a. Located in cross streets,
      b. Block a sole entrance or exit to a property, or
      c. Relocated within Caltrans ROW without Caltrans' written approval.

D. Drill ground as needed to minimize impact and allow proper placement of shaft members.

E. Obtain and provide all approvals, right of entry, and permits for alternate shaft locations to the Owner.

F. Contractor's Surveyor shall stake locations of the shaft elements and guide frames as required by the Contractor's design.

3.3 EXCAVATION

A. Locate all utilities before commencing excavation.

B. All earthwork shall be in accordance with Section 31 05 13 Soils for Earthwork.

C. Fill and compact with backfill in accordance with Section 31 23 17 Trenching and 31 05 16 Aggregates for Earthwork.

D. Confirm in-situ soil suitability at bottom of shaft for HAB equipment. If unstable subgrade conditions are encountered, or if the subgrade becomes destabilized by the introduction of water and disturbance, overexcavate an additional 18 to 24 inches and replace the material with clean ¾-inch crushed rock placed over a woven stabilization fabric, such as Mirafi 600x or approved equal.

3.4 SHAFT CONSTRUCTION: GENERAL

A. Protect existing structures, utilities, vegetation, and facilities before commencing shaft excavation.

B. Construct instrumentation as shown on the Plans and as specified in Section 31 09 13 Geotechnical Instrumentation and Monitoring before shaft excavation.

C. Drill ground as needed to minimize impact and allow proper placement of shaft members.

D. If settlement or deflections of supports or shaft bottom indicate the support system requires modification, the Contractor's Engineer shall redesign and resubmit revised shop drawings and design calculations.

E. Construct jacking shafts with the shoring flush with the existing ground surface or extending not more than 4.0 feet above the existing ground surface.

F. Rescue Shaft Construction: Vertical shaft boring with a CMP liner is an acceptable construction method. Construct rescue shaft in front of the HAB. Push the HAB into the rescue shaft.

3.5 SHAFT CONSTRUCTION: INTERNAL BRACING SUPPORT SYSTEM

A. Construct the internal bracing support system using walers, struts, and/or shores as required by the design accepted in the Contractor's submittals.

B. Construct and maintain all bracing support members in intimate contact with other support members and with the ground.

C. Preload bracing members by jacking struts to no more than 50 percent of the design load as provided in the accepted submittals.

D. Preload bracing members in accordance with methods, procedures, and sequence as described on the shop drawings.

E. Use procedures that produce uniform loading of bracing members without eccentricities or over-stressing and distortion of members or system.

3.6 SHAFT CONSTRUCTION METHODS

The following are selected methods that meet the design and performance requirements specified herein. Choose one of the following methods or another method that meets the requirements specified herein.

A. Corrugated Metal Pipe (CMP) in Drilled Shaft.
   1. Drill the hole within the design tolerances submitted for vertical alignment, diameter, and depth. Make drilled hole sufficient size to allow placing of CMP and backfilling the annular space without damaging the CMP.
   2. Provide CMP true and round within design tolerances and of sufficient length to line entire hole. Construct CMP within design tolerances of plumb as stated in the accepted submittal.
   3. Backfill the annular space with grout of sufficient strength and flowability to provide intimate contact with the ground and CMP. Provide backfill grout in accordance with the accepted submittals.
   4. Design and construct the shaft bottom as an integral part of the entire shaft.
   5. Remove the first six feet of CMP below the ground surface during shaft backfill operations.

B. Interlocking Sheet Piles
   1. Design and construct the shaft bottom as an integral part of the entire shaft.
   2. Remove all steel subsurface ground support materials, except for those lying directly below the installed jacked pipe.
   3. Piles shall be guided and held in position by temporary gates with each pile properly interlocked with its neighbor.
   4. Where shaft extends into rock, extend sheet piles to depth required by predrilling into rock.

C. Beam and Plate and/or Slide Rail System
   1. Install beams or rails before starting excavation. Install beams or rails by pre-drilling method and sufficiently keyed into bottom of excavation. Beams and rails are referred to beams hereafter.
   2. Use concrete/grout to encase the beams in the pre-drilled holes. If casing is used, extract casing as concrete is poured while maintaining minimum 5 feet head of concrete within the casing. Monitor volume of concrete to ensure voids do not result during extraction of casing. Drilling, placement of concrete, and installing and removing casing is in accordance with Section 49 of the latest Caltrans Standard Specifications.
   3. Space beams at intervals indicated on the approved shop drawing.
   4. Accurately align exposed faces of flanges to vary not more than 2.0 inches from a horizontal line and not more than 1:120 out of vertical alignment.

5. Install tight plates or lagging within flanges of beams as excavation proceeds. All lagging is referred to as plates hereafter. Trim excavation as required to install plates. Fill voids behind plates with soil, and compact.
6. Plates can be placed on the backside of beams in the first 4 feet of the excavation to facilitate removal of the excavation support system.
7. Beams shall be installed to the minimum depths shown on approved shop drawings.

D. Cutter Soil Mixing (CSM)
1. Mix bentonite slurry with native ground using a mixing tool to construct CSM shaft walls.
2. Match cutter wheel tooling to anticipated ground conditions.
3. Excavate a guide trench for collection of surplus slurry.
4. The primary CSM segments will be installed at the spacing shown on the shop drawings. After a set of CSM segments has been installed and allowed to set for a minimum of one (1) day, then the adjacent secondary CSM segments will be installed so that sufficient overlap between the secondary and primary segments is obtained as shown on the shop drawings. Do not allow the concrete to fully set in the primary CSM segments before placing the secondary CSM segments.

E. Drilled Caissons and Secant Piles
1. Drilled Caissons: Use reinforcement consisting of welded steel cages that are placed vertically in pre-drilled holes that are backfilled with structural concrete.
2. Secant Piles: Use reinforcement consisting of structural steel beams that are placed vertically in predrilled holes that are backfilled with structural concrete.
3. The primary secant piles or drilled caissons will be installed at the spacing shown on the shop drawings. After a set of primary piles or caissons has been installed and the concrete fill allowed to set for a minimum of one (1) day, then the adjacent secondary piles or caissons will be installed so that sufficient overlap between the secondary and primary piles or caissons is obtained as shown on the shop drawings. Secondary holes shall be reinforced. Do not allow the concrete to fully set in the primary holes before placing the secondary pile or caisson.
    a. Temporary Steel Casings: Provide casings for protection of workers and inspection personnel, for prevention of cave-ins or displacement of earth walls, and for retention of groundwater when applicable, and flowing ground.
    b. Defective Casings: Do not use buckled, distorted, or otherwise damaged casings. Replace casings damaged or disturbed during construction, casings that are not mud-tight or otherwise not in accordance with Approved Plans or Specifications.
4. Excavation
    a. Excavation and construction methods shall result in minimum disturbance of surrounding material and full lateral support of secant piles or caissons by surrounding material.
    b. Excavate secant piles or drilled caissons to dimensions. Use a guide frame on the surface to layout pile or caisson locations. Maintain sidewall stability during drilling. Excavate holes for closely spaced secant piles or caissons, and those occurring in fragile strata, only after adjacent holes are filled with concrete and allowed to set. Secant pile or caisson drilling equipment shall have the minimum torque capacity and downward force capacity for the site conditions.

5. Placing Concrete
    a. Before placing concrete, the tip of each secant pile or drilled caisson shall be accepted in writing by the Owner. Each secant pile or drilled caisson shall be probed in the presence of the Owner, cleared of mud, water, loose material, and debris.
    b. Place concrete using a down pipe to direct flow of concrete. Except in the presence of water, the maximum height of concrete free fall is 4.0 feet provided the concrete does not hit the sides of the hole. Use a tremie pipe or pump, if the distance is greater than 4.0 feet or groundwater is present.
    c. Place concrete to form a monolithic cylindrical pile or caisson having full lateral support from surrounding undisturbed materials.
    d. Withdraw casing constantly after concrete has been deposited.
    e. Concrete placement in each secant pile or caisson shall be one continuous operation. If placing operations must be stopped, leave surface approximately level. If concrete has hardened, clean surface and slush with a 1-to-1 cement sand grout before placing operation is resumed.
    f. When water is present, place concrete through water by means of a watertight tremie pipe. When placing concrete under water, discharge end of tremie shall be submerged in fresh concrete and shaft of tremie maintained full of concrete to a point above water level. Increase cement content of concrete required to be placed in water by one sack per cubic yard of concrete.

3.7 QUALITY CONTROL, TESTS, AND INSPECTIONS

A. Provide quality control, testing, and inspection as required in the accepted submittals.

3.8 REMOVAL OF SUPPORT SYSTEM/SITE RESTORATION

A. After all equipment and excavated materials for the tunneling operations have been removed from the jacking shaft, prepare the bottom of the shaft in the same manner as a pipe foundation and remove all loose and disturbed materials below pipe grade to undisturbed ground and re-compact the material in accordance with Section 31 05 16 Aggregates for Earthwork and Section 31 23 17 Trenching.

B. Remove excavation support to a minimum of 4.0 feet below grade during shaft backfill operations. Perform removal in a manner that avoids ground settlement and damage to adjacent facilities.

C. Site restoration shall be completed at all shaft locations restoring site to its original pre-construction condition.

END OF SECTION

SECTION 33 05 07.22

HORIZONTAL AUGER BORING

PART 1 GENERAL

1.1 REQUIREMENTS

A. This section specifies minimum design and performance requirements for the construction of a steel casing pipe (casing) using horizontal auger boring (HAB). The casing is to have a gravity operated raw sewage pipeline inserted to design line and grade inside the casing.

B. No excavation deeper than four (4.0) feet shall be permitted within 100 feet of the jacking shaft and tunnel alignment until after tunneling operations have been successfully completed, except potholing for utilities conflicting with the shaft or tunnel alignment, relocation of utilities conflicting with the shafts or tunnel, and the installation of instrumentation as specified in Section 33 05 07.21. Excavations projecting away from the tunnel and behind the receiving shaft are also exempt from this requirement.

C. Furnish all designs, tools, equipment, materials, and supplies, and perform all labor required to complete the Work as indicated on the Approved Plans and specified herein.

D. Select, furnish, and maintain the HAB and ancillary equipment in proper and safe working order.

E. Install casing to the line and grade as noted on the Approved Plans and the tolerances noted herein.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Comply and coordinate with the following Specifications:
1. Section 01 33 00 Submittal Procedures
2. Section 31 23 19 Dewatering
3. Section 31 05 13 Soils for Earthwork
4. Section 31 23 17 Trenching
5. Section 31 09 13 Geotechnical Instrumentation and Monitoring
6. Section 33 05 07.21 Shaft Construction
7. Section 33 05 07.23 Carrier Pipe Installation into Casing
8. Section 33 05 07.24 Jacked Steel Casing
9. Section 33 05 08 Backfill Grout

B. Comply with the following industry standards effective at time of bid:
1. NFPA 241 – Standard for Safeguarding Construction, Alteration, and Demolition Operations
2. NSF/ANSI Standard 060 – Drinking Water Treatment Chemicals – Health Effects
3. Caltrans Standard Specifications).

C. State Regulatory Codes effective through project completion:
   1. California Code of Regulations (CCR), Title 8, Tunnel Safety Orders
   2. CCR, Title 8, Construction Safety Orders, Section 1509 “Injury and Illness Prevention Program
   3. Caltrans (CT) Manual for Encroachment Permits on California State Highways
   4. CT Trenching and Shoring Manual

1.3 DEFINITIONS:

A. ADVANCE RATE: Forward progress over a given period of time; includes penetration rate, makeup time, downtime, and idle time; typically measured in feet or meters per hour or shift.

B. ANNULAR SPACE: The theoretical volume between the gauge cut and the outside radius of the jacking pipe times the length of the installation, equal to annulus x length of tunnel.

C. ANNULAR THICKNESS: The radial distance between the excavated radius created by the gauge cutter and the outside radius of the jacking pipe. The radial distance is equal to the overcut (gauge cut) plus the shield cut.

D. ANNULUS: The theoretical area between the gauge cut and the pipe outside diameter (OD) equal to (π x (gauge cut OD^2 - pipe OD^2)/4). It is the combined area created by the overcut and the shield cut.

E. BACKFILL GROUTING: Grout injected into void space between the carrier pipe and casing after the carrier pipe is in-place.

F. BOULDER: Per ASTM D653, a rock fragment, usually rounded by weathering or abrasion, with a dimension of 12 in. (305 mm) or more.

G. BURIED OBJECTS: Items in the ground that can affect HAB advancement and line and grade control. Buried objects that prevent continued advancement along the design path, which includes tolerances, are obstructions.

H. CARRIER PIPE: For this project, a PVC or FPVC sewer pipe for use in a sewer gravity conveyance system.

I. CASING: For this project, a steel casing pipe jacked using HAB equipment in a two-pass system that supports a bore. The casing is not a carrier pipe.

J. CEMENTED SOILS: Soils in which the particles are held together by a naturally occurring or synthetic chemical agent that changes the soils’ physical and mechanical properties.

K. COBBLE: Per ASTM D653, a rock fragment, usually rounded or semi rounded, with dimensions between 3 and 12 in. (75 and 305 mm).

L. COHESIONLESS SOILS (NON-COHESIVE SOILS): Earth materials containing less than 20 percent soil particles passing the No. #200 sieve. Any free-running soil, such as sand or gravel, whose strength depends on friction between particles.

M. COHESIVE SOILS: Earth materials containing 20 percent or more soil particles passing the No. #200 sieve.

N. CONTACT GROUTING: Grouting injected into the theoretical void space between the jacking pipe and the ground after the casing is installed.

O. CONTAMINATED PLUME: The underground trace of an environmental pollutant.

P. CONTRACT DOCUMENTS: Documents prepared by the Engineer of Record for design, bidding, and for awarding a project; they can include bid forms, general conditions, special conditions, technical specifications, approved plans, permits, and reference boring logs.

Q. CONTROLS: Part of the HAB system that allows synchronized excavation, removal of spoils, and jacking of pipe to balance forward movement with excavation and manage ground settlement and heave.

R. CROSSING: Pipeline installation in which the primary purpose is to provide one or more passages beneath a waterway, road, or other surface obstruction.

S. CROWN: The highest point of the pipe or tunnel.

T. CUT AND COVER: See open cut.

U. CUTABILITY: The capacity of rock to be spalled, ripped, chipped, and broken into smaller pieces to allow the advance of the HAB. Key properties affecting cutability include the frequency of discontinuities, unconfined compressive strength, tensile strength, hardness, and abrasiveness of the rock.

V. CUTTER chamber access: See face access.

W. CUTTER WHEEL: Any rotating tool or system of tools on a common support used to excavate at the face of a bore.

X. CUTTINGS: See spoils.

Y. DELAY TIME: Lost time associated with the Engineer issues.

Z. DEWATERING: The act of removing groundwater or lowering the groundwater elevation, using a system of wells and pumps. Sump pumping is not an acceptable form of dewatering.

AA. DIFFERENTIAL CUT: The spiral, screw like pattern created on the excavated surface as the gauge cutter is advanced while rotating around the bored periphery of the cutter wheel.

BB. DIRECT-JACKED PIPE: Pipe installed in the ground and serves as the casing and carrier pipe.

CC. DOWNTIME: Time lost when the HAB is unable to operate; typically associated with equipment failure.

DD. DRILLING FLUID: Water that may contain additives, including bentonite, polymers, soda ash, surfactants, or other materials, to enhance stability and excavatability. If the drilling fluid contains additives and is design to have specific properties, it is an engineered drilling fluid, whether specified by the engineer or selected by the Contractor. Additives may increase the effectiveness of the drilling fluid, change physical properties, or reduce adhesion of the spoils (cuttings). Two examples of drilling fluids are:
    1. Slurry - Closed-loop system for transporting spoils and circulating fluid for counterbalancing earth and groundwater pressures during microtunneling.
    2. Lubrication – Reducing skin friction by filling the annular space.

EE. DRIVE: Designation of the pipe installed from a jacking shaft to a reception shaft.

FF. DRIVE SHAFT: See jacking shaft.

GG. EFFECTIVE STRESSES: In a saturated mass of soil or rock, the total stress P minus pore water pressure, Uw.

HH. EMERGENCY RECOVERY SHAFT: See rescue shaft.

II. ENGINEERED DRILLING FLUID: See drilling fluid.

JJ. ENTRANCE SEAL: See launch seal.

KK. ENTRY RING: See launch seal.

LL. EXIT SEAL: Same as a launch seal except for the retrieval of the machine at the reception shaft. Used in high groundwater and unstable soils to prevent loss of ground.

MM. EXIT SHAFT: See reception shaft.

NN. EYE: The opening in the shaft wall through which the casing is jacked into the ground.

OO. FACE: The location where excavation is taking place.

PP. FACTOR OF SAFETY: The ratio of the structural capacity of a system to expected or actual loads on the system.

QQ. FILTER CAKE: A thin layer of clay or polymer from the slurry at the face and perimeter of the formation being excavated. The filter cake is formed through filtrate loss.

RR. FILTRATE: A liquid that has passed through a filter.

SS. FINES: Portion of a soil finer than a No. 200 (75 mm) US standard sieve.

TT. FRAC-OUT: See inadvertent return and hydrofracture.

UU. GAUGE CUT: The outermost projection of the excavation, measured as a diameter. The gauge cut is subject to cutter wear and to the differential cut.

VV. GAUGE CUTTER: The cutter that creates the gauge cut and is subject to wear.

WW. GEL: Per ASTM D653, the condition of a liquid that has begun to exhibit measurable shear strength.

XX. GEL TIME: The measured time interval between the point when the slurry mix is in a fluid state and the point when it begins to form a gel.

YY. GRAVEL: Per ASTM D653, rounded or semi rounded particles of rock that will pass a 3-in. (76.2-mm) sieve and retained on a No. #4 (4.75-mm) US standard sieve.

ZZ. GROUND COVER: Distance between the ground surface and the crown of the pipe.

AAA. GROUNDWATER: All subsurface water, as distinct from water on the surface.

BBB. GROUTING: The process of filling voids or of modifying or /improving ground conditions. Grouting materials may be cementitious, chemical, or composed of other mixtures.

CCC. GUIDANCE SYSTEM: System that locates the actual position of the HAB relative to the laser or other device. The laser or other device is set to the design line and grade.

DDD. GUIDED BORING METHOD: Another term for the pilot tube method, in which an HAB is used behind a pilot tube guidance and steering system.

EEE. HEAVE: Measurable upward movement of the ground or structure as the result of the excavation process.

FFF. HORIZONTAL AUGER BORING (HAB): A technique for forming a bore from a jacking or drive shaft to a receiving shaft by means of a rotating auger with cutting tools. The casing is jacked forward in a cyclic process while the auger is rotated. Spoils are transported to the drive shaft by a helically wound auger flights rotating in the steel casing. The equipment may have limited guidance and steering capability.

GGG. HQ: A diamond core wire line tube drill bit size where the hole diameter is 96 mm and the core diameter is 63.5 mm.

HHH. HYDROFRACTURE: A special form of inadvertent return in which drilling fluid reaches the surface or waterway. Also called a frac-out.

III. IDLE TIME: Lost time when the HAB is not in operation; not including make-up time or downtime.

JJJ. BOINADVERTENT RETURN: The loss of drilling fluid, including slurry and lubrication, from the slurry or lubrication system. A special form of inadvertent return, where the fluid exceeds the strength and confining pressure of the ground and reaches the surface or waterway, is a hydrofracture or frac-out.

KKK. INCLINOMETER:

1. A geotechnical instrument used to measure horizontal deflection transverse to an installed vertical pipe casing by passing a probe through a casing (via two sets of grooves in the casing).
2. An instrument used within the HAB to measure pitch and roll.

LLL. INJURY AND ILLNESS PREVENTION PROGRAM (IIPP): Health and safety plan in accordance with CCR, Title 8, Construction Safety Orders, Section 1509 “Injury and Illness Prevention Program.”

MMM. INVERT: The lowest point of the pipe, tunnel, or shaft.

NNN. JACKING FORCE: The total force required to overcome the face pressure component and the frictional resistance component along the pipe so as to allow forward movement of the HAB and the trailing pipe string.

OOO. JACKING FRAME: A structural component that houses the hydraulic cylinders used to propel the HAB machine and pipeline. The jacking frame cradles the jacking pipes and serves to distribute the thrust load to the pipeline and the reaction load to the shaft wall or thrust block or shaft invert.

PPP. JACKING LOADS: See jacking force.

QQQ. JACKING PIPES: Pipes designed to be installed using pipe jacking techniques.

RRR. JACKING SHAFT: Excavation from which trenchless technology equipment is launched for the installation of a pipeline. The jacking shaft may incorporate a thrust wall to spread reaction loads to the ground and an entry ring to control inflows of groundwater and soil at the portal.

SSS. JACKING SHIELD: A fabricated steel cylinder from within which the excavation is carried out either by hand or machine. An articulated steering section and steering jacks are incorporated into the shield to allow it to be adjusted to control line and grade. The term is associated with traditional tunneling.

TTT. K-RAIL: A modular concrete or plastic barrier used employed to separate lanes of traffic.

UUU. LASER: A device commonly incorporated into the guidance system and used to track alignment and grade during the tunneling or jacking operation.

VVV. LAUNCH SEAL: A mechanical seal, usually consisting of a rubber flange that mounted to the wall of the jacking shaft. The flange seal is distended as the HAB and trailing pipe string pass through the seal into the ground. The seal prevents or minimizes the flow of groundwater, soils, slurry, or lubrication into the shaft during tunneling operations.

WWW. LUBRICATION: The act of injecting an engineered drilling fluid, normally bentonite and/or polymers, designed to reduce the skin friction and jacking forces on the jacking pipe during installation. The drilling fluid fills the annular space.

XXX. MAKEUP -UP TIME: The time spent to add a pipe segment and make connections.

YYY. MARSH FUNNEL VISCOSITY: A measure of the flow rate of a fluid through a calibrated funnel. A Marsh funnel measures drilling fluid and slurry viscosity, in seconds per quart (sec/qt) of fluid. The Marsh funnel viscosity of water is 26 seconds per quart.

ZZZ. MAXIMUM ALLOWABLE JACKING FORCE: The largest jacking force that can be applied to the jacked pipe, allowing for an appropriate factor of safety.

AAAA. MAXIMUM ANTICIPATED JACKING FORCE: The largest anticipated jacking force required to advance jacking pipe and machine along a drive.

BBBB. MIXED FACE: An interface within the excavated tunnel zone between two geological units that have a significant contrast in engineering properties (e.g., rock overlain by soft ground, or very soft, low-strength soil overlain or underlain by a very stiff, high-strength soil).

CCCC. MIXED GROUND: The excavated tunnel zone, without a defined interface, that contains soil and coarse fractions of gravels, cobbles, and boulders (i.e., silt with boulders). This term is not currently defined by ASTM or USCS.

DDDD. MIXED REACH: Refers to a significant change in ground type, characteristics, or behavior along the excavated tunnel between the jacking and receiving shafts. This term is not currently defined by ASTM or USCS.

EEEE. MUCK: Spoils or removal of same.

FFFF. N-VALUE: The number of blows per foot required to drive a standard penetration test (SPT) soil sampler into the ground during geotechnical exploration. The N-value is often used to estimate in situ consistency of clays and silts and relative density of sands.

GGGG. NONCOHESIVE SOILS: See cohesionless soils.

HHHH. NQ: A diamond core wire line tube drill bit size where the hole diameter is 75.7 mm and the core diameter is 47.6 mm.

IIII. OBSTRUCTION: Any buried object that lies completely or partially within the cross section of the HAB and that impedes continued forward progress along the design path and within allowable tolerances.

JJJJ. ONE-PASS: A procedure by which the carrier pipe is directly jacked into the ground without a casing.

KKKK. OPEN-CUT: A method by which access is gained to the required underground level for installation, maintenance, or inspection of a pipe, conduit, or cable. The excavation is then backfilled, and the surface is reinstated.

LLLL. OPEN-FACE: Term referring to one mode of operation of a traditional TBM.

MMMM. OVERCUT: The theoretical difference between the radial measurement of the gauge cut and the shield; equal to (gauge cut OD - HAB OD)/2. Actual overcut is reduced as the gauge cutter is worn and because of the differential cut.

NNNN. OVER EXCAVATION: A process of excavating more material than the theoretical volume of the tunnel based on diameter and advanced distance. Over excavation can lead to ground settlement and the formation of voids.

OOOO. PACKER: See compression ring.

PPPP. PENETRATION RATE: Instantaneous excavation distance per time while the HAB is operating, typically measured in inches per minute or millimeters per minute.

QQQQ. PERCHED WATER: An accumulation of groundwater that is above the regional groundwater table in an unsaturated zone.

RRRR. PIERCING TOOLS: See earth piercing.

SSSS. PIEZOMETER: A specialized monitoring well that provides discrete screens and underground seals to produce a measurement of the groundwater pressure at specific intervals below ground. The groundwater pressure is measured using open standpipes or vibrating wire transducers.

TTTT. PILOT TUBE METHOD: A multistage method of accurately installing a product pipe to line and grade by use of a guided pilot tube followed by upsizing to install the product pipe. The pilot tube method does not fit within the definition of microtunneling.

UUUU. PIPE JACKING: A system of using hydraulic jacking from a drive shaft to directly install pipes behind a shield machine so that they form a continuous string in the ground.

VVVV. PIPE LUBRICANT: See lubrication. DD. PIPE STRING: The succession of joined individual pipes being used to advance and support the excavation.

WWWW. PITCH: The upward or downward angle of the HAB, measured from a theoretical horizontal plane passing through the longitudinal axis of the HAB.

XXXX. PLASTIC VISCOSITY: A measure of the internal resistance to fluid flow, expressed as the tangential shear stress in excess of the yield stress divided by the resulting rate of shear.

YYYY. PLOWING: A condition where the HAB is steered in one direction yet continues along an undesired direction.

ZZZZ. PORE WATER PRESSURE: The pressure of the groundwater held within a soil or rock: in gaps (pores) between particles.

AAAAA. POTHOLING: Small, carefully dug, non-mechanized excavation, used to locate a utility or other subsurface feature.

BBBBB. PRODUCT PIPE: See carrier pipe.

CCCCC. PUSH RING ADAPTER: Mechanical component mounted on the thrust ring to prevent the thrust ring from contacting and damaging the pipe collar.

DDDDD. RECEIVING SHAFT: See reception shaft.

EEEEE. RECEPTION SHAFT: Excavation into which the trenchless technology equipment is driven and recovered.

FFFFF. RESCUE SHAFT: An unplanned additional shaft required to remove obstacles/obstructions and/or retrieve or repair the trenchless technology equipment. The rescue shaft may need to function as a jacking shaft to complete the drive.

GGGGG. ROCK: Per ASTM D653 and ISRM, any naturally formed aggregate of mineral matter occurring in large masses or fragments.

HHHHH. ROLL: The angle of rotation about the theoretical longitudinal centerline of the HAB, measured from the 12 o'clock position.

IIIII. SEPARATION (of objects): The distance between two objects measured at their closest approach.

JJJJJ. SETTLEMENT: Measurable downward movement of the ground or of an overlying utility or other structure as the result of excavation or dewatering.

KKKKK. SETTLEMENT POINT OR MARKER: An instrument installed at ground surface or driven into the ground to monitor vertical ground deformations before, during, and after construction.

LLLLL. SHIELD CUT: The theoretical difference between the radial measurement of the shield and the jacking pipe and is equal to (shield OD - pipe OD)/2.

MMMMM. SPOILS: Earth, rock, and other materials excavated during the installation process. Also referred to as cuttings.

NNNNN. SUMP PUMP: A device placed at the base of a shaft or in a shield to collect and remove fluids incidental to the construction process and resulting from shaft leakage, and to prevent the excavation equipment from flooding.

OOOOO. SURFACE WATER: Any water encountered or collected at ground level.

PPPPP. THRUST BLOCK: An engineered structure, located between the jacking frame and the shaft wall, which distributes the jacking force developed by the hydraulic jacking frame over a large surface area to the ground behind the back wall of the shaft.

QQQQQ. THRUST RING: A fabricated ring mounted on the face of the jacking frame. The thrust ring is designed to transfer the jacking force from the jacking frame to the thrust bearing area of the pipe section being jacked.

RRRRR. TOOLING: Ground-engaging elements of the cutter wheel designed to excavate and penetrate the ground.

SSSSS. TRENCHING: See open cut.

TTTTT. TRENCHLESS TECHNOLOGY: A family of construction techniques for installing or rehabilitating underground infrastructure with minimal disruption to surface traffic, businesses, and residents. Also includes technologies for inspection, leak location, and leak detection with minimal disruption and minimal excavation from the ground surface.

UUUUU.TUNNEL ENVELOP: The vertical band within the ground where the tunnel is excavated. Includes one tunnel diameter above the crown and one tunnel diameter below the invert.

VVVVV. TWO-PASS: A procedure by which the carrier pipe is installed inside a casing.

WWWWW. UNANTICIPATED RETURN: See inadvertent return.

XXXXX. UTILITY TUNNELING: A construction method for excavating an opening beneath the ground without continuous disturbance of the ground surface. The excavation is of sufficient diameter to permit personnel access, and allow excavation, transport of spoils, and erection of a ground support system.

YYYYY. WALER: Beam used within a braced excavation as support to control wall deflections.

ZZZZZ. WATER JETTING: Process of using the internal cleansing mechanism of the cutter head, by which high-pressure water is sprayed from nozzles to help remove cohesive soils.

AAAAAA. YAW: The angle of the HAB to the left or right of a theoretical vertical plane passing through the HAB's longitudinal axis.

BBBBBB. ZONE OF INFLUENCE: Theoretical surface area impacted by settlement or heave from tunnel mining, shaft excavation, pile driving, or other construction activities.

1.4 DESIGN REQUIREMENTS

A. Provide the maximum anticipated installation loads imposed on the casing and demonstrate the anticipated loads are incorporated in the manufacturer's design subject to the Owner's Representative 's review. The minimum factor of safety shall not be less than 2.0.

B. Provide a HAB capable of advancing through the range of anticipated ground conditions along the alignment including any contractor pre-treated ground. HAB shall be capable of advancing through rock with uniaxial compressive strength (UCS) at least twice the maximum anticipated rock UCS on the project.

C. Provide a jacking system capacity that exceeds the maximum anticipated jacking force by at least 50 percent.

D. Shaft wall and ground behind shaft wall designed to support the maximum anticipated jacking force with a minimum factor of safety of 2.0. If a thrust block is used, then the thrust block shall be normal to the pipe alignment and shall be designed to support the maximum anticipated jacking force with a minimum factor of safety of 2.0.

E. Drainage facilities shall be sized to manage flows including construction water, precipitation, and anticipated inflows from the ground.

F. Provide a spoil conveyance system based on the Contractor's HAB selection and instantaneous advance rates.

G. Contact Grouting required for all drives. Provide minimum annular thickness of 0.50 inches and maximum annular thickness of 1.00 inches or justifications for variations.

H. A 42-inch steel casing is required for unguided HAB installation as shown on plan. Casing size may be reduced to minimum 30-inch steel casing if a guided system with pre-installed carrier pipe is used in lieu of unguided HAB system. Contractor to verify suitability of proposed method with existing conditions. See Project Geotechnical Report. Provide submittals for proposed installation methods per 1.7 of this Section.

1.5 PERFORMANCE REQUIREMENTS

A. Provide an HAB system capable of performing in the ground conditions as presented herein and capable of excavating in rock with an unconfined compressive strength of (UCS) 1,000 psi.

B. Prevent HAB from deviating from acceptable line and grade.

C. Ground movement on the surface directly above the tunnel shall not exceed that specified in Section 31 09 13.

D. Install the casing within the following line and grade tolerances:
   1. Carrier pipe installed to design line and grade with at least 4.0 inches of separation from the casing sidewall.
   2. Horizontal tolerance: Plus or minus 0.33 feet (4.0 inches) of theoretical centerline of the carrier pipe or increase the casing pipe size to accommodate the installation requirement.
   3. Vertical tolerance: Plus or minus 0.17 feet (2.0 inches) of the theoretical centerline of the carrier pipe or increase the casing pipe size to accommodate the installation requirement.

E. Contact Grouting is required for all casings with an outside diameter (OD) of 30.0 inches or larger. Provide minimum annular thickness of 0.50 inches and maximum annular thickness of 1.0 inches.

1.6 QUALITY ASSURANCE

A. Experience requirements outlined below shall be met at the time of bid and remain in force through completion of the Project. Work subcontracted out does not qualify as experience.

1. The Contractor performing the tunneling work shall have at least ten (10) years of experience in tunneling using HAB and shall have successfully completed five (5) tunneling projects using HAB with OD between 2 feet and 4 feet in similar ground conditions, as measured by unconfined compressive strength (UCS), with drive lengths of at least 300 feet on each project. The required experience and project history shall be that of the Contractor entity performing the work and shall not be satisfied through the experience of individual employees, officers, owners, affiliates, parent companies, subsidiaries, or predecessor firms.
2. HAB Tunneling Superintendent shall have at least five (5) years of experience supervising tunneling using HAB and shall have successfully completed at least five (5) projects in similar ground conditions, as measured by UCS, as anticipated on this Project.
3. HAB Operator shall have at least three (3) years of experience and shall have successfully completed five (5) tunneling projects using HAB with OD between 2.0 feet and 4.0 feet in similar ground conditions, as measured by UCS, as anticipated on this Project.
4. Contractor's tunnel engineer shall be a Professional Engineer registered in the State of California. Experience shall include design calculations on five (5) HAB projects within the last five (5) years.
5. Surveyor shall be a Professional Land Surveyor registered in the State of California with experience in underground surveying. Experience shall include:
    a. Five (5) tunnel projects within the last five (5) years,
    b. Transfer of points and line from the surface to below ground,
    c. Closed loop tunnel survey for line and grade, and
    d. The use of geodetic surveying if the guidance system requires such.
6. Experience records of Contractor shall include:
    a. Five (5) most recent tunneling projects
    b. All HAB projects completed for the Owner, if any
    c. All projects demonstrating the specified experience
    d. Project name
    e. Project location
    f. Project owner (Agency)
    g. Name(s) of contacts including contact information
    h. HAB size as outside casing diameter, rated horsepower (HP)
    i. Ground conditions as measured by UCS, longest drive planned, longest drive completed; total footage planned, and total footage completed.
7. The Owner's Representative will be the sole judge in determining if the prospective tunneling Contractor, HAB project superintendent, HAB operator, and surveyor meet the aforementioned project experience requirements.
8. The HAB operator shall not be replaced without the prior written acceptance of the Owner's Representative.
9. If UCS records are not available, provide a geotechnical engineer's interpretation of the combined core logs and test results.

B. Surveying:
    1. Establish control points sufficiently far from the tunnel alignment to avoid ground movement or damaged by any Work.
    2. Verify and record the line and grade of the HAB four times at equal intervals while installing the first 20 feet of casing and then again at 40 feet of installed casing.

3. During construction, verify and record the line and grade survey tunnel line and grade at 50 feet and at 100 feet of installed casing and every 100 feet thereafter (50, 100, 200) or
4. During construction, verify and record the line and grade survey tunnel line and grade if the HAB is perceived or the operator is concerned the HAB is going offline or off grade.
5. Provide a cumulative line and grade record during construction and locate previous survey points within 2.0 feet of the location previously surveyed.

C. Pipe Lay Schedule shall include:
1. Mark each pipe with consecutive numbers inside and outside immediately before jacking beginning with the number 01.
2. Underline numbers.
3. Markings shall be acceptable to the Owner's Representative.

1.7 CONTRACTOR SUBMITTALS

A. Submittals made in accordance with Section 01 33 00 and as specified herein.

B. Coordinated submittals with all relevant submittals, assembled, and submit as a single, complete, and comprehensive submittal.

C. Required calculations shall be:
1. Signed and sealed by a Professional Civil Engineer registered in the State of California
2. Clearly identify all parameters used
3. State all assumptions made in the calculations
4. Identify all sources of information including page and paragraph number and, if provided, equation number
5. All sources of information shall be widely accepted industry standard
6. Acceptable to the Owner's Representative.

D. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

E. Bidding Submittal:
1. Submit a Qualifications Statement with the Bid Proposal submittal which includes qualifications and experience records for the following, as described in Part 1.6.A in this Section:
a. Contractor performing the Work
b. HAB project superintendent
c. HAB operator
d. Tunnel Engineer
e. Surveyor

F. Pre-Construction Submittals:
1. Submit a schedule for all tunneling operations and associated works including proposed work shifts, scheduled shutdown times, and planned maintenance schedule. Coordinated tunnel schedule with overall Contract schedule.
2. Preprinted HAB data sheets and specifications or a letter from the HAB manufacturer, in English, demonstrating the selected machine is capable of

progressing through the anticipated ground conditions, including, but not limited to the UCS.

3. Shop drawings of HAB showing details of the following:
   a. Cutter wheel configuration
   b. Thrust and steering system
   c. Ancillary equipment arrangement
4. HAB manufacturer's recommendations for equipment and methods used for entering the cutter head to undertake cutter head inspection, maintenance, and cutter tool replacement.
5. Layout of launch shaft site showing all major equipment including jacking frame, control console, spoil removal system, electrical equipment, pipe storage, pipe lifting crane, etc.
6. Description of main jacking system with details, including jacking capacity, maximum instantaneous jacking speed, and operational requirements.
7. Method of intent on HAB operational parameters including, based upon ground conditions encountered:
   a. Location of auger as to casing leading edge
   b. Auger design (e.g., pitch, flight, diameter)
   c. Auger rotational speed
   d. Jacking speed
8. Thrust as a function of distance.
9. Calculations which clearly state the relationship between hydraulic jacking pressure and jacking force for the jacks.
10. Calculation of Maximum Anticipated Jacking Force.
11. Calculation of estimated bank volume per unit length of tunnel and excavated volume per unit length of tunnel.
12. Shaft design calculations and if used maximum jacking capacity of the thrust block, shaft wall, and ground behind shaft wall that will be supporting the jacking forces in compliance with Section 33 05 07.21.
13. Grade and alignment control system details including configuration, operating parameters, and monitoring requirements:
    a. Provide written confirmation from manufacturer that proposed guidance system can achieve the required line and grade tolerances for the given drive lengths.
    b. Provide methods to protect guidance system from physical disturbances.
    c. Provide methods to mitigate guidance system distortion by heat and/or humidity.
14. HAB Operating Work Plan:
    a. Complete launch procedure commencing with any modification to the designed shaft shoring system and ending with the first pipe segment jacked into the ground.
    b. Method statement for providing a mechanical entry seal.
    c. Complete exit procedure commencing with any modification to the designed shaft shoring system and ending with the first pipe segment projecting 2 feet into the receiving shaft.
15. Pipe lubrication and grout system details including capacity, operating parameters, and procedures:
    a. Description of lubrication and grout mixing equipment
    b. Procedure for lubricating the pipe during jacking operations
    c. Proposed lubrication design mix including proportions, water quality, and pH
    d. Identify pressure gauge and volumetric gauge locations

e. Theoretical calculations predicting lubrication injection pressure and volume required to avoid an inadvertent return using excessive pressure measured in psi or pumped volume measured in cubic feet or gallons per foot of casing.

16. Casing: as specified elsewhere.
    a. Calculation of Maximum Allowable Jacking Force. Include the hydraulic pressure that is required to develop the Maximum Allowable Jacking Force
    b. Lubrication port size, location, and spacing
    c. Manufacturer's written recommendations for repair of (1) casing and (2) sidewall failures based upon structural and non-structural failure requirements
17. Procedure to accurately measure the volume of excavated material per pipe segment. Include a determination of the theoretical volume of excavated material per pipe segment and allowable tolerances on this volume.
18. Procedure to accurately measure the groundwater inflow into the tunnel.
19. Provide sample of daily progress report, operator's manual log, lubrication log, and line and grade log.
20. Provide a sample of the automated record, in English, with information available for recording, variations in data acquisition frequency, and available formats for Owner's Representative to select automated recording fields. If an automated data acquisition system is not available, state "not used".
21. Submit record of the start-up inspection of all mechanical and hydraulic equipment to the Owner's Representative within one (1) workday of the completed inspection and before commencing tunneling. Include:
    a. Free-wheeling rotational auger torque with
        1) without first casing segment and auger attached
        2) with first casing segment and auger attached
    b. Thrust to dead push/retract HAB
        1) without first casing segment and auger attached
        2) with first casing segment and auger attached
    c. Line and grade.
22. Shaft and pipe ventilation system details including fan size and operating parameters.
23. Shop drawings for crane positioning. Drawings showing different crane positions that demonstrate safe swing around existing aerial utilities at each shaft location and ability to access shaft bottom.
24. Electrical system, lighting system, and onsite power generation details.
25. Water sources, handling, and disposal details.
26. Contingency Plans addressing the following:
    a. Cutter wheel becomes stalled.
    b. Water inflows exceed: 50% of allowable limits; 80% of allowable limits; 100% of allowable limits.
    c. Guidance plan with guidance system operational parameters observed, measured, and recorded to determine if the guidance system has moved or if heat/humidity/electrical/magnetic distortion is affecting the guidance.
    d. Line and grade control plan with operational parameters observed, measured, and recorded to determine if the HAB is offline and/or grade. The plan shall include a return to the design line and/or grade over the remaining portion of the drive and at a rate of not more than 1.0 inch per 25 feet at:
        1) 50% of allowable limits
        2) 80% of allowable limits

3) 100% of allowable limits

e. Jacking plan with operational parameters observed, measured, and recorded to determine if the jacking force is increasing at a rate that would exceed the Maximum Allowable Jacking Force or the jacking force is increasing at a rate causing reasonable concern for completing the drive.
f. Casing failure plan with inspection, repair, and removal plans. Repair methods shall be acceptable to the pipe manufacturer and the Owner.
g. Thrust force causes deformation or deflection when exposed to jacking loads, shows signs of structural damage, or provides insufficient capacity to advance pipe.
h. HAB cannot be advanced due to insufficient jacking capacity.
i. Shallow cover below drainage ditches:
   1) Middle Crossing, Station 22+40.
   2) South Crossing, Station 32+05.

G. Construction Submittals:
1. Notifications:
   a. All notifications are to be in writing and within one (1) workday unless otherwise specified herein.
   b. Immediately notify the Owner when water inflows exceed 50 percent of the maximum allowed. Include written description of the operational changes being made to avoid attaining the maximum allowed.
   c. Immediately notify the Owner's Representative when water inflows exceed 80 percent of the maximum allowed. Include written description of the operational changes being made to avoid attaining the maximum allowed.
   d. Immediately stop tunneling and notify the Owner's Representative when water inflows exceed 100 percent of the maximum allowed. Include written description of the operational changes being made and acceptable to the Owner's Representative before the resumption of tunneling.
   e. Immediately notify the Owner's Representative when the HAB is offline or grade by 50 percent of the maximum allowed. Include written description of the operational changes made to avoid attaining the maximum allowed.
   f. Immediately notify the Owner's Representative when the HAB is offline or grade by 80 percent of the maximum allowed. Include written description of the operational changes made to avoid attaining the maximum allowed.
   g. Immediately stop tunneling and notify the Owner's Representative when the HAB is offline or grade by 100 percent of the maximum allowed. Include written description of the operational changes made and acceptable to the Owner's Representative before the resumption of tunneling.
   h. Immediately notify the Owner's Representative upon encountering an object that impedes the forward movement and may prove to be an obstruction of the HAB.
      1) Immediately notify the Owner's Representative upon implementation of any contingency plan.
2. Provide daily progress reports with the following information for each shift:
   a. Date.
   b. Project name.
   c. Start and finish times for each crew.
   d. Station of tunnel face at start and end of each shift.
   e. Number of each pipe segment installed and length of pipe.
   f. Setting and resetting of HAB's pitch.

g. Setting, resetting, and verification of the laser's slope or guidance system.
h. Resetting or adjusting the laser and the affect to line and grade.
i. Location and estimated volume of groundwater inflows, including method of estimation.
j. Downtime, if any, and cause for downtime.

3. Provide HAB operator's manual log with three recording points of measurements for each pipe segment up to and including 10 feet long. Provide the first recording point within one foot of the start, second recording point near the midpoint, and third recording point within one foot of the end. For pipe segments longer than 10 feet add one recording point at the midpoint between the first and second recording points and add one recording point at the midpoint between the second and third recording points for a total of five recording points. For pipe segments longer than 20 feet add two additional points for each incremental addition of up to 10 feet so that there is no more than 5 feet between measurement points. For each of the recording points, record the following measurements and provide unit of measure:
   a. Printed name of operator and signature.
   b. Time of measurement.
   c. Station of pipe at the time of measurement,
   d. Position of the HAB in relation to design line and grade.
   e. Inclination and roll of the cutter head.
   f. Maximum jacking force exerted by the main jacks.
   g. Advance rate.
   h. Cutter head rotation speed and torque.
   i. Any problems encountered since last recording point.
4. The automated data recording system, if available, shall record the same operating parameters as specified for manual recording, unless otherwise specified by the Owner's Representative.
5. Provide contemporaneous log of all line and grade checks including HAB instrument and guidance system resets and adjustments. Log shall include:
   a. Date, time, station of face, and person making adjustment.
   b. Measurements immediately before adjustment.
   c. Measurements immediately after adjustment.
   d. Survey data if adjustment is performed based upon survey data.
   e. Daily verification of design slope and person making verification.
   f. Date, time, station of face, and person resetting line and grade control.
6. Provide report of cutter head inspection including the following:
   a. Date, time, station of pipe, and person conducting the inspection.
   b. Number and position of cutters changed.
   c. Reason for cutter change.
   d. Existing condition of all remaining cutters.
   e. Advance allowance before next inspection.
7. Provide all manual and automated records and logs by 9 AM the following workday. Provide hard copy and electronic copy of automated records in formats acceptable to the Owner's Representative.
8. Survey data:
   a. Survey of line and grade for HAB operations.
   b. Submit readings/measurements to the Owner's Representative on the same workday as the readings/measurements.
   c. Provide interpretation of survey results to the Owner's Representative on the following workday.

d. Provide contemporaneous written log of all laser set-ups and adjustments.
e. Provide copies of field forms used to establish all lines and grades.

H. Post-Construction Submittals:
1. Provide as-built survey of constructed tunnel.
a. Mark survey locations so results can be replicated.
b. Provide results in both tabular format and AutoCAD format acceptable to the Owner's Representative.
c. Scale to be acceptable to the Owner's Representative Engineer.
d. Survey shall confirm that carrier pipe can be installed within design tolerances.

1.8 PROJECT CONDITIONS

A. See project geotechnical report "Geotechnical Report" as described in Section 00 31 00.

1.9 PROTECTION OF EXISTING UTILITIES AND FACILITIES

A. Responsible for the care and protection of all existing utilities, facilities, and structures that may be encountered in or within 100 feet of the Work.

1.10 PERMITTING REQUIREMENTS

A. Before commencing with any tunneling Work comply with all requirements of the Tunnel Classification as issued by the State of California, Department of Industrial Relations, Division of Occupational Safety and Health.

B. When working within or under Caltrans right-of-way or easement comply with the Caltrans (CT) Encroachment Permit on California State Highways. Contractor will need to finalize Encroachment Permit before proceeding with trenchless work.

C. Contractor performing this work is required to hold a current C-34 or General Engineering Contracting License from the State of California.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide casing in accordance with Section 33 05 07.24 that is specifically manufactured for pipe jacking as specified herein.

B. Lubrication shall consist of:
1. High yield sodium bentonite.
2. Potable water.
3. Test all water for pH and treat with soda ash, or approved equal, to adjust the pH of the water as required in the accepted mix design(s).
4. Bentonite, polymers, and additives, other than soda ash, shall be NSF/ANSI Standard 060 compliant

C. Hydraulic fluids used in the HAB shall be fire resistant, in accordance with NFPA 241.

2.2 EQUIPMENT

A. HAB and components:
   1. Provide a HAB capable of advancing through the anticipated ground conditions, including Contractor pre-treated ground.
   2. Provide a HAB that meets the requirements specified herein, including:
      a. Provide articulation to allow steering.
      b. Enable guidance to a predetermined reference point.
      c. Provide protection to the electric and hydraulic motors and operating controls against water damage. Parts and components shall be water resistant.
      d. Provide robust and suitable tools on the cutter wheel to avoid the need for replacement during the drive.
      e. Provide an audible and visual fire warning system.
      f. Provide for monitoring of hazardous and explosive gases, with alarms and automatic shut-off.
      g. Provide the HAB and trailing gear with pumps capable of removing water and maintaining satisfactory working conditions for the HAB.
      h. Provide independent back-up pumping system that does not operate from the main HAB power supply for use in emergency situations.
   3. Provide sufficient overcut and cleaning of overcut to prevent binding of cutter head on fines and allow steering. B. Pipe Jacking Equipment:
      a. Provide for control to ensure that the Maximum Allowable Jacking Force will not be exceeded.
      b. Ensure measured hydraulic cylinder extension rates are synchronized with the measured instantaneous excavation rate of the HAB.
      c. Uniform distribution of jacking forces on the end of the pipe by the use of thrust rings and packers.
      d. Provide pipe clamps, or other means, to hold the jacked pipe in place during the retraction of hydraulic jacking rams and insertion of subsequent pipe segments.

B. Remote Control System:
   1. Allow for routine operation of the system without the need for personnel to enter the tunnel.
   2. Display available to the operator, showing the position of the HAB in relation to a design reference together with other information such as roll, pitch, complete guidance system, valve positions, thrust force, cutter head torque, rate of advance, and installed length.
   3. Integrate the system of excavation and removal of spoil and its simultaneous replacement by pipe. As each pipe segment is jacked forward, the control system synchronizes all operational functions of the system.

C. Active Direction Control:
   1. Equip with a high intensity laser to the maximum legal limit if a laser is used.
   2. Provide active steering information that is monitored and transmitted to the operator. As a minimum, this information shall include location of the laser beam or other guidance system on the target and location of the cutter head.
   3. Provide a reference laser, or other submitted device that indicates visually in the jacking shaft that the directional control laser has not been accidentally moved.

D. Provide spoil conveyor system capable of providing the required conveyance capacity.

E. Provide means for accurately measuring water inflow into the tunnel.

PART 3 EXECUTION

3.1 GENERAL

A. Perform all Work in accordance with accepted submittals.

B. Do not commence any tunneling operation until all submittals, including submittals for all related Work specified elsewhere, are reviewed, and accepted by the Owner's Representative Engineer.

C. Maintain a copy of the Contract Documents at the jacking shaft site or other location acceptable to the Owner's Representative Engineer and accessible to the HAB operator.

D. Provide the Owner's Representative Engineer with access to the shaft, HAB equipment, tunnel if accessible, and operations control instrumentation when tunneling.

E. A start-up inspection and testing of all mechanical and hydraulic systems and power supply shall be conducted prior to the commencement of tunneling operations. The Owner's Representative Engineer shall be notified in writing at least three (3) workdays prior to the start-up inspection. Key system and equipment performance data shall be measured and recorded during the inspection, including cutter head freewheeling rotational torque at three different RPMs as selected by the Owner's Representative Engineer, functionality of main and steering jacks, guidance systems, and HAB pitch settings.

F. Pipe jacking operations shall not commence until the concrete thrust block, tremie seal (if selected), and pre-treated ground zones, are in place and have attained the minimum required strength as stated in the accepted submittals.

G. Locate all utilities before commencing tunnel excavation.

H. Protect in-place or relocate existing utility. Remove and replace in-kind any damaged utility.

3.2 WORK AREA PREPARATION AND MAINTENANCE

A. Organize surface equipment in such a manner to enable proper operation, to minimize impacts to property owners, and to maintain traffic control patterns as specified.

B. Provide suitable containment basins made of plastic lining and sandbags for any equipment operating with fuel, hydraulic, or lubrication oils.

C. Maintain and keep all equipment in working order. All oil, hydraulic, and fuel leaks shall be repaired immediately upon discovery. Any leaking equipment shall not be used until repaired. Any fluid shall be contained and cleaned up upon discovery. Provide written notification within 4 hours of discovery.

D. Contain all chemical spills upon discovery and clean up and dispose of spills properly. Provide written notification within 4 hours of discovery.

E. Protect guidance system from accidental movements, i.e., bumping by personnel or equipment.

F. Provide and maintain temporary surface drainage facilities during construction.

3.3 EXCAVATION

A. Alignment Establishment:
   1. Perform surveying in accordance with Section 31 09 13 and as specified herein.
   2. Contractor's Surveyor shall check line and grade shown on the Approved Plans before commencing tunneling operations and immediately report any errors or discrepancies to the Owner's Representative Engineer.
   3. Use the line and grade shown on the Approved Plans to furnish and maintain reference control lines and grades for the sewer pipeline construction.

B. Pretreat the ground outside the shaft to prevent unfavorable ground behavior and groundwater inflow during launch and retrieval procedures as required and specified in Section 31 32 13.

C. Welding of pipe segments:
   1. Ensure trailing ends are square and leading edges are properly prepared for welding
   2. Align pipe segments to avoid introducing directional bias.
   3. Weld joints per accepted work plan, ensure complete periphery weld provides watertight seal and restores structural integrity of casing for jacking

D. Obstructions during tunneling:
   1. Remove, clear, or otherwise make it possible for the HAB to progress past or through an object in accordance with the submitted contingency plan.
   2. The proposal of alternative methods for removing, clearing, or otherwise making it possible for the HAB to progress past an object that does not allow for the direct observation and measurement of the object shall not be considered for additional payment.

E. Upon completion of tunneling and cleaning the casing, perform contract grouting as required and specified in Section 33 05 08.

F. Inspect casing and ensure casing is clean and free of undesirable materials, water, and defects that would impair installation of the carrier pipe as required in Section 33 05 07.23.

G. All excavated material from tunnel construction not used as backfill shall be disposed of in accordance with Sections 31 05 13 Soils for Earthwork, 31 23 16 Excavation, 31 23 17 Trenching, 31 23 23 Fill, and 31 23 30 Shoring and Trench Safety.

3.4 SITE RESTORATION

A. All surface improvements damaged or removed during or associated with the Work shall be reconstructed to the same dimensions, except for pavement thickness, and with the same type materials used in the original Work.
   1. Pavement resurfacing shall be one (1.0) inch greater in thickness than the existing unless otherwise shown on the Approved Plans.
   2. All edges shall be flush and tight.

B. Restoration shall follow construction as the Work progresses and be completed no later than 30 days after the carrier pipe is installed. Any testing or further inspection necessary for final completion and inspection of the pipe shall not be cause for any delay of restoration Work required under this Contract. This provision for restoration shall include all property that was affected by the construction operations. Such final restoration that cannot be performed within the 30-day period due to adverse weather conditions may upon written request, including a proposed procedure and time schedule, be performed as accepted by the Owner's Representative Engineer. Any delayed restoration will be contingent upon providing suitable safe temporary facilities without inconvenience or nuisance in the interim.

C. Before placing in service, clean and remove from the sanitary sewer system, obstructions, dirt, trash, debris, and other materials that will obstruct gravity flow.

END OF SECTION

SECTION 33 05 07.23

CARRIER PIPE INSTALLATION

PART 1 GENERAL

1.1 REQUIREMENTS

A. This section specifies minimum design and performance requirements for the installation of carrier pipe within casing constructed as specified in 33 05 07.22 Horizontal Auger Boring.

B. Furnish all designs, tools, equipment, materials, and supplies and perform all labor required to complete the Work as indicated on the Approved Plans and specified herein.

C. Successfully complete final acceptance testing of the installed sewer pipe as specified in Section 33 01 31 Sewer and Manhole Testing before commencing with backfilling and after completion of backfilling.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 01 15 00 Measurement and Payment.

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. State Regulatory Codes:
   1. California Code of Regulations (CCR), Title 8, Tunnel Safety Orders
   2. CCR, Title 8, Construction Safety Orders, Section 1509 “Injury and Illness Prevention Program
   3. Caltrans (CT) Manual for Encroachment Permits on California State Highways
   4. CT Trenching and Shoring Manual

1.4 DEFINITIONS

A. For additional definitions refer to 33 05 07.22 Horizontal Auger Boring and 31 32 13 Ground Pre-Treatment.

B. Blocking: For this project, dimensional redwood lumber used to support the carrier pipe and secure the pipeline to design line and grade. The top blocking is used to prevent the carrier pipe from floating within the casing during backfill operations.

C. Bulkhead: A watertight wall that separates the casing into sections. For this project, bricks cast in cement mortar and located at both ends of each casing.

D. Carrier Pipe Support: Pre-manufactured or fabricated means to allow alignment of the carrier pipe within the casing and to prevent the movement of the carrier pipe during backfill grouting. Carrier pipe supports include skids, spacers, blocking, etc.

E. Casing Spacers: Pre-manufactured carrier pipe supports attached to the carrier pipe, advanced with the carrier pipe, and used to set the carrier pipe to design line and

grade within a casing. Spacers include legs that support the weight of the carrier pipe and risers that prevent buoyancy.

F. Cast Invert: A cementitious mix poured and screeded to allow the carrier pipe to be set to design line and grade.

G. Cellular Grout: A lightweight cementitious material that contains stable air or gas cells uniformly distributed throughout the mixture in amounts greater than 20 percent and is suitable for complete backfilling of the void space between carrier pipe(s) and casing pipe. Density, both wet and cured, are critical design features.

H. End Seal: System used to seal the open end of the casing with a protruding carrier pipe. Common systems include “boot” and “wrap” and “modular link seals.” The “boot” is a form fitting one-piece that is pulled –on and extends from the casing to the carrier pipe and held in place with stainless steel hose clamps. The “wrap” is a flat sheet which extends from the casing to the carrier pipe and held in place with stainless steel hose clamps. The “modular link seals” are a series of compressible modular links spanning the gap between the casing and carrier pipe. Also see bulkhead.

I. Rails: Parallel set of guides, similar to railroad tracks, used to set the carrier pipe to design line and grade within a casing. The carrier pipe is slid along the rails which are attached near the casing invert.

J. Skid: Dimensional redwood lumber attached parallel to the carrier pipe and are advanced with the carrier pipe. Both top and bottom skids provide for resetting the carrier pipe to line and grade and provide a minimum amount of backfill grouting to fill the void. Skids slide along near the casing invert. Skids are to be cut, dog-eared to allow the skid to ride over weld beads and other small imperfections.

1.5 DESIGN REQUIREMENTS

A. Carrier pipe configuration within casing shall be as shown on the Approved Plans.

B. The following carrier pipe supports shall be permitted for use: casing spacers. The use of blocking, centralizers, wood skids, rails, and saddles shall not be permitted.

C. Casing spacers shall be symmetrical about the vertical axis with an even number of legs and risers.

D. Carrier pipe support legs shall be designed to withstand the total weight of the carrier pipe plus the weight of water within the filled carrier pipe with a factor of safety of at least 3.0.

E. Calculate the maximum anticipated construction loads, buoyancy, and operational loads and ensure that anticipated loads are incorporated into the manufacturer’s design of the carrier pipe subject to the Owner’s review.

1.6 PERFORMANCE REQUIREMENTS

A. Carrier pipe shall be installed within the following tolerances:

B. Line tolerance: plus, or minus two (±2.0) inches of design line.

C. Grade tolerance: ±1.0 inches for each 100 feet of pipeline, or a total grade tolerance of 0.05 feet between appurtenances.

D. No high or low points shall occur along the installed carrier pipe other than as shown on the Contract Documents.

E. Carrier pipe shall be free draining along the pipe invert without depressions that hold water with depth greater than 0.25-inch.

F. The outer most projection of the carrier pipe shall be separated from the inner most projection of the steel casing pipe by at least four (4.0) inches.

G. The carrier pipe shall be capable of meeting the design flow and maximum pressure.

H. Carrier pipe supports shall prevent the movement of the carrier pipe during backfilling.

I. The casing shall be free of standing water and groundwater inflows prior to placing carrier pipe and backfill.

1.7 QUALITY ASSURANCE

A. Requirements outlined below shall be met at the time of bid and remain in force through completion of the project. Subcontracted work does not qualify as experience.
   1. The Contractor installing the carrier pipe shall have at least ten (10) years of carrier pipe installation experience and shall have successfully completed:
      a. Five (5) projects involving installation of carrier pipe inside casing with carrier pipe diameter between 8 inches and 24 inches ID.
      b. Five (5) projects involving installation of carrier pipe inside casing with the same carrier pipe material as specified for this project.
      c. At least one (1) project involving installation of at least 250 continuous feet of carrier pipe installation inside casing.
      d. The required experience and project history shall be that of the Contractor entity performing the work and shall not be satisfied through the experience of individual employees, officers, owners, affiliates, parent companies, subsidiaries, or predecessor firms.
   2. Project Superintendent shall have:
      a. A minimum of five (5) years of experience in the installation of carrier pipes inside casings.
      b. A minimum of five (5) projects, with each project consisting of at least 250 continuous feet of carrier pipe installation inside casing.
      c. Successfully completed two (2) projects involving the installation of carrier pipes inside casings with carrier pipe diameter between 8 inches and 24 inches ID.
      d. Three (3) projects involving installation of carrier pipe inside casing with the same carrier pipe material as specified for this project.
   3. Grout Pump Operator shall have:
      a. A minimum of five (5) years of experience in the installation of carrier pipes inside casings.

b. A minimum of five (5) projects, with each project consisting of at least 250 continuous feet of carrier pipe installation inside casing.
c. Successfully completed two (2) projects involving the installation of carrier pipes inside casings with carrier pipe diameter between 8 inches and 24 inches ID.
d. Successfully completed two (2) projects involving installation of carrier pipe inside casing with the same carrier pipe material as specified for this project.
e. Successfully completed one (1) project involving installation of carrier pipe inside casing with length longer than the longest length required for this project.
f. Operated equipment like the one proposed for this project.

4. Surveyor shall be a Professional Land Surveyor registered in the State of California with experience in underground surveying. Experience shall include:
   a. Five (5) tunnel projects within the last five (5) years,
   b. Transfer of points and line from the surface to below ground,
   c. Closed loop tunnel survey for line and grade.
5. Experience records shall list the five (5) most recent carrier pipe installation projects, including all such projects completed for the Owner, and all projects demonstrating the specified experience. Each experience record shall include name of project; owner of the project; names of contacts including all contact information; carrier pipe material used; carrier pipe diameter; casing pipe internal diameter and longest laying length.
6. The Owner will be the sole judge in determining if the prospective Contractor, project superintendent, and operators meet the specified qualifications and experience requirements.

1.8 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00 Submittal Procedures and as specified herein.

B. Carrier pipe installation submittals shall be coordinated with all relevant submittals, assembled, and submitted as a single, complete, and comprehensive submittal.

C. Where calculations are required to be submitted, they shall be signed and sealed by a Professional Civil Engineer registered in the State of California. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information including page number.

D. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

E. Bidding Submittal:
   1. Submit a Qualifications Statement with the Bid Proposal submittal which includes qualifications and experience records for the following, as described in Part 1.7.A in this Section:
      a. Contractor performing the Work as specified herein.
      b. Project Superintendent.
      c. Grout Pump Operator.
      d. Surveyor.

F. Pre-Construction Submittals:
   1. Detailed carrier pipe-laying schedule. Schedule shall be coordinated with overall schedule for the Project.
   2. Work plan describing proposed procedures, materials, and equipment to transport or jack carrier pipe into position.
   3. Manufacturer's preprinted specifications and operating instructions for proposed pipe carrier system or jacking equipment.
   4. Written confirmation from the carrier pipe manufacturer that the pipe wall and joint configuration to be supplied are appropriate for and consistent with the Contractor's proposed means and methods.
   5. Written handling instructions from the carrier pipe manufacturer.
   6. Design calculations for carrier pipe supports. Clearly state their respective spacing assumed in the calculations. If carrier pipe support design calculations are signed and sealed by a Professional Engineer who is a staff member of the manufacturer, professional engineering registration in the State of California is not required.
   7. Shop drawings showing details of all carrier pipe supports proposed for use.
   8. Shop drawing showing acceptable end seal details.
   9. End seal materials, written recommendations, and installation instructions.
   10. Calculations of maximum anticipated construction loads and buoyancy that might be imposed on the carrier pipe.
   11. As-built survey of casing pipe in both tabular format and AutoCAD format acceptable to the Owner. Scale shall be acceptable to the Owner. Survey shall confirm that carrier pipe can be installed within design tolerances.
   12. Design profile of carrier pipe placement showing carrier pipe supports.
   13. Description of the means and methods of maintaining alignment of the carrier pipe within design tolerances during carrier pipe installation.
   14. Electrical system, lighting system, and onsite power generation details.
   15. Shaft and pipe ventilation system details including fan size and operating parameters.
   16. Potable water sources, handling, and disposal.

G. Construction Submittals:
   1. Daily installation logs with the following information:
      a. Date.
      b. Project name.
      c. Start and finish times for each shift.
      d. Location of pipe by station.
      e. Printed name of operator and signature.
      f. Number of carrier pipe segments installed.
      g. Carrier pipe support ID and location.
      h. Any unusual conditions or events.
   2. Provide all logs by 9 AM the following workday.

H. Post-Construction Submittals:
   1. As-built survey of installed carrier pipe in both tabular format and AutoCAD format acceptable to the Owner. Scale to be acceptable to the Owner.

1.9 SAFETY

A. Train all non-contractor project staff in shaft and tunnel entry operations prior to entry.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide carrier pipe with the following properties:
   1. Nominal Pipe Size: Per plan
   2. Material:
      a. Fusible polyvinyl chloride (FPVC), in accordance with Section 33 05 31.19 Fusible PVC Pipe; or
      b. Fusible HDPE (HDPE), in accordance with Section 33 05 31.20 Fusible HDPE Pipe.

2.2 EQUIPMENT

A. Butt fusion equipment shall be as specified and acceptable to carrier pipe manufacturer.

2.3 END SEALS AND BULKHEADS

A. Bulkheads shall be field fitted of brick and mortar.
   1. Bricks shall be:
      a. Solid, without holes
      b. Manufactured in accordance with ASTM C-902.
   2. Mortar shall be:
      a. Acceptable to carrier pipe manufacturer.
      b. In accordance with brick manufacturer’s written recommendations.

B. End seals boots shall be custom manufactured without seams and secured at both ends with stainless steel bands.

C. Modular link seals designed to completely span and secure the carrier pipe are not permitted.

D. End seal wraps or zippered end seals are not permitted.

PART 3 EXECUTION

3.1 GENERAL

A. Perform all Work in accordance with accepted submittals.

B. Provide Owner with access to the Work.

C. Maintain a copy of the Contract Documents and accepted submittal at a location acceptable to the Owner and accessible to the Owner.

3.2 INSTALLATION OF CARRIER PIPE

A. Carrier pipe installation shall not commence until:
   1. Casing is clean
   2. Casing is leak-free and free of standing water

B. Perform as-built survey of the casing and demonstrate the ability to install carrier pipe within design tolerances prior to commencing carrier pipe installation.

C. Mount carrier pipe to carrier pipe supports to allow for proper alignment of the carrier pipe within design tolerances and to provide the required clearance between the casing and carrier pipes as specified herein.

D. Treat and dispose of all water in accordance with the requirements specified in Section 31 23 19 Dewatering.

E. Perform final acceptance testing of the completed drive upon completion in accordance with Section 33 05 31.19 Fusible PVC Pipe or 33 05 31.20 Fusible HDPE Pipe.

3.3 SITE RESTORATION

A. All surface improvements damaged or removed in the performance of work shall be reconstructed to the same dimensions, and with the same type materials used in the original Work.

B. Restoration shall follow construction as the Work progresses. Any testing or further inspection necessary for final completion and inspection of the pipe shall not be cause for any delay of restoration Work required under this Contract. This provision for restoration shall include all property that was affected by the construction operations.

C. Ensure new sewer pipe is free and clear of all foreign materials before placing in service.

END OF SECTION

SECTION 33 05 07.24

JACKED STEEL CASING

PART 1 GENERAL

1.1 REQUIREMENTS

A. This section provides specifications for steel casing pipe for tunneling using the Horizontal Auger Boring as specified in Section 33 05 07.22 Horizontal Auger Boring.

B. Furnish all designs, tools, equipment, materials, and supplies and perform all labor required to complete the Work as indicated on the Contract Drawings and specified herein.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 01 20 00 Price and Payment.

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Comply with the following industry standards effective at time of bid.
1. ASTM A 36/A 36M, Standard Specification for Carbon Structural Steel 3.
2. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. ASTM A 283/A 283M, Standard Specification for Low and Intermediate
4. Tensile Strength Carbon Steel Plates.
5. ASTM A515 - Standard Specification for Pressure Vessel Plates, Carbon
6. Steel, for Intermediate- and Higher-Temperature Service.
7. ASTM A 568/A 568M, Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, and Structural Quality Cold Roll.

B. State Regulatory Codes: to be current at all times:
1. California Code of Regulations (CCR), Title 8, Tunnel Safety Orders
2. CCR, Title 8, Construction Safety Orders, Section 1509 “Injury and Illness Prevention Program
3. Caltrans (CT) Manual for Encroachment Permits on California State Highways
4. CT Trenching and Shoring Manual

1.4 DEFINITIONS

A. See Section 33 05 07.22 Horizontal Auger Boring.

B. See Section 33 07 07.23 Carrier Pipe Installation.

1.5 PROJECT SITE CONDITIONS

A. See Section 33 05 07.22 Horizontal Auger Boring.

1.6 PERFORMANCE REQUIREMENTS

A. Casing pipe shall be provided for the carrier piping as shown on the Plans.

B. A smaller outside diameter casing pipe may be used if all other criteria are met and with acceptance of the Owner and CT.

C. A larger outside diameter (OD) casing pipe may be used if all other criteria are met and with acceptance of the Owner and CT. Include all requirements imposed by a larger outside diameter casing which includes additional materials, additional utility relocations, impacts to existing structures, and waste disposal. The use of a larger casing OD is not an acceptable cause for a differing site condition.

1.7 QUALITY ASSURANCE

A. Product Data: Includes manufacturer’s product description, handling instructions, installation requirements, shop drawings, operation, maintenance procedures, and samples where applicable, as well as description of methods and materials for installing and protecting the casing, including post installation acceptance tests.

B. Field welding materials shall be compatible with the casing material.

C. Field welder certifications are to be appropriate for welding task and current at time of welding.

1.8 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00 Submittal Procedures and as specified herein.

B. Submittals shall be coordinated with all cross-referenced sections and assembled and submitted as a single, complete, and comprehensive submittal.

C. Where calculations are required to be submitted, they shall be signed and sealed by a Professional Civil Engineer registered in the State of California. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information including page number.

D. All shop drawings shall be legible with dimensions accurately shown and clearly marked in English.

E. Pre-Construction Submittals:
   1. Calculations demonstrating that the casing pipe has been designed to support the maximum anticipated construction and operational loads, with special respect to the maximum anticipated jacking loads. Increase the casing sidewall thickness, as necessary, to withstand the anticipated stresses with a minimum factor of safety of 2.0.
   2. Submit manufacturer's mill specification sheet listing diameter, thickness, and class of steel used in making the casing, and the mill certification.
   3. Submit shop drawing showing casing lay length and joint detail. If welded casing, include rod or wire and steel casing compatibility certification.

4. Submit manufacturer's pipe handling instructions.
5. Casing field repair method.
6. If different casing diameter is used than that indicated on the Contract Drawings, submit written justification, including availability of shield and ancillary equipment for the alternate diameter, whichever is applicable. Provide a table showing revised separation distances of all utilities within 20 feet of the pipeline and shafts.
7. Welder qualifications and welding certifications as needed.
8. Welding work plan and materials.

PART 2 PRODUCTS

2.1 STEEL CASING PIPE

A. Provide casing with minimum outside diameter and plate thickness as shown on the Plans, unless the Contractor elects to change the excavated diameter to fit their means and methods, subject to acceptance by the Owner and CT.

B. The minimum wall thickness of casing passing under the CT right-of-way shall be based on casing size as follows:
   1. 30 inch to 38 inch casing: 0.50 inch minimum wall thickness
   2. 40 inch to 60 inch casing: 0.75 inch minimum wall thickness

C. The casing segments shall not be longer than 10.01 feet for the installed length.

D. Provide casing that is specifically manufactured for tunneling using jacking methods with a smooth outer wall and is manufactured to the following dimensional criteria:
   1. Circumference < 0.5%
   2. Exterior Roundness < 0.5%
   3. End Squareness +/- 1.5 mm
   4. Straightness < 3 mm
   5. Pipe Length +/- 6 mm

E. Comply with ASTM A 36/A 36M, ASTM A 283/ A 283M, Grade D, ASTM A515 Grade 60 or ASTM A 568/A 568M Grade 33 or accepted equal Grade and wall thickness.

F. All casing segments shall be joined by continuous, full circumference, full penetration butt welds or Permalok™ joint.

G. Provide and protect lubrication system. System is to be acceptable to the Owner. Provide for injection of lubrication at the leading edge of the casing pipe.

END OF SECTION

SECTION 33 05 08

BACKFILL GROUT

PART 1 GENERAL

1.1 REQUIREMENTS

A. This section specifies minimum requirements for the cellular grout used to backfill grout the annular space between a carrier pipe and a casing pipe.

B. Furnish all designs, tools, equipment, materials, and supplies and perform all labor required to complete the Work as indicated on the Contract Drawings and specified herein.

1.2 DEFINITIONS

A. For definitions refer to Sections 33 05 07.22 Horizontal Auger Boring and 33 05 07.23 Carrier Pipe Installation.

1.3 REFERENCE SPECIFICARIONS, CODES, AND STANDARDS

A. Comply with the applicable reference Specifications:
1. Section 01 33 00, Contractor Submittals
2. Section 33 05 07.22 Horizontal Auger Boring
3. Section 33 05 07-24, Jacked Steel Casing
4. Section 33 05 07.23, Carrier Pipe Installation
5. Section 33 05 31-19, Fusible PVC Pipe
6. Section 33 05 31-20, Fusible HDPE Pipe

B. Comply with the following industry standards effective at time of bid.
1. ACI 523.1R Guide for Cast-in-Place Low-Density Cellular Concrete
2. ASTM C 150 Specifications for Portland Cement
3. ASTM C 494 Standard Specification for Chemical Admixtures for Concrete
4. ASTM C 495 Standard Test Method for Compressive Strength of Lightweight Insulating Concrete
5. ASTM C 567 Standard Test Method for Unit Weight of Structural Lightweight Concrete
6. ASTM C 796 Standard Method of Testing Foaming Agents for Use in Producing Cellular Concrete Using Preformed Foam
7. ASTM C 869 Standard Specification for Foaming Agents Used in Making Preformed Foam for Cellular Concrete
8. Standard Specifications for Public Works Construction (SSPWC), Section 201-1.

1.4 DESIGN REQUIREMENTS

A. Cellular grout mix shall be designed in accordance with the requirements of ACI 523.1R, ACI 523.3R, and as specified herein. If the event of conflict between the requirements of the listed documents and those specified herein, the requirements of this Section shall prevail.

B. Mixes shall be adjusted in the field as necessary to meet the requirements of these specifications.

1.5 PERFORMANCE REQUIREMENTS

A. 7- and 28-day compressive strength range per ASTM C 495 of the cellular grout shall be:
   1. 7 days: 250 psi minimum
   2. 28 days: 300 psi minimum
   3. 56 days: 300 psi minimum, as acceptance criteria only

B. Dry density shall be between 30 and 35 pounds per cubic foot (pcf) unless a higher density is required to achieve strength requirements or increased cement content for corrosion protection.

C. Preformed foam shall be generated by combining controlled quantities of air, water, and foaming agent under pressure. Foam shall retain its stability until the cement sets to form a self-supporting matrix. The concentration of foam agent shall be in accordance with the foaming agent material manufacturer's recommendations.

1.6 QUALITY ASSURANCE

A. Each proposed mix shall be tested in accordance with ASTM C 796.

B. Test specimens shall be made, cured, stored, and tested in conformity with ASTM C 495.

C. Sample testing shall be performed by a certified laboratory.

D. Sample testing of each proposed mix design shall include the following:
   1. Provide three (3) sets of compression test cylinders (3.0 inches by 6.0 inches), three (3) cylinders per set. One set of three (3) cylinders shall be tested at an age of 7 days, another other set shall be tested at an age of 28 days, and the last set shall be tested at an age of 56 days.
   2. Determine the total air content in accordance with ASTM C 796.
   3. Determine the unit weight in accordance with ASTM C 567.

E. Sample testing of each specimen collected on the field shall include:
   1. Provide one (1) set of four (4) test samples for each shift when backfill grout is placed. One (1) additional set of four (4) test samples shall be made from each additional 200 cubic yards, or major fraction thereof, placed in any one shift. Two (2) samples from each set shall be tested at an age of 28 days. The other two (2) samples shall be tested at an age of 56 days.
   2. Provide one (1) set of four (4) test samples from the overflow after excess water and approximately one (1) cubic yard of cellular grout has been wasted. Testing shall be the same as above.
   3. Measure as-cast unit weight (wet density) at point of injection.
   4. Measure as-cast unit weight (wet density) at point of overflow after excess water and approximately one (1) cubic yard of cellular grout has been wasted.

F. Compressive strength of cellular grout shall be considered satisfactory if conditions 1 and 2 are both met or condition 3 is met:

1. Average of all 28-day compressive strength tests within a single reach equal or exceed the specified unconfined compressive strength of 300 psi.
2. No individual 28-day unconfined compressive strength test is less than 300 psi.
3. All 56-day unconfined compressive strengths within a single reach average greater than 300 psi.

G. Foaming agent manufacturer shall have at least five (5) years of experience manufacturing for similar types of installations.

H. The foaming agent manufacturer's field services representative shall approve all changes to the proposed mix designs in the field.

I. Maximum allowable injection pressure shall not use a factor of safety less than the greater of 2.0 or that recommended by the carrier pipe manufacturer.

1.7 CONTRACTOR SUBMITTAL

A. Submittals shall be made in accordance with Section 01 33 00 and as specified herein.

B. Backfill grout submittals shall be coordinated with all relevant submittals, assembled, and submitted as a single, comprehensive submittal.

C. Where calculations are required to be submitted, they shall be signed and sealed by a Professional Civil Engineer registered in the State of California. Calculations shall clearly identify all parameters used, state all assumptions made in the calculation, and identify all sources of information.

D. Pre-Construction Submittals:
   1. Mix designs for each cellular grout mix proposed for use. Each mix design shall include the following:
      a. Type, brand, source, and amounts of cement, pozzolans, admixtures, and other additives.
      b. Amount of water.
      c. Combined grading of aggregates.
      d. Specific gravity of all materials.
      e. Compressive strength test results.
   2. Provide material specifications and manufacturer's mixing instructions for each design mix ingredient.
   3. Provide results of all pre-construction tests specified herein.
   4. Provide written acceptance of by pipe manufacturer in Section 33 05 31-19, Fusible PVC Pipe or Section 33 05 31-20, Fusible HDPE Pipe. Acceptance shall include acceptance of:
      a. Heat of hydration generated during backfill grouting
      b. Proposed grouting means and method
      c. Placement of casing spacers
      d. Pressure testing of assembled carrier pipe

E. Construction Submittals:
   1. Calculate estimated volume of backfill grout by lift and reach.
   2. Calculate maximum allowable injection pressure by lift and reach.
   3. Provide field testing results as specified herein.

4. Provide records documenting cement content.
5. Provide records of injected volume and maximum injection pressure at point of injection by lift and reach.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide Portland Cement conforming ASTM C 150, Type V.

B. Provide potable water free from deleterious amounts of alkali, acid, and organic materials which would adversely affect the setting time or strength of the cellular grout. Conform to SSPWC 201-1 with pH not less than 6.7.

C. Concrete Admixtures:
   1. Shall not contain chlorides that promote corrosion.
   2. Retarder/Water Reducer: Conforming to ASTM C 494, Type D.
   3. Plasticizer/Water Reducer: Conforming to ASTM C 494, Type A.
   4. Admixtures shall only be used with foaming agent when specifically approved in writing by foam agent manufacturer.

D. Foaming Agent:
   1. Shall comply with ASTM C 869 when tested in accordance with ASTM C 796.

PART 3 EXECUTION

3.1 GENERAL

A. Perform work in accordance to accepted submittals.

B. Cellular grout shall be mechanically mixed to produce a uniform distribution of materials.

C. Follow the manufacturer’s recommendations concerning the order of charging the mixer with the various ingredients.

D. The admixture content, batching method, and time of introduction to the mix shall be in accordance with the manufacturer’s written recommendations for minimum shrinkage and for compliance with these specifications.

E. Compare field test results to submitted test results and modify mix design as necessary to meet requirements specified herein.

F. Obtain field measurements as specified herein.

3.2 FIELD TESTING

A. Each set of compression test cylinders shall be marked or tagged with the date and time the samples were made, stationing of placement, batch number, and the unit

weight (wet density) measured at the point of placement, unless otherwise specified herein.

B. Specimens shall be collected at the point of injection, unless otherwise specified herein.

END OF SECTION

SECTION 33 05 13

MANHOLES AND STRUCTURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Monolithic concrete manholes and structures, including catch basin, and channel drains, with transition to cover frame, covers, anchorage, and accessories.
   2. Modular precast concrete manhole and structures with tongue-and-groove joints, covers, anchorage, and accessories.
   3. Bedding and cover materials.

B. Related Sections:
   1. Section 03 30 00 - Cast-in-Place Concrete
   2. Section 31 05 13 - Soils for Earthwork: Soil for backfill in trenches.
   3. Section 31 05 16 - Aggregates for Earthwork: Aggregate for backfill in trenches.
   4. Section 31 23 16 - Excavation: Excavating for manholes and structures.
   5. Section 31 23 23 - Fill: Backfilling after manhole and structure installation.
   6. Section 33 01 33 - Manhole Rehabilitation

1.2 REFERENCES

A. American Concrete Institute:
   1. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:
   1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
   2. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
   3. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.
   4. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.
   5. ASTM C923 - Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes and Laterals.

1.3 DESIGN REQUIREMENTS

A. Equivalent strength: Based on structural design of reinforced concrete as outlined in ACI 318.

B. Design of Lifting Devices for Precast Components: In accordance with ASTM C913.

C. Design of Joints for Precast Components: In accordance with ASTM C913; maximum leakage of 0.025 gallons per hour per foot of joint at 3 feet of head.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit cover and frame construction, features, configuration, and dimensions.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with Caltrans Standard Plans.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Comply with precast concrete manufacturer’s instructions for unloading, storing and moving precast manholes and structures.

C. Store precast concrete manholes and structures to prevent damage to Owner’s property or other public or private property. Repair property damaged from materials storage.

D. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers shown on Drawings to indicate its intended use.

PART 2 PRODUCTS

2.1 MANHOLES AND STRUCTURES

A. Manhole Sections:
   1. Reinforced precast concrete in accordance with ASTM C478
   2. Gaskets in accordance with ASTM C923.

B. Interior Coating, as indicated on Drawings.

2.2 FRAMES AND COVERS

A. Product Description:
   1. Construction: ASTM A48, Class 30B cast iron.
   2. Cover: Removable and boltable as indicated on plan.
   3. Live Load Rating: H20

2.3 CONFIGURATION

A. Shaft Construction: Concentric with eccentric cone top section; lipped male/female joints; sleeved to receive pipe sections.

B. Shape: Cylindrical.

C. Clear Inside Dimensions: As indicated on Drawings.

D. Design Depth: As indicated on Drawings.

E. Clear Cover Opening: As indicated on Drawings.

F. Pipe Entry: Furnish openings as indicated on Drawings.

2.4 BEDDING AND COVER MATERIALS

A. Bedding: Coarse Aggregate Subbase Fill as specified in Section 31 05 16.

B. Soil Backfill from Above Pipe to Finish Grade: Soil Select Fill, as specified in Section 31 05 13

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify items provided by other sections of Work are properly sized and located.

C. Verify built-in items are in proper location, and ready for roughing into Work.

D. Verify correct size of manhole and structure excavation.

3.2 PREPARATION

A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

B. Do not install structures where site conditions induce loads exceeding structural capacity of structures.

C. Inspect precast concrete structures immediately prior to placement in excavation to verify structures are internally clean and free from damage. Remove and replace damaged units.

3.3 INSTALLATION

A. Excavation and Backfill:

1. Excavate for manholes and structures in accordance with Section 31 23 16 in location and to depth shown. Provide clearance around sidewalls of structure for construction operations.
2. When groundwater is encountered, prevent accumulation of water in excavations. Place manholes and structures in dry trench.
3. Where possibility exists of watertight structure becoming buoyant in flooded excavation, anchor structure to avoid flotation.

B. Place base pad, trowel top surface level.

C. Place manhole and structure sections plumb and level, trim to correct elevations, anchor to base pad.

D. Backfill excavations for manholes and structures in accordance with Section 31 23 23.

E. Form and place manhole and structures cylinder plumb and level, to correct dimensions and elevations.

F. Cut and fit for pipe.

G. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour to form continuous drainage channel.

H. Set cover frames and covers level without tipping, to correct elevations.

I. Coordinate with other sections of Work to provide correct size, shape, and location.

3.4 PRECAST CONCRETE MANHOLE AND STRUCTURE INSTALLATION

A. Lift precast components at lifting points designated by manufacturer.

B. When lowering manholes and structures into excavations and joining pipe to units, take precautions to ensure interior of pipeline and structure remains clean.

C. Set precast structures bearing firmly and fully on crushed stone bedding, compacted in accordance with provisions of Section 31 23 16 or on other support system shown on Drawings.

D. Assemble multi-section structures by lowering each section into excavation. Lower, set level, and firmly position base section before placing additional sections.

E. Remove foreign materials from joint surfaces and verify sealing materials are placed properly. Maintain alignment between sections by using guide devices affixed to lower section.

F. Joint sealing materials may be installed on site or at manufacturer’s plant.

G. Verify manholes and structures installed satisfy required alignment and grade.

H. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe. Fill annular space with mortar.

I. Cut pipe to finish flush with interior of structure.

J. Shape inverts through manhole and structures as shown on Drawings.

K. Surface preparation and coating application as shown on Drawings.

3.5 FRAME AND COVER INSTALLATION

A. Set frames using mortar and masonry.

B. Set frame and cover 2 inches above finished grade for manholes with covers located within unpaved areas to allow area to be graded away from cover beginning 1 inch below top surface of frame.

C. Install inflow protector insert below cover.

3.6 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Test concrete manhole and structure sections in accordance with ASTM C497.

END OF SECTION

SECTION 33 05 31.19

FUSIBLE PVC PIPE

PART 1 GENERAL

1.1 REQUIREMENT

A. The Contractor shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the Work as indicated in the Contract Documents.

B. The Contractor shall furnish, install, and test fusible polyvinylchloride (FPVC) pipe, fittings, and appurtenances of the dimensions and to the lines and grades shown on the Contract Documents.

C. This section covers the furnishing and installation of FPVC pipe and fittings for sanitary sewer, as specified and shown in the Contract Documents.

D. Excavation and backfill, including the pipe bedding, shall conform to the provisions of Section 31 23 17 Trenching and Section 31 05 16 Aggregates for Earthwork.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 01 20 00 Price and Payment.

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. All Work specified herein shall conform to or exceed the applicable requirements of the referenced portions of the following publications to the extent that the provisions thereof are not in conflict with other provisions of these Specifications.

B. Comply with the current provisions of the following codes and standards current at the time of bid.
1. AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1,500 mm)
2. AWWA M23 AWWA Manual of Supply Practices PVC Pipe – Design and Installation, Second Edition
3. ASTM D1784 Specifications for Rigid Polyvinyl Chloride (PVC) Compounds
4. ASTM D1785 Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120
5. ASTM D2152 Test Method for Degree of Fusion of Extruded Polyvinyl Chloride (PVC) Pipe and Molded Fittings by Acetone Immersion
6. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series)
7. ASTM D3139 - Standard Specifications for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

C. Comply with the applicable reference specifications as directed in the General Conditions.

1.4 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 as specified herein.

B. Submittals shall be coordinated with all relevant submittals, assembled, and submitted as a single complete and comprehensive submittal.

C. Pre-construction submittals:
   1. Qualifying submittals as described in Part 1.6.A in this Section:
      a. Contractor's pipe designer PE.
      b. Certification from pipe manufacturer that Contractor is qualified to join, lay, and handle pipe.
      c. FPVC fusion technician's experience and qualifications demonstrating conformance with Quality Assurance requirements specified herein.
      d. Written certification from the FPVC pipe fusion equipment supplier that the fusion technician has received training in the proper use of the fusion equipment and the manufacturer's recommended fusion equipment.
   2. Manufacturer's technical. data including:
      a. Pipe Size
      b. Dimensionality
      c. Pressure Class per applicable standard
      d. Color
      e. Recommended Minimum Bending Radius
      f. Recommended Maximum Safe Pull Force
   3. Manufacturer's written recommendations for transport, handling, storage, and repair of the FPVC pipe shall be included.
   4. Recommendations for shipping, handling, lifting, fusing, surface testing, and final testing.
   5. Recommendations for installation within a tunnel including maximum allowable scouring and gouging of the sidewall during installation.
   6. Manufacturer's technical data showing complete information on material composition, physical properties, pressure rating and dimensions of the FPVC pipe. Manufacturer's recommendations for transport, handling, storage, and repair of the FPVC pipe shall be included.
   7. Specifications of fusing machine and fusing procedures and restrictions, including machine cut sheet.
   8. Fusion machine data logger with temperature, date and pressure recording elements.
   9. Design calculations for each pipe size and pipe DR to be furnished.
   10. Pipe manufacturers' joint assembly procedure including cool down time and data logger equipment.
   11. Detailed Pipe Laying Schedule.
   12. Shop drawings and cut sheets providing information on fittings, including dimensions, compliance with standards and pressure rating.
   13. Information on pipe accessories, including but not limited to special adaptors for connections to ductile iron fittings
   14. Certifications: Furnish a certified affidavit of compliance for all pipe and other products or materials furnished under this section, as specified in the referenced standards and the following supplemental requirements:
      a. Hydrostatic test reports.
      b. Three-edge bearing strength test reports.

D. Post-construction submittals
   1. Fusion Data (heater plate temperature, hydraulic cylinder interface pressures, time/duration, etc.) shall be submitted to the Owner within two workdays following the completion of any joint.
   2. FPVC pipe manufacturer shall furnish an affidavit of compliance that all delivered materials comply with the requirements of these specifications.
   3. As-built drawings including pipe joints and appurtenance installations.

1.5 CARE AND HANDLING

A. Pipe shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the Owner.

B. Pipe shall be loaded, off-loaded, and otherwise handled in accordance with AWWA M23, and the pipe supplier's written guidelines shall be followed.

C. Any scratch or gouge greater than 10% of the wall thickness will be considered significant and can be rejected unless determined acceptable by the Owner.

D. Pipe lengths should be stored and placed on level ground. Pipe should be stored at the job site in the unit packaging provided by the manufacturer. Caution should be exercised to avoid compression, damage, or deformation to the ends of the pipe. The interior of the pipe, as well as all end surfaces, should be kept free from dirt and foreign matter.

E. The Contractor shall not store pipe upon the roadway or parkway of residential streets for more than 5 days or upon commercial streets for more than 3 days.

F. Pipe shall be stored and stacked per the pipe supplier's guidelines.

1.6 QUALITY ASSURANCE

A. General
   1. Pipe is subject to UV damage. Pipe is to be protected from direct sunlight.
   2. All piping shall be made from PVC compound conforming to cell classification 12454 per ASTM D1784.
   3. Fusion Technician shall be qualified by the pipe supplier to fuse fusible polyvinyl chloride pipe of the type(s) and size(s) being used. Qualification shall be current as of the actual date of fusion performance on the project.
   4. Fusible polyvinyl chloride pipe shall be used as manufactured under the trade names Fusible C-900®, Fusible C-905®, and FPVC®, for Underground Solutions, Inc., Poway, CA, (858) 679-9551 or Owner approved equal. Fusion process shall be as patented by Underground Solutions, Inc., Poway, CA, Patent No. 6,982,051.
   5. The pipe shall be warranted for one year per the pipe supplier's standard terms.
   6. In addition to the pipe warranty, the fusion services shall be warranted for one year per the fusion service provider's standard terms.

B. Weld Quality Control Documentation: Contractor shall produce and submit field weld reports within two days of welding activity. Report shall provide the following information, at a minimum:
   1. Date, time, and ambient temperature
   2. Joint Number that correlates to Project pipeline stationing
   3. Employee Identification that is unique to Project approved FPVC Fusion Technician
   4. Equipment Identification and specifications including piston area
   5. Pipe Data including material, size, Dimension Ratio
   6. Interfacial Pressure in pounds per square inch (psi) including Heat, Soak, Fuse, and Cool
   7. Recommended Gauge Pressures in pounds per square inch (psi) including Heat, Soak, Fuse, and Cool
   8. Recorded Data including Drag pressure, weld temperature
   9. Graphs of pressure and temperature over time. Provide one graph for the first five minutes of weld procedure and a summary plot of the entire weld and cool down process.

PART 2 PRODUCTS

2.1 FUSIBLE POLYVINYLCHLORIDE PIPE

A. See Section 33 05 07.23 Carrier Pipe Installation for pipe size.

B. Fusible polyvinyl chloride pipe shall conform to AWWA C900, ASTM D2241 or ASTM D1785 as applicable. Testing shall be in accordance with the referenced AWWA standards for all pipe types.

C. Fusible polyvinyl chloride pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.

D. Fusible polyvinyl chloride pipe shall be manufactured in a standard 40’ nominal length or custom lengths as specified.

E. Fusible polyvinyl chloride pipe shall be green in color for identification as a sanitary sewer application.

F. Pipe generally shall be marked per AWWA C900, ASTM D2241, or ASTM D1785 as applicable, and shall include as a minimum:
   1. Nominal pipe size
   2. PVC
   3. Dimension Ratio, Standard Dimension Ratio or Schedule
   4. AWWA pressure class or standard pressure rating for non-AWWA pipe
   5. AWWA standard designation number or pipe type for non-AWWA pipe
   6. Extrusion production-record code
   7. Trademark or trade name
   8. Cell Classification 12454 and/or PVC material code 1120 shall be included

G. Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

H. The Contractor shall coordinate the requirements of this Specification with the requirements of Section 33 05 07.22 Horizontal Auger Boring.

2.2 FUSION JOINTS

A. Unless otherwise specified, fusible polyvinyl chloride pipe lengths shall be assembled in the field with butt-fused joints. The fusion technician shall follow the pipe supplier's guidelines for this procedure. All fusion joints shall be completed as described in this Specification.

2.3 FUSIBLE POLYVINYL CHLORIDE SWEEPS OR BENDS

A. Fusible polyvinyl chloride sweeps or bends shall conform to the same sizing convention, diameter, dimensional tolerances, and pressure class of the pipe being joined by the sweep of bend.

B. Fusible polyvinyl chloride sweeps or bends shall be manufactured from the same fusible polyvinyl chloride pipe being used for the installations and shall have at least 2 feet of straight section on either end of the sweep or bend to allow for fusion of the sweep to the pipe installation. There shall be no gasketed connections utilized with a fusible polyvinyl chloride sweep.

C. Standard fusible polyvinyl chloride sweeps, or bend angles shall not be greater than 22.5 degrees and shall be used in nominal diameters ranging from 4 inches through 16 inches.

2.4 BEDDING AND ENCASEMENT MATERIALS

A. All bedding and encasement materials shall be as shown on the Plans and in Sections 31 05 16 Aggregates for Earthwork and 31 23 17 Trenching, of these Specifications.

PART 3 EXECUTION

3.1 GENERAL

A. Pipe shall be off loaded, loaded, installed, handled, stored, and stacked per the pipe supplier's written guidelines. These guidelines include compliance with the minimum recommended bend radius and maximum safe pull force for the specific pipe being used.

B. The general best practices of the industry per AWWA M23 shall also be observed.

C. Trench excavation, bracing methods, foundation preparation, pipe bedding, trench backfill, and related operations shall be in accordance with the requirements of Section 31 23 17 Trenching.

D. The pipe shall be constructed to the alignment and grade shown. The grade line shown on the profile is the invert or interior bottom of the pipe. The excavation shall be made a sufficient distance below the grade line to allow for the placing of the pipe and the supporting bedding if such bedding is shown. Should the trench be excavated to a depth greater than required, the Contractor shall refill such excess excavation with the same fill material as specified for the overlying fill or bedding and compacted as required for such overlying fill or bedding.

E. Pipelines shall never be used as drains for removing water that has infiltrated into the trenches.

3.2 FACTORY TESTING

A. Not Used

3.3 FUSION PROCESS

A. Fusible polyvinyl chloride pipe will be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with this specification and pipe supplier's guidelines.

B. Fusible polyvinyl chloride pipe will be fused by qualified fusion technicians holding current qualification credentials for the pipe size being fused, as documented by the pipe supplier.

C. Pipe supplier's written procedures shall be followed.

D. Provide a sample joint and conduct testing to verify fusion on site.

E. Each fusion joint shall be recorded and logged by an approved electronic monitoring device (data logger) connected to the fusion machine, which utilizes a current version of the pipe supplier's recommended and compatible software.

F. Only appropriately sized and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. This includes requirements for safety, maintenance, and operation with modifications made for PVC.

G. The FPVC shall not be placed in tension or compression for installation until the pipe has cooled to within 5°F of the ambient temperature as measured in the shade.

3.4 GENERAL INSTALLATION

A. Installation guidelines from the pipe supplier shall be followed for all installations.

B. The fusible polyvinyl chloride pipe will be installed in a manner so as not to exceed the recommended bending radius guidelines.

C. Where fusible polyvinyl chloride pipe is installed by pulling in tension, the recommended maximum safe pulling force, established by the pipe supplier, shall not be exceeded.

D. Internal and external rolled up beads formed at joints during fusion process shall be removed from the inside and outside of the pipe. Removal shall take place immediately after welding is complete. Contractor shall exercise caution to avoid damage to the joint and pipe while removing the bead and shall be responsible for repairs and/or replacement of any damaged joint or pipe.

3.5 FIELD WELDING QUALITY CONTROL

A. General: Contractor shall be responsible for employing a rigorous quality control procedure for field welding quality control and documentation. All field-welding shall be accomplished with Owner-Approved Equipment. Documentation of each field weld shall be submitted to the Owner within two days of weld completion.

B. Data Collector and Recording Device: Contractor shall utilize data collection and recording equipment to verify proper fusion procedures have been followed prior to installation. The Data collector shall consist of a rugged computer to record and report key weld parameters including the heater temperature and fusion pressure profile over time.

3.6 DAMAGED PIPE

A. Pipe sections with gouges or cuts deeper than ten percent (10%) of the wall thickness shall be cut out, removed, and replaced. Undamaged pipe portions may be rejoined using butt-fusion joining methods. No pipe segment shall have an adjacent weld within 10 feet without written acceptance of Owner.

3.7 TESTING AND ACCEPTANCE

A. GENERAL
   1. Scope. All pipe and appurtenances shall be hydrostatically tested for below grade piping systems for pipe material structural integrity and leaks. Bacteriological testing shall also be completed to confirm that piping systems are properly disinfected.

B. HYDROSTATIC AND LEAKAGE TEST
   1. Test Fluid. The test fluid is to be the distribution system potable water. The Contractor shall be responsible for conveying test water from the source 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.
   2. No 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 blow-offs 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.
   3. Test Equipment
      a. Water: Sufficient quantity to fill pipeline section under test. Contractor shall arrange with the Owner for locations for acquiring potable water for testing.

Contractor shall be responsible for all temporary piping, fittings, meters, and appurtenances.

b. Valves: Suitable to isolate pipeline section under test without leaking.
c. Relief Valve: To permit pressure relief if pressure exceeds 20 to 25 percent above the required test pressure to prevent pipeline failure.
d. Pressure Gauge(s): Provide 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.
e. Pressure gauges and relief valves shall be checked for accuracy prior before being used during actual testing of the pipeline.

4. Preparation for Test
   a. Notify Owner a minimum of 3 (three) working days prior to performance of testing. Owner shall monitor all tests.
   b. 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.
   c. 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.
   d. Connect booster pump and provide temporary closures for all external openings in the system. Use caution to ensure that the closures are properly designed and strong enough to withstand the test pressure.
   e. Tighten any flange connections loosened to vent air before applying test pressure.
   f. Permit the test fluid and the pipeline to set undisturbed for a minimum of 24 hours to achieve temperature equilibrium.
5. Test Pressure: 150 percent of the working pressure (225 psi) at point of test and no less than 125 percent of normal working pressure (190 psi) at highest elevation.
6. Test Duration: The hydrostatic and leakage test duration shall be two (2.0) hours.
7. Test Procedure
   a. The test procedures described herein shall be performed for each of the designated pipeline segments.
   b. Completely fill pipeline to be tested with water. The maximum rate of filling shall be limited to produces a maximum flow velocity of one (1.0) foot per second.
   c. Completely bleed off all trapped air during filling.
   d. Close all vents used to vent air from the pipe and restrict access in the test area to only those required for the test.
   e. During the initial expansion phase, slowly raise the pressure utilizing the booster pump until the desired test pressure is achieved.
   f. Add sufficient make-up test fluid to the system, at one-hour intervals for three hours, to maintain the system test pressure. The pipe should have obtained equilibrium.
   g. Turn off the booster pump and hold the final test pressure for the required test duration period.
   h. 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 indicated in the table below, the test fails.

Make-up Water Allowance (U.S. Gallons / 100 Feet of Pipe)		
Nominal DI Pipe Size	**1 Hour Test**	**2 Hour Test**
3	0.10	0.15
4	0.13	0.25
8	0.50	1.00
10	0.75	1.30
12	1.10	2.30
18	2.30	4.50

* These allowances only apply to the test period and not to the initial expansion phase.

i. Total test time shall not exceed eight (8.0) 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 (8.0) hours before another test can be attempted.

8. Flushing
   a. Lines tested with water shall be completely drained.
   b. Pipelines tested shall be flushed after the test and draining is complete.
9. Test Records
   a. Records shall be maintained of all tests performed.
   b. Test records shall include as minimum:
      1) Date and time of beginning and end of pipeline testing
      2) Identification of pipeline being tested
      3) Test Fluid
      4) Test Pressure
      5) Ambient temperature
      6) Pressure gauge reading taken during the test
      7) Quantities of make-up water added during the test
      8) Signatures of Test Technician, Contractor representative whom witnessed the test and the Owner's Representative who witnessed the test
10. Prior to acceptance of the Work by the Owner, the Contractor shall perform pressure testing in accordance with AWWA C600/ C605.
11. When tests indicate Work does not meet specified requirements, remove Work, replace and retest at the Contractor's expense.

END OF SECTION

SECTION 33 05 31.20

FUSIBLE HDPE PIPE

PART 1 GENERAL

1.1 DESCRIPTION

A. This section provides specifications for high density polyethylene (HDPE) pipe (4-inch diameter and larger), HDPE pipe accessories, including fittings, and piping appurtenances. The Contractor shall furnish all material, tools, and equipment and shall perform all labor required to complete the work as indicated in the Standard Specifications, General Conditions and Special Conditions to construct an operating pipeline that conforms to the design.

B. HDPE pipe shall comply fully with AWWA C-906 and ASTM D3350. HDPE pipe shall be of same ID to avoid generating thrust loads, unless noted otherwise. HDPE pipe joints shall be fused, except where detailed otherwise on the plans.

1.2 MEASUREMENT AND PAYMENT

A. Refer to Section 01 15 00 Measurement and Payment.

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. All work specified herein shall conform to or exceed the applicable requirements of the referenced portions of the following publications to the extent that the provisions thereof are not in conflict with the provisions of these Specifications.

B. Comply with the applicable editions of the following codes, regulations, and standards, current at the time of bid.
   1. AWWA C-906 – Polyethylene (PE) Pressure Pipe and Fittings, For Water Distribution
   2. ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping
   3. ASTM D3261 – Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
   4. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
   5. ASTM F714 – Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

1.4 SUBMITTALS

A. Submittals shall be in accordance with the Section 01 33 00 Submittal Procedures as specified herein.

B. Submittals shall be coordinated with all relevant submittals, assembled, and submitted as a single complete and comprehensive submittal.

C. Pre-construction submittals:
   1. Qualifying submittals as described in Part 1.6.A through 1.6.C in this Section:
      a. Contractor's pipe designer PE.
      b. Certification from pipe manufacturer that Contractor is qualified to join, lay, and handle pipe.
      c. HDPE fusion technician's experience and qualifications demonstrating conformance with Quality Assurance requirements specified herein.
      d. Written certification from the HDPE pipe fusion equipment supplier that the fusion technician has received training in the proper use of the fusion equipment and the manufacturer's recommended fusion equipment.
   2. Manufacturer's technical data showing complete information on material composition, physical properties, pressure rating and dimensions of the HDPE pipe.
   3. Certification from Plastic Pipe Institute that pipe manufacturer meets recipe and mixing requirements for resin used to manufacture pipe for this project.
   4. Manufacturer's written recommendations for transport, handling, storage, and repair of the HDPE pipe
   5. Specifications of fusing machine and fusing procedures and restrictions, including machine cut sheet.
   6. Fusion machine data logger capabilities including temperature, date and pressure recording elements.
   7. Design calculations for each pipe size and pipe SDR to be furnished signed and stamped by a PE.
   8. Pipe manufacturers' joint assembly procedure including cool down time and data logger equipment.
   9. Submittals shall include detailed drawings of the pipe, gaskets, joints, pipe special sections, pipe-laying diagrams, and test reports on the properties of the gasket material.
   10. Specifications and data sheets for pipe accessories, including but not limited to special adaptors for connections to ductile iron fittings.
   11. Specifications and data sheets for flange and mechanical joint adapters, including hardware and backer rings. Information shall include manufacturer's written installation directions including alignment and bolt tightening recommendations.
   12. Detailed Pipe Laying Schedule.

D. Post-construction submittals:
   1. Fusion Data (heater plate temperature, hydraulic cylinder interface pressures, time/duration, etc.) shall be submitted to the Owner within two workdays following the completion of any joint.
   2. HDPE pipe manufacturer shall furnish an affidavit of compliance that all delivered materials comply with the requirements of these specifications.
   3. As-built drawings including pipe joints and appurtenance installations.

1.5 QUALIFICATIONS

A. Experience requirements outlined below shall be met at the time of bid and remain in force through completion of the Project. Work subcontracted out does not qualify as experience.

B. HDPE pipe joining shall be performed by personnel trained in the use of butt-fusion equipment and the recommended methods for new pipe connections.

C. Personnel directly involved with installing the new pipe shall receive training in the proper methods for handling and installing HDPE pipe.

D. Personnel performing fusion welding of HDPE shall have the following minimum experience:
   1. Performed fusion bonding on at least three previous projects.
   2. Performed fusion bonding on at least 20,000 feet of 4-inch to 24-inch HDPE pipe.

1.6 CARE AND HANDLING

A. All pipes shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the Owner.

B. Pipe shall be loaded, off-loaded, and otherwise handled in accordance with AWWA M23, and all of the pipe supplier's written guidelines shall be followed.

C. Any scratch or gouge greater than 10% of the wall thickness will be considered significant and can be rejected unless determined acceptable by the Owner.

D. Pipe lengths should be stored and placed on level ground. Pipe should be stored at the job site in the unit packaging provided by the manufacturer. Caution should be exercised to avoid compression, damage, or deformation to the ends of the pipe. The interior of the pipe, as well as all end surfaces, should be kept free from dirt and foreign matter.

E. The Contractor shall not store pipe upon the roadway or parkway of residential streets for more than 5 days or upon commercial streets for more than 3 days.

F. Pipe shall be stored and stacked per the pipe supplier's guidelines.

1.7 QUALITY ASSURANCE

A. Experience records shall list the five (5) most recent projects, including all PTM projects completed for the OWNER, and all projects demonstrating the specified experience. The experience record shall include name of project; owner of the project; names of contacts including all contact information; HAB size; ground conditions as measured by UCS, ground type per USCS, ground water pressure, longest drive planned and completed; and total footage planned and completed.

B. HDPE Fabricated Fittings:
   1. The fitting fabricator shall have at least three (3) years' experience in the fabrication of pressure-rated HDPE fittings of similar size and complexity as this project.
   2. The Fabrication Shop Supervisor must have at least one (1) year experience of shop supervision and three (3) years of experience fabricating HDPE fittings.
   3. The technician fabricating the HDPE fabricated fittings shall have the following minimum experience:

a. Two (2) years' experience fabricating HDPE fittings.
b. Fabricated at least forty (40) fittings that are DR21 or thicker and 4-inch to 24-inch diameter.

C. HDPE Fabricated Fittings:
1. The fitting fabricator shall have at least three (3) years' experience in the fabrication of pressure-rated HDPE fittings of similar size and complexity as this project.

D. Weld Quality Control Documentation: Report shall provide the following information, at a minimum:
1. Date, time, and ambient temperature.
2. Joint Number that correlates to Project pipeline stationing.
3. Employee Identification that is unique to Project-approved HDPE Fusion Technician.
4. Equipment Identification and specifications including piston area.
5. Pipe Data including material, size, Dimension Ratio.
6. Interfacial Pressures in pounds per square inch (psi) including Heat, Soak, Fuse, and Cool.
7. Recommended Gauge Pressures in pounds per square inch (psi) including Heat Soak, Fuse, and Cool.
8. Recorded data including drag pressure, weld temperature.
9. Graphs of pressure and temperature over time. Provide one graph for the first five minutes of weld procedure and a summary plot of the entire weld and cool down process.

PART 2 PRODUCTS

2.1 SIZE AND DIMENSIONAL TOLERANCES

A. Pipe shall be round and true. The internal diameter of any portion of each piece of pipe shall be uniform and not vary more than plus or minus 5 percent. The wall thickness shall not be more than 5 percent less than that shown in the design, but in no case more than 3/16 inch less. A wall thickness greater than that required in the design shall not be cause for rejection. Deflected piping shall be installed with the long axis vertical.

B. The variation in laying length of two opposite sides of pipe shall not be more than 1/8 inch per foot of diameter with a maximum of 3/8 inch in any length of pipe, except where beveled pipe is used. The under run in length of a section of pipe shall not be more than 1/8 inch per foot of diameter with a maximum of 1/2 inch in any length of pipe.

C. Lengths: Pipe shall be supplied in nominal lengths of 20 feet or greater. Actual laying length shall be nominal +1 inches or -4 inches. At least 90% of the total footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.

2.2 MATERIALS

A. Pipe and Fittings: The pipe and fittings shall be a high performance, high molecular weight, PE 3608 high density polyethylene pipe. Minimum cell classification value shall be 345464E as referenced in ASTM D 3350. Material shall have a minimum Hydrostatic Design Basis (HDB) of 1600 psi at 73 degrees (F) when tested in accordance with ASTM D2837 and shall be listed in PPI TR-4 by name of the pipe and fitting manufacturer. The fittings shall be fabricated or molded from a polyethylene compound having a cell classification equal to or exceeding the compound used in the pipe or shall be manufactured using the polyethylene compound having a cell qualification equal to or exceeding the cell classification of the pipe supplied.

B. Pipe Size: See Section 33 05 07.23, Carrier Pipe Installation for pipe size.

C. The Owner shall request certified lab data to verify the physical properties of the pipe or may take random samples and have them tested by an independent testing laboratory.

D. Physical Properties of Pipe Compound.
   1. Density – The natural density shall be no less than 0.941 – 0.955 grams/cm3 as referenced in ASTM D 1505.
   2. Melt Flow – Melt flow shall be no greater than 4.0 grams/10 mins. when tested in accordance with ASTM D 1238 – Condition F.
   3. Flex Modulus – Flexural Modulus shall be 110,000 to 160,000 psi as referenced in ASTM D 790.
   4. Tensile Strength at Yield – Tensile strength shall be 3000 to 3500 psi as referenced in ASTM D 638.

E. Contractor shall provide a new pipe sufficient in diameter as specified on the Drawings. The HDPE pipe shall be provided with green stripes for identification as a sanitary sewer application.

F. The wall thickness (SDR) of the new HDPE pipe shall conform to ASTM to withstand all of the forces that will be imposed on the pipe during the tunneling installation, as well as the final in-place loading conditions.

G. Joints
   1. General
      a. HDPE pipe joints shall be butt-fused, except where otherwise indicated on the plans or specified herein.
      b. Electro-fusion joints may be used, with Owner approval, to join HDPE pipe to HDPE pipe within open trenches where butt fusion cannot be practically performed.
      c. Friction or pressure couplings are not acceptable and will not be allowed except where specifically detailed on the plans.
   2. Butt Fusion Joints Butt fusion techniques shall meet all requirements of ASTM D2657 and D3261.
   3. Flanged Joints
      a. Flanged joints shall consist of HDPE flange adapters and flange backing ring, unless otherwise shown on the Drawings.

b. Full face flat ring gaskets of 1/8-inch black reinforced rubber conforming to ANSI B-16.21 shall be installed between the flange adapter and opposing flange. Gaskets shall be full-faced with bolt holes and be held in position by the through-bolts.
c. Flanged backing rings (flanges) shall be ductile iron with polypropylene coating or ductile iron.
d. Flange backing rings shall be compatible with AWWA C110 flanges with ANSI B-16.1, class 125 flange bolting.
e. Flanged backing rings pressure ratings shall meet or exceed the pressure class of the pipe.
f. Flanged Joints shall have a type 316 stainless steel bolt sets (bolt, nut, and washers) or Tripac 2000 Blue coated bolts and nuts. Diameter, number and length of the bolts shall be as determined by the flange adapter manufacturer. Stainless steel hardware shall be installed with anti-seize lubricant.

4. Electro-fusion Joints
a. Shall only be used as system closures with prior written approval of Owner.
b. Electro-fusion joints must have a five (5) year satisfactory history of performance based on information submitted by Contractor for each size and DR of coupling.
c. Joints shall meet AWWA C906 requirements.
d. Joint pressure ratings shall meet or exceed the pipe pressure rating of the adjoining pipe.
e. The inside diameter of an electro-fusion coupling shall match the outside diameter of the adjoining pipe.

H. Fittings
1. HDPE Fittings: Polyethylene (HDPE) fittings shall be made from material meeting the same requirements as the pipe. Polyethylene fittings shall be molded, turned, or otherwise fabricated by the manufacturer of the pipe. All fittings shall be marked with size, dimension ratio (DR), and appropriate ASTM specification number.
a. All fittings shall be pressure tested to four (4) times working pressure of pipe for five seconds or alternative back-bend test as provided for in AWWA C906.
2. Fabricated Fittings: Fabricated Fittings above 24” shall meet the requirements of AWWA C906 with the pressure testing waived.
a. All fittings shall have the same DR as the adjoining pipe.
b. Field fabricated fittings below 24” that do not comply with AWWA C906 or ASTM F2206 are not permissible for this project.
3. Molded Fittings: Molded fittings shall be socket fusion type for fittings under 4-inches, manufactured in accordance with ASTM D2683. Molded fittings shall be butt-fusion type for fitting 4-inches and larger, manufactured in accordance with ASTM D3261.
4. Flange Adapters: Polyethylene flange adapters shall be made with sufficient through-bore length to be clamped in a butt-fusion machine without the use of a stub-end holder. The sealing surface of the flange adapter shall be machined with a series of small V-shaped grooves to provide gasket-less sealing to prevent gasket blow-out.

I. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten (10) percent of the wall thickness shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the manufacturer's recommendations.

J. Any section of the pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling as determined by the Owner shall be discarded and removed from the site.

K. Terminal sections of pipe that are joined within the insertion pits shall be connected with a mechanical coupling (full circle 316 stainless steel long-body repair coupling), electro fusion couplings or two HDPE flanges with type 316 stainless steel back-up rings (join flanges using type 316 stainless steel nuts, bolts and washers). All connections shall be in conformance with the manufacturer's installation procedures.

L. Manhole connections shall be done using HDPE flange with type 316 stainless steel back-up ring, minimum of two 1-1/8" diameter adhesive anchor bolts connected to the manhole base, and HDPE spool with wall anchor imbedded in the cast manhole base. In lieu of the wall anchor and anchor bolts, the Contractor can submit for approval an alternative method recommended by the HDPE pipe manufacturer to resist pullout.

PART 3 EXECUTION

3.1 GENERAL

A. General: HDPE pipe shall be installed in conformance with the manufacturer's written recommendations and shall comply with the alignment and profile indicated by the design drawings.

B. Shipping and Storage: HDPE pressure pipe shall be shipped and stored by supporting the pipe uniformly. Pipe shall be stored in the unit packages provided by the manufacturer.

C. Installation Manual: The manufacturer shall supply an installation manual to the Owner which outlines guidelines for handling, joining, installing, embedding, and testing of polyethylene pipeline. These guidelines shall be used as reference material for the Owner in the determination of the required procedures.

3.2 FACTORY TESTING

NOT USED

3.3 JOINING OF PIPE

A. Heat Fusion Joining: Joints between plain end pipes shall be made by the butt fusion method. All internal and external beads shall be removed to within 1/8-inch of the existing sidewall. The bead shall be removed down to, or just above the pipe's sidewall surface, but never below it.

B. HDPE pipe shall not be joined to existing pipe or adjacent segments until a minimum of 24 hours has elapsed to allow for temperature equalization and stress relief. HDPE pipe stretched beyond its elastic limit or damaged in any way shall be rejected.

C. Conduct a sample weld and test for complete fusion on site.

D. For pipe sizes larger than 36 inches in diameter, struts must be provided and installed per the manufacturer's recommendations. However, the struts shall not cause more than 12% vertical elongation; in no case will horizontal elongation be permitted.

E. For open trench portions of the alignment, adjustment of pipes to lines and grade shall be made by scraping away or filling in and tamping material under the body of the pipe throughout its entire length, and not by blocking or wedging. All bedding materials must be mechanically compacted/consolidated to a minimum of 90% standard proctor or as required by the Owner.

F. The HDPE shall not be placed in tension or compression for installation until the pipe has cooled to within 5°F of the ambient pipe temperature.

G. Pipe is subject to UV damage. Pipe is to be protected from direct sunlight.

3.4 INSTALLATION OF PIPE

A. For installation requirements of Horizontal Auger Boring, see Section 33 05 07.22. Refer to the paragraphs below for installation with other types of construction methods.

B. Joints: Joints between plain ends of polyethylene pipe shall be made by butt fusion when possible. The pipe manufacturer's fusion procedures shall be followed at all times as well as the recommendations of the fusion machine manufacturer. The wall thicknesses of the adjoining pipes and fittings shall have the same DR.

C. Mechanical Fittings: If mechanical fittings (which are designed for or tested and found acceptable for use with polyethylene pipe) are utilized for transitions between pipe materials, repairs, joining pipe sections, saddle connections, or at other locations; the recommendations of the mechanical fitting manufacturer must be followed. These procedures may differ from other pipe materials.

D. Butt Fused Joints: A bend back test shall be performed for every 50 fusions or 3000 ft. of pipe. The trial fusion shall be allowed to cool completely, then fusion test straps shall be cut out. The test strap shall be 12-inches or 30 times the wall thickness in length (minimum) and one inch, or 1.5 times the wall thickness in width (minimum). Bend the test strap until the ends of the strap touch. If the fusion fails at the joint, a new trail fusion shall be made, cooled completely, and tested. Butt fusion of pipe to be installed shall not commence until a trial fusion has passed the bent strap test.

3.5 FIELD WELDING QUALITY CONTROL

A. General: Contractor shall be responsible for employing a rigorous quality control procedure for field welding quality control and documentation.

B. Weld Quality Control Documentation: Contractor shall produce and submit field weld reports within two days of welding activity.

3.6 DAMAGED PIPE

A. Pipe sections with gouges or cuts deeper than ten percent (10%) of the wall thickness shall be cut out, removed, and replaced. Undamaged pipe portions may be rejoined using butt-fusion joining methods.

3.7 FLANGE AND MJ ADAPTER INSTALLATION

A. Flanges/MJ adapters shall be attached to pipe and fittings using butt fusion. The flanges/MJ adapters shall be aligned and centered relative to the pipe. Flanges/MJ adapters should be square with the valve or other flange before tightening of bolts. Bolts should not be used to draw flanges into alignment. Bolt threads shall be lubricated, and flat washers shall be used under flange nuts. Bolts shall be tightened using a "star tightening pattern". See manufacturer's recommendations. Twenty-four hours after first tightening the flange bolts, they must be re-tightened using the same "star tightening patter" used above. The final tightening torque shall be as indicated by the manufacturer.

3.8 TESTING AND ACCEPTANCE

A. GENERAL
   1. Scope. All pipe and appurtenances shall be hydrostatically tested for below grade piping systems for pipe material structural integrity and leaks. Bacteriological testing shall also be completed to confirm that piping systems are properly disinfected.

B. HYDROSTATIC AND LEAKAGE TEST
   1. Test Fluid. The test fluid is to be the distribution system potable water. The Contractor shall be responsible for conveying test water from the source 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.
   2. No 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 blow-offs 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.
   3. Test Equipment
      a. Water: Sufficient quantity to fill pipeline section under test. Contractor shall arrange with the Owner for locations for acquiring potable water for testing. Contractor shall be responsible for all temporary piping, fittings, meters, and appurtenances.
      b. Valves: Suitable to isolate pipeline section under test without leaking.
      c. Relief Valve: To permit pressure relief if pressure exceeds 20 to 25 percent above the required test pressure to prevent pipeline failure.

   d. Pressure Gauge(s): Provide sufficient number of pressure gauges with 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.
   e. Pressure gauges and relief valves shall be checked for accuracy prior before being used during actual testing of the pipeline.
4. Preparation for Test
   a. Notify Owner a minimum of 3 (three) working days prior to performance of testing. Owner shall monitor all tests.
   b. 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.
   c. Confirm that the pipeline is properly backfilled up to a minimum of the primary backfill levels and that all required thrust blocks and in-line restraints are in place prior to start of the pressure test.
   d. Connect booster pump and provide temporary closures for all of the external openings in the system. Use caution to ensure that the closures are properly designed and strong enough to withstand the test pressure.
   e. Tighten any flange connections loosened to vent air before applying test pressure.
   f. Permit the test fluid and the pipeline to set undisturbed for a minimum of 24 hours to achieve temperature equilibrium.
5. Test Pressure: 150 percent of the working pressure (225 psi) at point of test and no less than 125 percent of normal working pressure (190 psi) at highest elevation.
6. Test Duration: The hydrostatic and leakage test duration shall be two (2.0) hours.
7. Test Procedure
   a. The test procedures described herein shall be performed for each of the designated pipeline segments.
   b. 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 (1.0) foot per second.
   c. Completely bleed off all trapped air during filling.
   d. Close all vents used to vent air from the pipe and restrict access in the test area to only those required for the test.
   e. During the initial expansion phase, slowly raise the pressure utilizing the booster pump until the desired test pressure is achieved.
   f. Add sufficient make-up test fluid to the system, at one-hour intervals for three hours, to maintain the system test pressure. The pipe should have obtained equilibrium.
   g. Turn off the booster pump and hold the final test pressure for the required test duration period.
   h. 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 indicated in the table below, the test fails.

Make-up Water Allowance (U.S. Gallons / 100 Feet of Pipe)		
Nominal DI Pipe Size	**1 Hour Test**	**2 Hour Test**
3	0.10	0.15
4	0.13	0.25
8	0.50	1.00
10	0.75	1.30
12	1.10	2.30
18	2.30	4.50

* These allowances only apply to the test period and not to the initial expansion phase.

i. Total test time shall not exceed eight (8.0) 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 (8.0) hours before another test can be attempted.

8. Flushing
   a. Lines tested with water shall be completely drained.
   b. Pipelines tested shall be flushed after the test and draining is complete.
9. Test Records
   a. Records shall be maintained of all tests performed.
   b. Test records shall include as minimum:
      1) Date and time of beginning and end of pipeline testing.
      2) Identification of pipeline being tested.
      3) Test Fluid
      4) Test Pressure
      5) Ambient temperature
      6) Pressure gauge reading taken during the test.
      7) Quantities of make-up water added during the test.
      8) Signatures of Test Technician, Contractor representative whom witnessed the test and the Owner's Representative who witnessed the test
10. Prior to acceptance of the Work by the Owner, the Contractor shall perform pressure testing on sewer systems in accordance with AWWA C600/ C605.
11. When tests indicate Work does not meet specified requirements, remove Work, replace, and retest at the Contractor's expense.

END OF SECTION

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SECTION 33 31 00

SANITARY UTILITY SEWERAGE PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. 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 and backfill required by this section.
   4. Section 31 23 17 - Trenching: Execution requirements for trenching required by this section.
   5. Section 31 23 23 - Fill: Requirements for backfill to be placed by this section.

1.2 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 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.

1.3 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.4 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.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout 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.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance Caltrans Standard Plans.

1.7 FIELD MEASUREMENTS

A. Verify field measurements and elevations are as indicated.

1.8 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 municipal sewer utility service, and trenching.

PART 2 PRODUCTS

2.1 SANITARY SEWAGE PIPE

A. Plastic Pipe: SDR 35 or PS46, ASTM D3034, Poly (Vinyl Chloride) (PVC) material; pipe sizes 6 through 18 inches for sewer mains and 4 inch for laterals, bell and spigot style rubber ring sealed gasket joint.
   1. Fittings: PVC.
   2. Joints: ASTM F477, elastomeric gaskets.

2.2 UNDERGROUND PIPE MARKERS

A. Plastic Ribbon Tape: Bright colored, continuously printed, minimum 4 inches wide by 4 mil thick, manufactured for direct burial service.

2.3 BEDDING AND COVER MATERIALS

A. Bedding: Fine Aggregate Fill as specified in Section 31 05 16.

B. Soil Backfill from Above Pipe to Finish Grade: Select Fill Soil Type, as specified in Section 31 05 13.

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 17.

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.

C. Install bedding at sides and over top of pipe to minimum compacted thickness of 6 inches.

D. Refer to Section 31 23 17 for backfilling and compacting requirements. Do not displace or damage pipe when compacting.

E. Connect to building sanitary sewer outlet and municipal sewer system.

F. Install plastic ribbon tape continuous over top of pipe buried 12 inches below finish grade, above pipe line; coordinate with Section 31 23 23.

G. 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. Perform test on site sanitary sewage system in accordance with American Water Works Association standards and Section 33 01 32.

C. Pressure Test: Test in accordance with Section 33 01 32.

D. Deflection Test: Test in accordance with Section 33 01 32.

E. Request inspection prior to placing bedding.

F. Compaction Testing: In accordance with ASTM D698, ASTM D2922, ASTM D3017.

G. When tests indicate Work does not meet specified requirements, remove work, replace and retest.

H. Frequency of Compaction Tests: One test for each 12 inches of fill in each 100 feet of trench.

3.6 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout 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

(ENCLOSED SEPARATELY)

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PART 6
APPENDICES

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APPENDIX A
GEOTECHNICAL REPORT

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Final Geotechnical Report

MCSD Highway Sewer Crossings
McKinleyville, California

February 20, 2026

Prepared by:

Crawford & Associates, Inc.
4701 Freeport Boulevard
Sacramento, CA 95822

Prepared for:

GHD
718 3rd Street
Eureka, CA 95501

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Sacramento
Chico
Eureka
Modesto
Santa Rosa
Seattle
Ukiah

February 20, 2026
Crawford File No. 20-640.3

GHD
718 3rd Street
Eureka, CA 95501

Attention: Patrick Sullivan, PE

Subject: Final Geotechnical Report
MCSD Highway Sewer Crossings
McKinleyville, California

Dear Mr. Sullivan,

Crawford & Associates, Inc. (Crawford) presents this final Geotechnical Report for the MCSD Highway Sewer Crossings project in McKinleyville, California. Crawford prepared this report in accordance with the agreement order No. 380-006083 between GHD (Client) and Crawford, dated June 2, 2025.

This report includes a brief description of site conditions and the proposed development, discussions regarding field and laboratory investigation, subsurface conditions, engineering geology, and geotechnical conclusions and recommendations for the design and construction of the proposed project. The appendices to the report include logs of borings and the results of laboratory tests.

We appreciate the opportunity to be of service on this project. Should you have any questions regarding this report or if we can be of further service, please do not hesitate to contact the undersigned.

Respectfully Submitted,
Crawford & Associates, Inc.,

Taha Ashoori, PE, GE
Senior Engineer



Reviewed By,

Chris Trumbull, PE, GE, D.GE
Senior Project Manager



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Appendix B

Boring Legend
Boring Logs

Appendix C

Laboratory Test Results

1 INTRODUCTION

1.1 PURPOSE

Crawford & Associates, Inc. (Crawford) prepared this draft Geotechnical Report for the proposed improvements at the three existing sewer lines crossing SR 101 in McKinleyville, California. The purpose of this study was to evaluate subsurface soil and groundwater conditions and develop geotechnical recommendations for design and construction of the proposed sewer line retrofit.

1.2 SCOPE OF SERVICES

To prepare this report, Crawford:

- coordinated with the design team to confirm alignment, design depths, and trenchless crossing geometry;
- reviewed previous geotechnical information and geologic maps;
- reviewed previous Crawford documents for the projects dated October 23, 2020 and January 21, 2026.
- drilled, logged, and sampled six exploratory borings to depths ranging from about 26.5 to 51.5 feet (ft) below ground surface (bgs);
- perform laboratory testing of selected samples recovered from the exploratory borings.
- performed geotechnical analysis; and
- developed conclusions and recommendations based on the data and test results.

Limitations of this study are discussed in the final section of this report.

2 PROJECT AND SITE DESCRIPTION

McKinleyville Community Services District (MCSD) plans to retrofit three existing sanitary sewer crossings of State Route 101 (SR 101), consisting of the Northern Crossing (Letz Avenue Lift Station), Middle Crossing (Thiel Avenue), and Southern Crossing (near Mill Creek). The crossing sites are located west of McKinleyville along SR 101 and extend into adjacent private properties and to Thiel Avenue. Approximate coordinates are 40.9604° / -124.1161° for the Northern Crossing, 40.9463° / -124.1162° for the Middle Crossing, and 40.9263° / -124.1104° for the Southern Crossing. The approximate project locations are presented in Figure 1 Vicinity Map.

Surrounding land uses include private property, residential development, and recreational fields, with nearby river and creek corridors; the Mad River and Norton Creek are in the vicinity of the Northern Crossing, and the Mad River and Mill Creek are in the vicinity of the Southern Crossing, where Mill Creek crosses the alignment.

Based on the conceptual sewer crossing plans prepared by GHD (dated 08/28/2025) and discussions with the design team, the retrofit is anticipated to be constructed using trenchless horizontal auger boring. The proposed crossings consist of 12- to 18-inch-diameter high-density polyethylene (HDPE) carrier pipe installed within 42-inch-diameter steel casing. The three crossings range in length from approximately 278 to 363 feet and invert depths are roughly 12 to 17 ft bgs. The proposed jacking and receiving pits are anticipated to extend to depths of approximately:

- North Crossing: East ~ 26 ft, West ~ 14 ft
- Middle Crossing: East ~ 16 ft, West ~ 14 ft
- South Crossing: East ~ 12 ft, West ~ 14 ft

At the Northern Crossing, the preferred jacking shaft location is approximately 25 feet east of the top of a relatively level terrace on the east side of SR 101 and is occupied by low vegetation and bushes on the order of 15 feet tall; a residential structure is located approximately 100 feet east of the proposed shaft. The preferred receiving shaft location is just east of the existing Letz Avenue Lift Station building in a relatively level area enclosed by chain-link fencing and surrounded by trees in excess of 50 feet tall; an alternate receiving shaft location is south of the pump station building. At the Middle Crossing, the eastern shaft location is within the southbound lane of Thiel Avenue and is surrounded by residential structures and unimproved land, and the western shaft location is on relatively level, unimproved ground on the west side of SR 101 surrounded by trees in excess of 50 feet tall; the contractor will determine which shaft will serve as the jacking shaft. At the Southern Crossing, the preferred shaft locations are on slightly sloping grazing land on the east and west sides of SR 101, with low-lying grasses present at both shaft areas; the contractor will determine which shaft will serve as the jacking shaft.

3 PREVIOUS INVESTIGATIONS BY CRAWFORD

Crawford previously completed a Phase 1 Geotechnical Memorandum for the MCSD Highway Sewer Crossings project, dated October 23, 2020. The memorandum summarized the available preliminary geotechnical and geologic information in the project vicinity and outlined the recommended approach to the subsurface exploration program for the proposed SR 101 sewer crossings.

For Phase 2, Crawford performed a site-specific subsurface exploration program and prepared a revised Geotechnical Data Report (GDR), dated January 21, 2026, which provides geotechnical data which is the basis for the geotechnical analyses and recommendations presented in this GDR. The Phase 2 effort included review of available project information and plans, completion of six exploratory borings between October 14 and 16, 2025 to a maximum depth of approximately 51.5 feet bgs, and representative laboratory testing on selected samples. The GDR documents the field exploration procedures, subsurface conditions encountered, groundwater observations, laboratory test results, and presents the boring logs and supporting data developed for the project.

4 REGIONAL GEOLOGY AND SEISMICITY

The crossing sites are located in the Coast Range geologic province which is a region of high seismic activity. The region contains uplifted Pleistocene terrace deposits consisting of granular deposits that have been incised by the Mad River, its tributaries, and recent and historical thrust faults.

The Mad River Fault Zone trends northwest in close proximity to the crossing sites. The northern and southern crossings are more than 800 feet from the edge of the Alquist-Priolo Special Studies Zone and the middle crossing is approximately 60 feet east of the edge of the Fault Zone.

5 SUBSURFACE CONDITIONS

5.1 SUBSURFACE MATERIALS

Subsurface materials encountered in the exploratory borings generally include interbedded granular and fine-grained deposits to the maximum explored depth (approximately 50 feet bgs). The upper zone (typically within about the upper 10 to 15 feet) is predominantly sand and silty sand, with localized intervals of gravel with sand and clayey sand (locally with gravel).

The intermediate zone (generally on the order of 15 to 30 feet bgs) is characterized by alternating layers of lean clay and lean clay with sand, locally described as gravelly lean clay with sand, with interbedded sand, silty sand, and clayey sand. The deeper zone (generally below approximately 30 feet) commonly includes well-graded sand, clayey sand (locally with gravel), and gravelly sand/gravel-with-sand mixtures, with occasional intervals of lean clay.

5.2 GROUNDWATER

Groundwater was encountered during our field investigation in borings R-25-002, A-25-004, R-25-005, and R-25-006, at the time of drilling. A summary of the groundwater observations is provided in Table 1.

Table 1: Summary of Crawford Groundwater Measurements (2025)

Boring I.D.	Depth (ft)	Date of Reading	Surface Elevation (ft)	Groundwater	
				Depth (ft)	Elevation (ft)
A-25-001	26.5	10/14/2025	50.0	Not Encountered	
R-25-002	51.5	10/16/2025	65.0	11.5	53.5
A-25-003	26.5	10/14/2025	89.0	Not Encountered	
A-25-004	31.5	10/14/2025	94.0	17.5	76.5
R-25-005	31.5	10/15/2025	34.0	10.0	24.0
R-25-006	51.5	10/15/2025	32.0	22.0	10.0

A review of publicly available groundwater information from a nearby monitoring well site at 2277 North Bank Road in McKinleyville, located approximately 1.5 miles southeast of the South Crossing includes readings collected from five temporary monitoring wells on 09/27/2025. Based on these nearby well data, the historic high groundwater (HHGW) in the vicinity of the south crossing could be as shallow as 5 feet bgs.

It should be noted that groundwater levels may fluctuate due to seasonal variations, rainfall, river level, irrigation, or other factors. Evaluation of such factors is beyond the scope of this study.

6 LABORATORY TESTING

Laboratory tests were performed on selected samples recovered from the borings to aid in the classification of soils and to evaluate pertinent engineering properties of the foundation soils. The following tests were performed:

- ASTM D1140 – Amount of Material Finer Than the No. 200 in Soils by Washing
- ASTM D1498m – Redox Potential
- ASTM D2216/ASTMD7263 – Moisture and Density Content of Soil Specimens
- ASTM D2166 Unconfined Compressive Strength
- ASTM D3080 – Direct Shear (3 Points)
- ASTM D4318 – Plasticity Index of Soils
- ASTM D6913 – Particle Size Distribution
- CTM 417 – Sulfate Content
- CTM 422m – Chloride Content
- CTM 643 – Minimum Resistivity and pH of Soil and Water

Laboratory testing was performed in general accordance with applicable ASTM Standards and California Test Methods. Results of all laboratory tests are presented in Appendix C.

7 CORROSION EVALUATION

Corrosion test results on subsurface material samples are summarized in Table 2.

Table 2: Soil Corrosion Testing Summary

Boring I.D. / Sample No.	Depth Interval (ft)	pH	Minimum Resistivity (ohm-cm)	Chloride (mg/kg)	Sulfate (mg/kg)	Redox Potential (mV)	Sulfides Presence	Points
A-25-001-1B	5.5-6	6.94	4850	13.7	35.4	299	Negative	2
R-25-002- 4B	10.5-11	5.35	14250	8.9	5.5	375	Negative	2
A-25-003-5C	15-15.5	5.98	25370	16.1	2.9	380	Negative	2
A-25-004-4C	15-15.5	6.76	6840	9.3	18	320	Negative	2
R-25-005-3B	15.5-16	6.4	6560	11.8	29.1	194	Negative	2
R-25-006-4B	15.5-16	4.97	1110	22	424.6	112	Negative	10

The AWWA 10-point system[1] was used to evaluate the potential for external corrosion potential on ferrous metals from the subsurface materials. The results of the 10-point system analysis were 10 points for samples from A-25-001, 2, 3, 4, and 5, had 2 points, indicating a non-corrosive environment. The sample obtained from R-25-006 resulted in 10 points which indicates a corrosive environment.

[1] American Water Works Association (2018), Polyethylene Encasement for Ductile-Iron Pipe Systems, AWWA C105/A21.5

According to ACI 318[2], a sulfate content of less than 1,000 parts per million (ppm) is considered negligible regarding corrosion potential. A chloride content, per ACI 318, of less than 500 ppm is generally considered non-corrosive to reinforced concrete. The sample tested was below the ACI thresholds, indicating a non-corrosive environment for reinforced concrete.

The provided corrosion test results are only an indicator of corrosion potential. Corrosion potential can vary at different locations and/or depths. The designer should consult with a corrosion engineer if the value is considered significant to the design.

8 LIQUEFACTION POTENTIAL

Soil liquefaction can occur when saturated, relatively loose sand and specific soft, fine-grained saturated soils (typically within the upper 50 feet) are subject to ground shaking strong enough to create soil particle separation that results from increased pore pressure. This separation and subsequent pore pressure dissipation can lead to decreased soil shear strength and settlement. Liquefaction is known to occur in soils ranging from low-plasticity silts to gravels. However, soil most susceptible to liquefaction are clean sands to silty sands and non-plastic silts. Granular soils with SPT blow count $(N1)_{60} \geq 30$, rock, and most clay soil are not liquefiable. Liquefaction susceptibility of a soil deposit is a function of the soil grain size, relative density, percent fines, plasticity of fines, degree of saturation, age of deposit, and earthquake ground motion.

To evaluate the potential for soil liquefaction to occur at the project site, Crawford used the "simplified procedure" by Youd et al[3] and guidelines/modifications consistent with Caltrans liquefaction evaluation procedures, the boring data and laboratory test results, groundwater at measured depth/elevation when drilled, a site-to-fault distance of 11.3 miles, Moment Magnitude (M) of 8.68, and a Peak Ground Acceleration (PGA) of 1.59g. the results of liquefaction analysis is presented in Table 3.

Table 3: Potentially Liquefiable Soil Zones/Layers

Boring ID	Potentially Liquefiable Soil Zones/Layers		Layer Thickness (ft)	Generalized Soil Description	Liquefaction Factor of Safety	Liquefaction (Seismic) Settlement (in)
	Depth (ft)	Elevation (ft)				
R-25-002	N/A	N/A	N/A	Dense Sand	≥1.3	Negligible
R-25-006	N/A	N/A	N/A	M. Dense Sand	≥1.3	Negligible

Based on the liquefaction screening results, the liquefaction potential at the sites is considered negligible, as is the potential for liquefaction-induced settlement.

[2] American Concrete Institute (2025), Building Code Requirements for Structural Concrete, ACI 318
[3] Youd et. Al., (2001): Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils October, 2001.

9 DISCUSSION AND CONCLUSIONS

In general, the borings indicate the trenchless installations will advance through a mix of loose to dense granular soils (predominantly sands, locally silty and/or gravelly) and stiff to hard cohesive soils (lean clay, locally sandy).depending on the specific crossing and line and grade. The soil properties and groundwater depths should be considered in the trenchless design and contractor means-and-methods (e.g., face control, jacking forces, and maintaining line and grade).

Groundwater was encountered during the field investigation in several borings at depths of approximately 10 to 22 feet bgs, which may fall within the planned pit and bore depths depending on final alignment elevations. Groundwater levels may fluctuate due to seasonal variations, rainfall, irrigation, or other factors; evaluation of such fluctuations is beyond the scope of this study.

Based on the subsurface conditions encountered, the site is considered suitable for construction of the proposed SR 101 sewer crossings using trenchless techniques, provided the project-specific geotechnical recommendations are incorporated into design and followed during construction.

10 GEOTECHNICAL RECOMMENDATIONS

The geotechnical design recommendations presented below are based on Crawford's current understanding of the project. Once the project configuration is finalized and the design is complete, Crawford should review the plans and specifications and to evaluate if the geotechnical design recommendations have been incorporated as intended.

10.1 JACK AND BORE CROSSING AND PITS

We understand the bottoms of the jack-and-bore pits at the Northern, Middle, and Southern Crossings are anticipated at depths of approximately 4 to 13 feet bgs. Groundwater was encountered at approximately 10 to 22 feet bgs.

10.1.1 GENERAL

The contractor is responsible for selecting appropriate jack-and-bore installation methods that do not cause detrimental settlement, surface heave, damage to existing facilities, and that maintain the designed horizontal and vertical pipe alignments and tolerances. Issues that may affect pipe jacking and boring operations include the depth of soil cover, existing surface facilities, existing underground utilities, and dissimilar types of earth materials along the pipe alignment.

Shoring should be designed to prevent material from entering the pit during all construction operations. Groundwater was encountered near the bottom of the jack and bore pits. However, due to seasonal rainfall or groundwater fluctuation, dewatering may be necessary. At these depths, subsurface materials are predominantly cohesionless, and localized sand and silt layers encountered in some borings may be susceptible to face raveling, caving, or localized instability if saturated by groundwater or surface water infiltration. The contractor should use jack-and-bore installation techniques that maintain excavation face stability and minimize disturbance of the surrounding soil. The contractor should use jack and bore installation techniques that prevent significant caving and flowing of soil into casing. The contractor should also have appropriate contingency plans and equipment in place for stabilizing the excavation face if excessive caving/flowing conditions occur. Contingency plans may include a closed-face excavation system,

face shield at the leading edge of the first pipe casing, use of grouting techniques, dewatering of the trenchless alignment or other suitable methods. The face of the excavation should not extend more than 1 ft beyond the end of the casing pipe.

10.1.2 PIT BOTTOM SUPPORT

Material encountered at the bottom depth of the jack-and-bore pits generally consists of stiff to hard lean clay and clayey silt with localized zones of dense to very dense silty sand and sand, as observed in Borings A-25-002, A-25-004, and A-25-005. The bottom of the pit should be reviewed to confirm the in-situ soil is suitable for the stability of trenchless installation equipment. If unstable subgrade conditions are encountered, or if the subgrade becomes destabilized by the introduction of water and disturbance, consideration should be given to overexcavating the base an additional 18 to 24 inches and replacing the material with clean ¾-inch crushed rock placed over a woven stabilization fabric, such as Mirafi 600x or equal.

10.1.3 SOIL PARAMETERS

The design of the shoring system and determining jacking resistance is the responsibility of the contractor. The soil properties in Table 4 can be used in designing the shoring system and determining jacking resistance.

Table 4: Idealized Soil Parameters

Crossing	Material	Depth (ft)	Total Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)
North	Sand	0 to 12	125	28	0
	Sand	12 to 20	130	32	0
	Clay	20 to 38	125	0	1,500
Middle	Sand	0 to 30	135	35	0
South - East	Sand	0 to 6	125	30	250
	Clay	6 to 22	125	0	1,000
	Sand	22 to 50	135	35	250
South - West	Clay	0 to 6	125	0	1,000
	Sand	6 to 17	125	30	250
	Sand	17 to 23	135	35	250
	Clay	23 to 31	125	0	1,500

10.2 CONSTRUCTION CONSIDERATIONS

10.2.1 SOIL EXCAVATABILITY

Based on the conditions observed in our subsurface explorations and our experience, the on-site soil should be excavatable with typical excavation equipment backhoes and excavators.

10.2.2 DEWATERING

Groundwater was encountered at approximately 10 to 22 feet bgs in four of the six borings (see Table 1 in Section 5.2 for detail), which could be within the planned trench or jack-and-bore pit excavation depths. Due to the potential for seasonal rainfall or groundwater fluctuations, localized groundwater seepage or perched water conditions may be encountered during construction. If groundwater is encountered and is observed to adversely affect excavation stability or construction operations, the contractor should be responsible for designing and implementing appropriate dewatering measures. Dewatering, if required, should be sufficient to maintain excavation stability and to provide at least approximately 3 feet of clearance below the bottom of the planned excavations during construction.

10.2.3 BACKFILL AND COMPACTION

Jacking and receiving pits and pipe bedding within the pipe zone should be backfilled by recommend compacting trench backfill in 8-inch maximum loose lifts, moisture conditioning to within 2% of optimum moisture content to a minimum 95% relative compaction per ASTM D1557. Jetting is not acceptable for compaction of trench backfill.

Native soil removed from trenching operations is anticipated to be generally suitable for reuse as backfill but necessitate moisture conditioning to achieve compaction. Import material used for backfilling should meet the following criteria:

- Plasticity Index of less than 15;
- Organic content of less than 2%;
- Grain Size:

Sieve Size	Percentage Passing
3-inch	100
No. 4	35 - 100
No. 30	20 - 100
No. 200	5 – 45

Imported material should be approved by Crawford prior to its delivery to the site.

Placement of engineered fill material should be verified by a Crawford geotechnical representative on a continuous basis. Nuclear density testing should be performed on each lift of compacted fill to confirm compaction.

10.2.4 SHORING AND TEMPORARY CONSTRUCTION SLOPES

At a minimum, all shoring and temporary construction slopes should be in accordance with current OSHA requirements. For planning and preliminary design. Anticipate OSHA sloping requirements for Type C material. Isolated locations of unstable sandy soil 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.

11 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 prior to construction.
- Monitor construction to check and document our report assumptions. At a minimum, Crawford should observe excavations and monitor trench subgrade support conditions.
- Observe material submittals and imported fill.
- 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.

12 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 and Caltrans 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 on the site. Actual conditions will vary along the project alignment. 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.

Logs of our explorations are presented in Appendix B. The lines designating the interface between soil types are approximate. The transition between soil types may be abrupt or gradual. Our recommendations are based on the final logs, which represent our interpretation of the field logs and general knowledge of the site and geological conditions. 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.

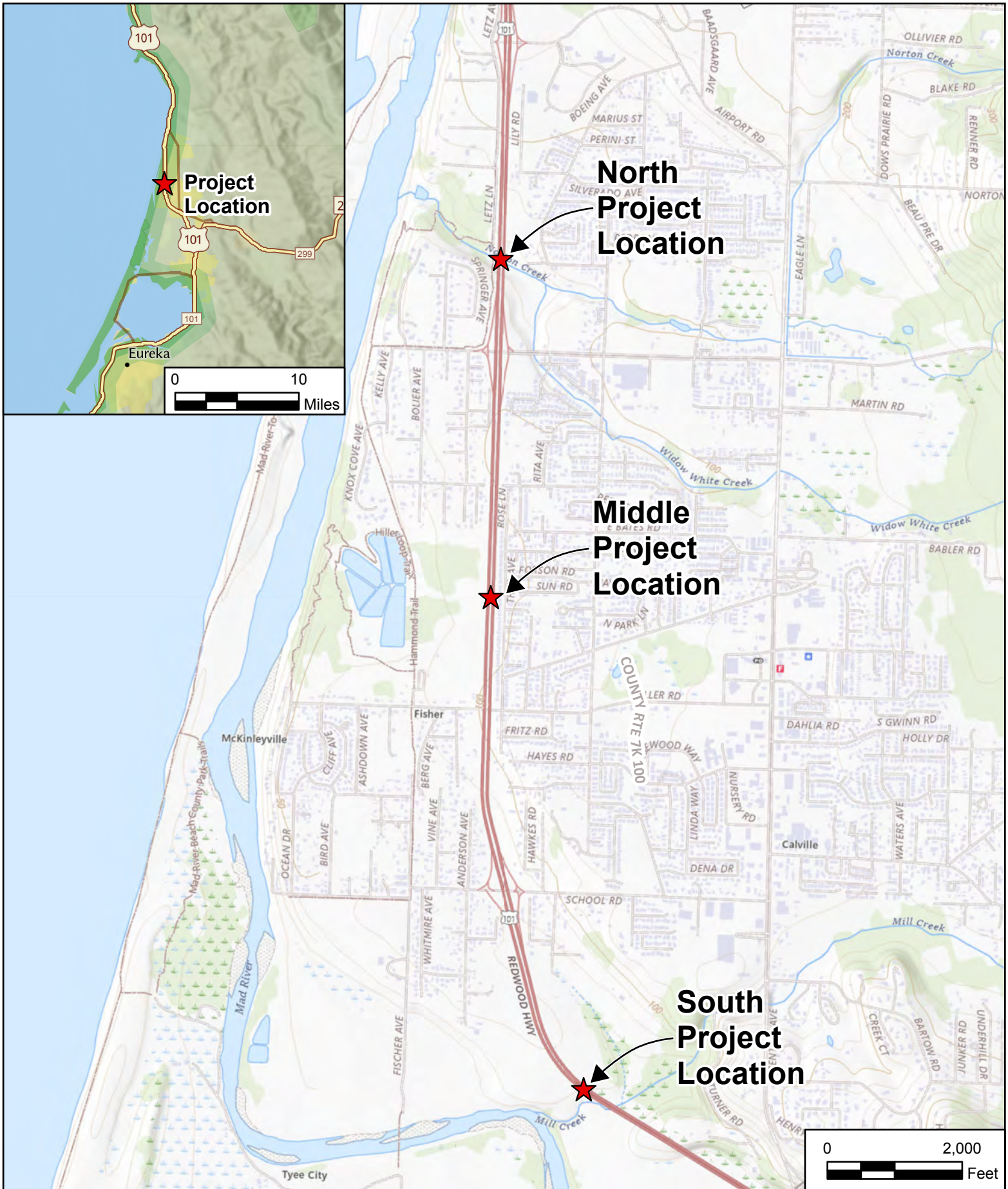
Appendix A

Figure 1: Vicinity Map

Figure 2A: North Crossing Exploration Map

Figure 2B: Middle Crossing Exploration Map

Figure 2C: South Crossing Exploration Map



NORTH

References

1. Base Map: USGS Topographic Map Layer, ArcGIS Pro, ESRI

2. Insert Base Map: National Geographic Style, ArcGIS Pro, ESRI

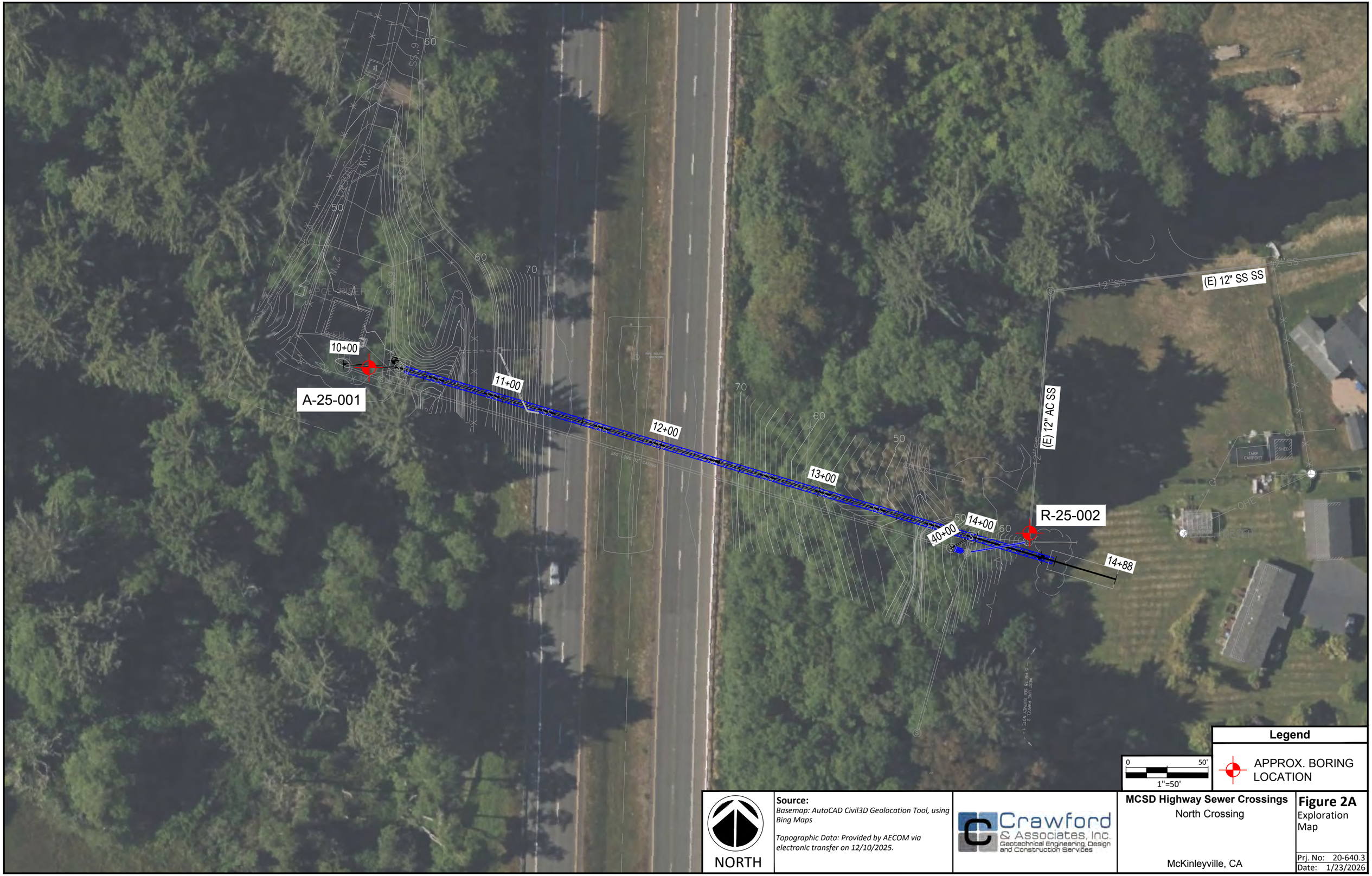
Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

MCSD Highway Sewer Crossings

McKinleyville, CA

Figure 1
Vicinity Map

Prj. No: 20-640.3
Date: 1/30/2026



Source:
Basemap: AutoCAD Civil3D Geolocation Tool, using Bing Maps

Topographic Data: Provided by AECOM via electronic transfer on 12/10/2025.

Crawford & Associates, Inc.
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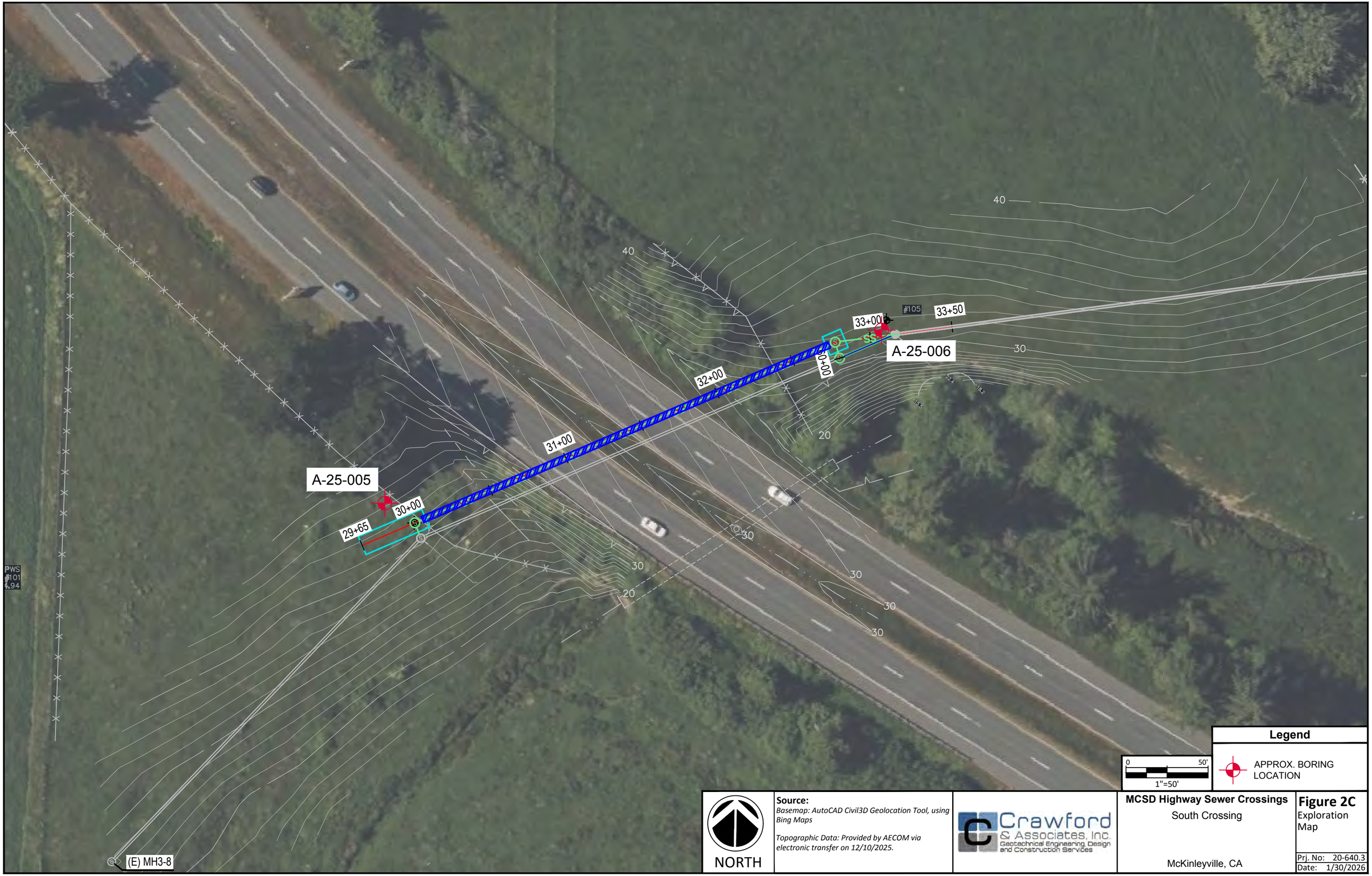
MCSD Highway Sewer Crossings
North Crossing

McKinleyville, CA

Figure 2A
Exploration Map

Prj. No: 20-640.3
Date: 1/23/2026


85
90
A-25-003
19+63
20+00
21+00
22+00
23+00
23+41
A-25-004
(E) MH7-11
90
85
0
50'
1"=50'
Legend
APPROX. BORING LOCATION
NORTH
Source:
Basemap: AutoCAD Civil3D Geolocation Tool, using Bing Maps
Topographic Data: Provided by AECOM via electronic transfer on 12/10/2025.
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MCSD Highway Sewer Crossings
Middle Crossing
McKinleyville, CA
Figure 2B
Exploration Map
Prj. No: 20-640.3
Date: 1/30/2026



Legend

APPROX. BORING LOCATION

NORTH

Source:
Basemap: AutoCAD Civil3D Geolocation Tool, using Bing Maps

Topographic Data: Provided by AECOM via electronic transfer on 12/10/2025.

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MCSD Highway Sewer Crossings
South Crossing
McKinleyville, CA

Figure 2C
Exploration Map

Prj. No: 20-640.3
Date: 1/30/2026

Appendix B

Geotechnical Exploration Summary and Logs

GEOTECHNICAL EXPLORATION SUMMARY

Crawford completed a subsurface exploration at the project site between October 14 and 16, 2025, that included six drilled borings. Subcontractor Taber Drilling drilled the borings under the supervision of Crawford. A summary of the subsurface explorations is provided in Table B-1; exploration logs are attached to the end of this Appendix. See Appendix A, Figures 2A, 2B and 2C for the exploration locations.

Table B-1: Crawford Subsurface Exploration Summary

Boring I.D.	Completion Date	Boring Depth (ft)	Surface Elevation (ft)	Drill Rig Type[1]
A-25-001	10/14/2025	26.5	50.0	CME 55 Crawler Track
R-25-002	10/16/2025	51.5	65.0	CME 55 Crawler Track
A-25-003	10/14/2025	26.5	89.0	CME 55 Crawler Track
A-25-004	10/14/2025	31.5	94.0	CME 55 Crawler Track
R-25-005	10/15/2025	31.5	34.0	CME 55 Crawler Track
R-25-006	10/15/2025	51.5	32.0	CME 55 Crawler Track

(1) An automatic hammer was used with the CME 55 Crawler Track rig; hammer energy efficiency equal to 81% was used for the drill rig.

DRILLING AND SAMPLING

Borings were excavated using a CME 55 Crawler Drill equipped with 4-inch diameter solid-stem augers and mud rotary augers. Borings were drilled to a depth ranging between 26.5 to 51.5 feet. Soil samples were recovered from the borings by means of 2.0-inch O.D. Standard Penetration Test split-spoon sampler (ASTM D1586) without liners and a 3.0-inch O.D. “Modified California” split-spoon sampler (ASTM D3550) with 2.4-inch I.D. liners. The samplers were each advanced with the 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; however, Taber reported an energy efficiency of 81% (CME 55 Crawler Drill). At completion, exploratory borings were backfilled with cement grout.

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 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 sampler refusal criterion is defined as 50 or more blows with less than 6-inches of sampler advancement. Sampler penetration resistance was recorded to provide a field measure of relative densities and can be correlated to soils strength and bearing characteristics. The field-recorded blow counts are shown on the boring logs.

We planned the general location and depth of the test borings for this study based on our discussions with GHD. We include a soil legend with descriptions and an explanation of the descriptive terms used to log the soil samples. The boring log legend and boring logs are included in Appendix B.

Selected portions of recovered soil samples from the driven samplers were retained in sealed containers for laboratory testing and reference. The bulk soil samples collected from the auger cuttings were placed in plastic bags for laboratory testing and reference.

LOGGING

The borings were logged by Crawford staff engineer in general accordance with the visual-manual procedure for description and identification of soils per ASTM D2488. The staff geologist prepared the recovered samples for subsequent reference and laboratory testing. At the completion of drilling, the borings were backfilled with tremie grout, patched with concrete, and dyed black. The exploratory boring logs are presented in Appendix B.

SAMPLER PENETRATION RESISTANCE (N-VALUE)

The in-situ sampler penetration resistance (N-value) in blows per foot (bpf) was recorded in the field to obtain an approximate measure of the dynamic resistance of the soil, to provide a field measure of relative densities, and to correlate to soil strength and bearing characteristics. The N-value was recorded as the number of hammer blows necessary to drive the sampler the final 12 inches of the 18-inch sample interval, unless refusal was met.

The SPT N-value adjusted to 60% hammer energy (N_{60}) is used to provide an index of the apparent density of cohesionless soils, some soil strength parameters, and sometimes (albeit less reliably) to estimate the consistency of cohesive soils. The energy corrected N_{60} value normalized for effective overburden stress, referred to as $(N_1)_{60}$, is typically used to correlate soil strength parameters and bearing characteristics.

For non-standard samplers (i.e., non-SPT samplers such as MCAL), the in-situ N-value are corrected to an Equivalent SPT N-Value[4], then adjusted to provide an Equivalent N_{60} and/or Equivalent $(N_1)_{60}$ value that can be correlated to soil strength and bearing characteristics for use in geotechnical analysis.

The in-situ (uncorrected) N-values are shown on the exploration logs attached to this Appendix.

EXPLORATION LOCATIONS AND ELEVATIONS

The exploration locations were measured in the field with respect to existing site features.

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
CL	Collapse Potential
CP	Compaction Curve
CR	Corrosion, Sulfates, Chlorides
CU	Consolidated Undrained Triaxial
DR	Drained Residual Shear Strength
DS	Direct Shear
EI	Expansion Index
M	Moisture Content
OC	Organic Content
P	Permeability
PA	Particle Size Analysis
PI	Liquid Limit, Plastic Limit, Plasticity Index
PL	Point Load Index
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value
SE	Sand Equivalent
SG	Specific Gravity
SW	Swell Potential
TV	Pocket Torvane
UC	Unconfined Compression - Soil
	Unconfined Compression - Rock
UU	Unconsolidated Undrained Triaxial
UW	Unit Weight

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- Standard California Sampler (ID 2.0 in.)
- Modified California Sampler (ID 2.5 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-25-001

PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: RLM
DEPTH OF BORING: 26.5 (ft)

BEGIN DATE: 10/14/2025
COMPLETION DATE: 10/14/2025
SURFACE ELEVATION: 50.0 (ft)
SURFACE CONDITION: Soil
WATER DEPTH: Not Encountered
READING TAKEN: N/A
HAMMER EFFICIENCY: 81 (%)

DRILLING CONTRACTOR: Taber Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: CME 55 Crawler Drill
HAMMER TYPE: Automatic; 140 (lbs); 30 (in) drop
SAMPLER TYPE & SIZE: Bulk, 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)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
50	0		0						Poorly-graded GRAVEL with SAND (GP); gray; moist; mostly coarse to fine GRAVEL and SAND; few non plastic fines.	100		0	0			5		GS
49	1																	
48	2																	
47	3																	
46	4																	
45	5		1	3 1 2	3					89								GS CR
44	6								Well-graded GRAVEL with SILT and SAND (GW-GM); gray; wet; mostly coarse to fine GRAVEL; some coarse to fine SAND; few low plastic fines.					22.5	102.6	7		phi = 31.5 degrees, C = 270 psf
43	7																	
42	8		2	3 1 1	2					61				28.4	96.1			phi = 32.0 degrees, C = 582 psf
41	9																	
40	10		3	2 3 2	5				CLAYEY SAND (SC); gray; wet; mostly fine to medium SAND; some low plastic fines.	89				23.3	97.2	13		
39	11																	
38	12																	
37	13		4	3 5 10	15					89								GS
36	14								Well-graded SAND with CLAY (SW-SC); gray; wet; mostly medium SAND; some low to medium plastic fines.							8		
35	15																	
34	16		5	5 12 18	30				Lean CLAY with SAND (CL); gray; wet; mostly medium plastic fines; some medium SAND.	89				10.3	126.6			phi = 37.0 degrees, C = 1,098 psf

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4701 Freeport Blvd
Sacramento, CA 95822
(916) 455-4225

PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: A-25-001
ENTRY BY: CZ
CHECKED BY: CT

ELEVATION (ft)	DEPTH (ft)	FIELD: SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	LABORATORY: PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD	CASING DEPTH	REMARKS
33	17								Lean CLAY with SAND (CL); gray; wet; mostly medium plastic fines; some medium SAND.										
32	18																		
31	19																		
30	20		6	27 44 50/4	94					89									
29	21																		
28	22																		
27	23																		
26	24																		
25	25		7	14 16 22	38					100									
24	26																		
23	27								Bottom of borehole at 26.5 ft bgs										
22	28																		
21	29																		
20	30																		
19	31																		
18	32																		
17	33																		
16	34																		
15	35																		
14	36																		

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Crawford & Associates, Inc.
4701 Freeport Blvd
Sacramento, CA 95822
(916) 455-4225

PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: A-25-001
ENTRY BY: CZ
CHECKED BY: CT

LOG OF BORING R-25-002

PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: RLM
DEPTH OF BORING: 51.5 (ft)

BEGIN DATE: 10/16/2025
COMPLETION DATE: 12/16/2025
SURFACE ELEVATION: 65.0 (ft)
SURFACE CONDITION: Soil
WATER DEPTH: 11.5 ft
READING TAKEN: 10/16/25
HAMMER EFFICIENCY: 81 (%)

DRILLING CONTRACTOR: Taber Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: CME 55 Crawler Drill
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)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
64	1								SILTY SAND (SM); yellowish gray; moist; mostly fine SAND; some non-plastic fines.									
63	2																	
62	3		1	4 5 10	15					100								
61	4																	
60	5		2	21 23 22	45				Orange; moist.	100				8.5	94.3	25		
59	6																	
58	7																	
57	8		3	17 19 25	44				Orangish brown; moist.	100				10.3	94.3			
56	9																	
55	10																	
54	11		4	12 18 22	40				Brown.	100				19.5	105.9	47		Mud-Rotary after 10 feet. CR phi = 37 degrees, C = 0 psf
53	12																	
52	13		5	11 17 35	52				Wet.	100				24.4	101.9			
51	14																	
50	15								Well-graded SAND (SW); brown; moist; mostly medium to fine SAND; trace low plastic fines.									
49	16		6	18 22 24	46					67				22.9	103.4	4		

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: R-25-002
ENTRY BY: CZ
CHECKED BY: CT

ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	LABORATORY: PLASTICITY INDEX	LABORATORY: LIQUID LIMIT	LABORATORY: MOISTURE (%)	LABORATORY: D. DENSITY (PCF)	LABORATORY: % PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
48	17								Well-graded SAND (SW); brown; moist; mostly medium to fine SAND; trace low plastic fines.									
47	18		7	17 24 31	55					67								
46	19																	
45	20		8	20 26 30	56					67				21.9	104.5			
44	21																	
43	22																	
42	23		9	20 26 35	61					67								
41	24								Lean CLAY (CL); gray; moist; mostly medium plastic fines; trace fine SAND.									
40	25		10	10 11 16	27	4.00	0.61			67				22.3	105.0	80		
39	26																	
38	27																	
37	28																	
36	29																	
35	30		11	7 10 15	25	2.75	0.60		Wet.	94								
34	31																	
33	32																	
32	33																	
31	34																	
30	35		12	11 18 30	48	+4.5	0.52		Few fine SAND.	94								
29	36																	

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: R-25-002
ENTRY BY: CZ
CHECKED BY: CT

FIELD											LABORATORY								
ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD	CASING DEPTH	REMARKS
28	37								Lean CLAY (CL); gray; moist; mostly medium plastic fines; trace fine SAND.										
27	38																		
26	39								Well-graded SAND with CLAY (SW-SC); gray; wet; mostly fine to medium SAND; few low to medium plastic fines.										
25	40		13	23						94									
24	41			26	47														
				21															
23	42																		
22	43																		
21	44																		
20	45		14	36					Trace to few low plastic fines.	83									
19	46			38	70														
				32															
18	47																		
17	48																		
16	49																		
15	50		15	25						94									
14	51			34	75														
				41															
									Bottom of borehole at 51.5 ft bgs										
13	52																		
12	53																		
11	54																		
10	55																		
9	56																		

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: R-25-002
ENTRY BY: CZ
CHECKED BY: CT

LOG OF BORING A-25-003

PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: RLM
DEPTH OF BORING: 26.5 (ft)

BEGIN DATE: 10/14/2025
COMPLETION DATE: 12/14/2025
SURFACE ELEVATION: 88.5 (ft)
SURFACE CONDITION: Soil
WATER DEPTH: Not Encountered
READING TAKEN: N/A
HAMMER EFFICIENCY: 81 (%)

DRILLING CONTRACTOR: Taber Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: CME 55 Crawler Drill
HAMMER TYPE: Automatic; 140 (lbs); 30 (in) drop
SAMPLER TYPE & SIZE: MCAL (2.4" ID), Bulk
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)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
88	0		Bulk						SILT with SAND (ML); brown; moist; mostly low plastic fines; little fine SAND.	100								
87	1																	
86	2																	
85	3																	
84	4																	
83	5		1	9 12 17	29				SILTY SAND (SM); yellowish gray; moist; mostly medium to fine SAND; little low plastic fines.	94				7.4	92.9	14		
82	6																	
81	7		2	13 18 21	39					100								
80	8																	
79	9																	
78	10		3	16 19 26	45					100				42.5	77.9			GS
77	11																	
76	12		4	17 22 29	51				Orangish gray.	100				14.2	104.1	6		GS
75	13																	
74	14								CLAYEY SAND (SC); yellowish gray; moist; mostly coarse to fine SAND; little low plastic fines.									
73	15		5	12 19 25	44					100				19.4 19.6	104.1 103.4	16		phi = 34.3 degrees, C = 0 psf CR
72	16																	

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: A-25-003
ENTRY BY: CZ
CHECKED BY: CT

ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD	CASING DEPTH	REMARKS
									CLAYEY SAND (SC); yellowish gray; moist; mostly coarse to fine SAND; little low plastic fines.										
71	17																		
			6	14						100									
70	18			16	39														
				23										18.0	108.6				
69	19																		
68	20		7	12						94									
				20	46				Poorly-graded SAND with CLAY (SP-SC); orangish gray; moist; mostly coarse to fine SAND; few low plastic fines.									
67	21			26															
	22																		
66																			
	23		8	9						94									GS
65				21	48											9			
	24			27															
64																			
	25		9	5						67									
63				19	61														
	26			42															
62									Bottom of borehole at 26.5 ft bgs										
	27																		
61																			
	28																		
60																			
	29																		
59																			
	30																		
58																			
	31																		
57																			
	32																		
56																			
	33																		
55																			
	34																		
54																			
	35																		
53																			
	36																		
52																			

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: A-25-003
ENTRY BY: CZ
CHECKED BY: CT

LOG OF BORING A-25-004

PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: RLM
DEPTH OF BORING: 31.5 (ft)

BEGIN DATE: 10/14/2025
COMPLETION DATE: 12/14/2025
SURFACE ELEVATION: 94.0 (ft)
SURFACE CONDITION: Asphalt
WATER DEPTH: 17.5 ft
READING TAKEN: 10/14/25
HAMMER EFFICIENCY: 81 (%)

DRILLING CONTRACTOR: Taber Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: CME 55 Crawler Drill
HAMMER TYPE: Automatic; 140 (lbs); 30 (in) drop
SAMPLER TYPE & SIZE: MCAL (2.4" ID), Bulk, 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)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD CASING DEPTH	REMARKS
									ASPHALT CONCRETE(3")									
									AGGREGATE BASE(1")									
93	1		Bulk						SILTY SAND (SM); orangish brown; moist; mostly fine to medium SAND; little low plastic fines.	100								
92	2																	
91	3																	
90	4																	
89	5		1	8						67								
88	6			13	35													
				22														
87	7																	
86	8								SILTY SAND (SM); orangish brown; moist; mostly fine SAND; some low plastic fines.									
85	9																	
84	10		2	11						100								
83	11			17	43									12.3	106.3	27		
				26														
82	12																	
81	13		3	20						100								
				23	61				Poorly-graded SAND with SILT (SP-SM); orangish brown; moist; mostly medium to fine SAND; few non to low plastic fines.									GS
80	14			38												7		
79	15																	
			4	11						94								CR
78	16			15	35													
				20										11.1	106.0			phi = 33.0 degrees, C = 150 psf

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: A-25-004
ENTRY BY: CZ
CHECKED BY: CT

ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD	CASING DEPTH	REMARKS
77	17								Poorly-graded SAND with SILT (SP-SM); orangish brown; moist; mostly medium to fine SAND; few non to low plastic fines.										
76	18		5	11 15 20	35				SILTY SAND (SM); orangish brown; moist; mostly medium to fine SAND; little non to low plastic fines. Wet; orangish gray.	67						19			
75	19																		
74	20		6	9 22 29	51					94									
73	21								Poorly-graded SAND with SILT (SP-SM); gray; wet; mostly medium to fine SAND; few low plastic fines.					20.2	104.3	9			
72	22																		
71	23		7	13 31 49	80					100				22.6	102.2	9			GS
70	24																		
69	25		8	18 33 41	74					100									
68	26								Well-graded SAND with GRAVEL (SW); gray; wet; mostly fine SAND; little fine GRAVEL; trace non plastic fines.										
67	27																		
66	28		9	18 38 47	85				Mostly medium to coarse SAND; few fine GRAVEL; few non plastic fines.	72									
65	29																		
64	30		10	27 50/5	50/5					61									
63	31																		
									Bottom of borehole at 31.5 ft bgs										
62	32																		
61	33																		
60	34																		
59	35																		
58	36																		

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: A-25-004
ENTRY BY: CZ
CHECKED BY: CT

LOG OF BORING R-25-005

PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: RLM
DEPTH OF BORING: 31.5 (ft)

BEGIN DATE: 10/15/2025
COMPLETION DATE: 12/16/2025
SURFACE ELEVATION: 34.0 (ft)
SURFACE CONDITION: Soil
WATER DEPTH: 10.0 ft
READING TAKEN: 10/15/25
HAMMER EFFICIENCY: 81 (%)

DRILLING CONTRACTOR: Taber Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: CME 55 Crawler Drill
HAMMER TYPE: Automatic; 140 (lbs); 30 (in) drop
SAMPLER TYPE & SIZE: MCAL (2.4" ID), Bulk
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)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
33	1		Bulk						GRAVELLY lean CLAY with SAND (CL); brown and orange; moist; mostly medium plastic fines; some medium to coarse SAND; little fine GRAVEL.	100								
32	2																	
31	3																	
30	4																	
29	5		1	4 6 10	16					83								
28	6								CLAYEY SAND with GRAVEL (SC); reddish orange; wet; mostly medium SAND; little low plastic fines; little fine GRAVEL.									
27	7																	
26	8																	
25	9																	
24	10	▽	2	7 6 10	16	2.00	0.80			33								Mud-Rotary after 10 feet.
23	11																	
22	12								CLAYEY SAND (SC); gray; moist; mostly fine SAND; some low plastic fines.									
21	13		3	4 5 6	11					0								
20	14																	
19	15		4	8 9 9	18					67								CR
18	16													46.3	71.8	13		phi = 33.0 degrees, C = 342 psf

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: R-25-005
ENTRY BY: CZ
CHECKED BY: CT

ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	LABORATORY: PLASTICITY INDEX	LABORATORY: LIQUID LIMIT	LABORATORY: MOISTURE (%)	LABORATORY: D. DENSITY (PCF)	LABORATORY: % PASSING 200 SIEVE	DRILL METHOD	CASING DEPTH	REMARKS
17	17								CLAYEY SAND (SC); gray; moist; mostly fine SAND; some low plastic fines.										
16	18		5	11 12 17	29				Fine SAND.	61				20.7					
15	19																		
14	20		6	9 15 19	34				Mostly fine SAND.	61				22.6	104.4	35			GS
13	21																		
12	22																		
11	23		7	11 13 12	25	2.75	0.34		Lean CLAY (CL); gray; wet; mostly medium plastic fines; trace fine SAND.	83		0	0	25.6	100.3				
10	24																		
9	25		8	8 11 13	24	1.50	0.65			100									
8	26																		
7	27		9	8 10 13	23	1.25	0.15			100									UC = 2,246 psf
6	28																		
5	29																		
4	30		10	9 12 18	30	3.25	0.40		Few fine SAND.	100									
3	31																		
2	32								Bottom of borehole at 31.5 ft bgs										
1	33																		
0	34																		
-1	35																		
-2	36																		

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: R-25-005
ENTRY BY: CZ
CHECKED BY: CT

LOG OF BORING R-25-006

PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
LOCATION: Mckinleyville, CA
COUNTY: Humboldt
CLIENT: GHD, Inc.
LOGGED BY: RLM
DEPTH OF BORING: 51.5 (ft)

BEGIN DATE: 10/15/2025
COMPLETION DATE: 12/16/2025
SURFACE ELEVATION: 31.0 (ft)
SURFACE CONDITION: Soil
WATER DEPTH: 22.0 ft
READING TAKEN: 10/15/25
HAMMER EFFICIENCY: 81 (%)

DRILLING CONTRACTOR: Taber Drilling
DRILLING METHOD: Solid-Stem Auger
DRILL RIG: CME 55 Crawler Drill
HAMMER TYPE: Automatic; 140 (lbs); 30 (in) drop
SAMPLER TYPE & SIZE: MCAL (2.4" ID), SPT (1.4" ID), Bulk
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)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD / CASING DEPTH	REMARKS
30	1		Bulk						CLAYEY SAND (SC); yellow and orange; dry; mostly fine SAND; little low plastic fines.	100								
29	2																	
28	3																	
27	4																	
26	5		1	6 9 9	18					94								
25	6								Lean CLAY with SAND (CL); gray and brown; moist; mostly medium plastic fines.									
24	7																	
23	8																	
22	9																	
21	10		2	9 7 10	17	4.00	0.35			67		0	0					
20	11								Lean CLAY (CL); gray; moist; mostly medium plastic fines; few fine SAND.									
19	12																	
18	13		3	9 7 9	16	4.25	0.34			100								UC = 3,931 psf
17	14																	
16	15																	
15	16		4	7 14 18	32	+4.5	0.65		Trace fine SAND.	67				21.7	102.3			CR

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: R-25-006
ENTRY BY: CZ
CHECKED BY: CT

ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD	CASING DEPTH	REMARKS
									Lean CLAY (CL); gray; moist; mostly medium plastic fines; few fine SAND.										
14	17																		
			5	9						100									
13	18			12	25														
				13		4.00	0.41					3	26	24.3	101.8				
12	19																		
11	20		6	11					Gray; moist; mostly trace fines.	94									
				10	23														
10	21			13		3.50	0.85												UC = 5,674 psf
9	22																		
									CLAYEY SAND (SC); orangish brown; moist; mostly medium to fine SAND; little low plastic fines; few coarse to fine GRAVEL.										
8	23		7	19						100									
				29	69														
7	24			40										20.8	108.3	35			
6	25		8	26	50					100									Mud-Rotary after 25 feet.
				50/3										18.3	110.1	15			GS
5	26																		
4	27																		
			9	50/4	REF					0									
3	28																		
2	29																		
1	30		10	29						56									
				30	76														
0	31			46															
-1	32																		
			11	49						89									
-2	33			46	96									11.0					
				50/6															
-3	34																		
-4	35		12	46	50				Few coarse GRAVEL.	67									
				50/3															
-5	36																		

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PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: R-25-006
ENTRY BY: CZ
CHECKED BY: CT

ELEVATION (ft)	DEPTH (ft)	FIELD: SAMPLE	SAMPLE NO	BLOWS PER 6 IN.	BLOWS PER FOOT	POCKET PEN. (TSF)	TORVANE (TSF)	GRAPHIC LOG	DESCRIPTION	RECOVERY(%)	RQD (%)	LABORATORY: PLASTICITY INDEX	LIQUID LIMIT	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	DRILL METHOD	CASING DEPTH	REMARKS
-6	37								CLAYEY SAND (SC); orangish brown; moist; mostly medium to fine SAND; little low plastic fines; few coarse to fine GRAVEL.										
-7	38																		
-8	39																		
-9	40		13	34	50					100									
				50/6															
-10	41																		
-11	42																		
-12	43																		
-13	44																		
-14	45		14	50/5.5	50					55				12.9					
-15	46																		
-16	47																		
-17	48																		
-18	49																		
-19	50		15	11	32					78									
-20	51			13															
				19															
-21	52								Bottom of borehole at 51.5 ft bgs										
-22	53																		
-23	54																		
-24	55																		
-25	56																		

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Crawford & Associates, Inc.
4701 Freeport Blvd
Sacramento, CA 95822
(916) 455-4225

PROJECT NO: 20-640.3
PROJECT: MCSD Highway Sewer Crossings
BORING: R-25-006
ENTRY BY: CZ
CHECKED BY: CT

Appendix C

Laboratory Test Results

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No.: 20-640.3 Sampled By: RLM
Technician: SLC Sample 10/15/25
Test Date: 12/5/25

MOISTURE-DENSITY TESTS - D2216/D7263

	1	2	3	4	5
Sample No.	A-25-001 3A	A-25-002 2A	A-25-002 3A	A-25-002 5A	A-25-002 6A
USCS Symbol	SC	SM	SC	SM	SW
Depth (ft.)	11.5-12.0	6.0-6.5	8.5-9.0	13.5-14.0	16.0-16.5
Sample Length (in.)	4.460	5.920	5.760	6.000	5.490
Diameter (in.)	2.400	2.400	2.400	2.400	2.400
Sample Volume (ft^3)	0.01168	0.01550	0.01508	0.01571	0.01437
Total Mass Soil+Tube (g)	855.8	936.5	929.5	1120.1	1046.4
Mass of Tube (g)	221.2	217.0	218.1	217.3	218.4
Tare No.	0.0	0.0	0.0	0.0	0.0
Tare (g)	833.0	534.4	233.2	229.5	154.1
Wet Soil + Tare (g)	1467.6	1253.9	944.6	1132.3	982.1
Dry Soil + Tare (g)	1347.8	1197.5	878.0	955.2	828.0
Dry Soil (g)	514.8	663.1	644.8	725.7	673.9
Water (g)	119.8	56.4	66.6	177.1	154.1
Moisture (%)	**23.3**	**8.5**	**10.3**	**24.4**	**22.9**
Wet Density (pcf)	**119.8**	**102.3**	**104.0**	**126.7**	**127.0**
Dry Density (pcf)	**97.2**	**94.3**	**94.3**	**101.9**	**103.4**

Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No.: 20-640.3 Sampled By: RLM
Technician: SLC Sample 10/15/25
Test Date: 12/5/25

MOISTURE-DENSITY TESTS - D2216/D7263

	1	2	3	4	5
Sample No.	A-25-002 8A	A-25-002 10A	A-25-003 1A	A-25-003 3A	A-25-003 4A
USCS Symbol	SW	CL	SM	SP-SM	SP-SM
Depth (ft.)	21.0-21.5	26.0-26.5	6.0-6.5	11.0-11.5	13.5-14.0
Sample Length (in.)	5.490	5.020	5.530	6.000	5.920
Diameter (in.)	2.400	2.400	2.400	2.400	2.400
Sample Volume (ft^3)	0.01437	0.01314	0.01448	0.01571	0.01550
Total Mass Soil+Tube (g)	1048.8	984.1	902.8	1041.0	1084.0
Mass of Tube (g)	218.6	218.2	247.8	250.1	248.3
Tare No.	0.0	0.0	0.0	0.0	0.0
Tare (g)	154.1	537.3	153.8	169.5	741.3
Wet Soil + Tare (g)	984.3	1303.2	808.8	1185.4	1577.0
Dry Soil + Tare (g)	835.3	1163.3	763.8	882.2	1473.2
Dry Soil (g)	681.2	626.0	610.0	712.7	731.9
Water (g)	149.0	139.9	45.0	303.2	103.8
Moisture (%)	**21.9**	**22.3**	**7.4**	**42.5**	**14.2**
Wet Density (pcf)	**127.3**	**128.5**	**99.7**	**111.0**	**118.9**
Dry Density (pcf)	**104.5**	**105.0**	**92.9**	**77.9**	**104.1**

Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No.: 20-640.3 Technician: SLC
Sampled By: RLM Test Date: 12/5/25
Sample Date: 10/15/25

MOISTURE-DENSITY TESTS - D2216/D7263

	1	2	3	4	5
Sample No.	A-25-003 5A	A-25-003 6A	A-25-004 2A	A-25-004 6A	A-25-004 7B
USCS Symbol	SC	SC	SM	SP-SM	SP-SM
Depth (ft.)	16.0-16.5	18.5-19.0	11.0-11.5	21.0-21.5	23.0-23.5
Sample Length (in.)	5.680	5.800	5.960	4.390	5.250
Diameter (in.)	2.400	2.400	2.400	2.400	2.400
Sample Volume (ft^3)	0.01487	0.01518	0.01560	0.01149	0.01374
Total Mass Soil+Tube (g)	1082.2	1134.7	1087.1	900.5	1023.1
Mass of Tube (g)	248.1	251.5	242.3	247.2	241.7
Tare No.	0.0	0.0	0.0	0.0	0.0
Tare (g)	171.1	745.8	745.8	531.1	543.4
Wet Soil + Tare (g)	1005.2	1629.0	1590.6	1184.4	1324.8
Dry Soil + Tare (g)	868.6	1494.1	1498.4	1074.8	1180.6
Dry Soil (g)	697.5	748.3	752.6	543.7	637.2
Water (g)	136.6	134.9	92.2	109.6	144.2
Moisture (%)	**19.6**	**18.0**	**12.3**	**20.2**	**22.6**
Wet Density (pcf)	**123.7**	**128.2**	**119.4**	**125.3**	**125.3**
Dry Density (pcf)	**103.4**	**108.6**	**106.3**	**104.3**	**102.2**

Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No.: 20-640.3 Sampled By: RLM
Technician: SLC Sample 10/15/25
Test Date: 12/5/25

MOISTURE-DENSITY TESTS - D2216/D7263

	1	2	3	4	5
Sample No.	A-25-005 6A	A-25-006 4A	A-25-006 5A	A-25-006 7A	A-25-006 8B
USCS Symbol	SC	CL-ML	CL-ML	SC	SC
Depth (ft.)	21.0-21.5	16.0-16.5	18.5-19.0	23.5-24.0	25.5-26.0
Sample Length (in.)	5.130	5.900	5.530	5.760	4.940
Diameter (in.)	2.400	2.400	2.400	2.400	2.400
Sample Volume (ft^3)	0.01343	0.01545	0.01448	0.01508	0.01293
Total Mass Soil+Tube (g)	998.5	1090.4	1050.0	1112.3	1041.1
Mass of Tube (g)	219.2	218.4	218.5	216.9	277.3
Tare No.	0.0	0.0	0.0	0.0	0.0
Tare (g)	738.6	745.9	742.0	835.5	744.4
Wet Soil + Tare (g)	1517.9	1617.9	1573.5	1730.9	1508.2
Dry Soil + Tare (g)	1374.4	1462.6	1410.7	1576.6	1390.0
Dry Soil (g)	635.8	716.7	668.7	741.1	645.6
Water (g)	143.5	155.3	162.8	154.3	118.2
Moisture (%)	**22.6**	**21.7**	**24.3**	**20.8**	**18.3**
Wet Density (pcf)	**127.9**	**124.5**	**126.6**	**130.9**	**130.2**
Dry Density (pcf)	**104.4**	**102.3**	**101.8**	**108.3**	**110.1**

Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No.: 20-640.3 Technician: K. Joyce
Sampled By: RLM Test Date: 12/17/25
Sample Date: 10/15/25

MOISTURE-DENSITY TESTS - D2216/D7263

	1	2	3	4	5
Sample No.	A-25-005 7B				
USCS Symbol	CL				
Depth (ft.)	23.5-24.0				
Sample Length (in.)	5.250				
Diameter (in.)	2.400				
Sample Volume (ft^3)	0.01374				
Total Mass Soil+Tube (g)	1003.8				
Mass of Tube (g)	218.0				
Tare No.	0.0				
Tare (g)	746.1				
Wet Soil + Tare (g)	1531.9				
Dry Soil + Tare (g)	1371.7				
Dry Soil (g)	625.6				
Water (g)	160.2				
Moisture (%)	**25.6**				
Wet Density (pcf)	**126.0**				
Dry Density (pcf)	**100.3**				

Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name:	MCSD Highway Sewer Crossing	Sampled By:	RLM
Crawford File No.:	20-640.3	Sample Date:	10/15/25
Technician:	KJ		
Test Date:	12/15/25		

MOISTURE CONTENT OF SOILS/AGGREGATE

	1	2	3	4	5
Sample No.	A-25-005 5A	A-25-006 11	A-25-006 14		
USCS Symbol	SC	SC	SC		
Depth (ft.)	18.5-19.0	32.5-34.0	45.0-45.5		
Tare No.	0.0	0.0	0.0		
Tare (g)	745.9	745.8	835.6		
Wet Soil + Tare (g)	900.8	1695.5	1029.7		
Dry Soil + Tare (g)	874.2	1601.1	1007.5		
Dry Soil (g)	128.3	855.3	171.9		
Water (g)	26.6	94.4	22.2		
Moisture (%)	**20.7**	**11.0**	**12.9**		

Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No.: 20-640.3 Sampled By: RLM
Technician: SLC Sample Date: 10/15/25
Test Date: 12/5/25

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-25-001 3A	A-25-002 2C	A-25-002 6B	A-25-002 10A	A-25-006 7A
USCS Symbol	SC	SM	SW	CL	SC
Depth (ft.)	11.5-12.0	5.0-5.5	15.5-16.0	26.0-26.5	23.5-24.0
Tare No.					
Tare (g)	182.4	175.6	182.3	175.5	33.8
Dry Soil + Tare (g)	280.9	291	271.7	203.6	69.8
Dry Mass before (g)	98.5	115.4	89.4	28.1	36.0
Dry Mass after (g)	85.6	87.0	86.1	5.6	23.4
Percent Fines (%)	13	25	4	80	35

Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No.: 20-640.3 Sampled By: RLM
Technician: SLC Sample Date: 10/15/25
Test Date: 12/5/25

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

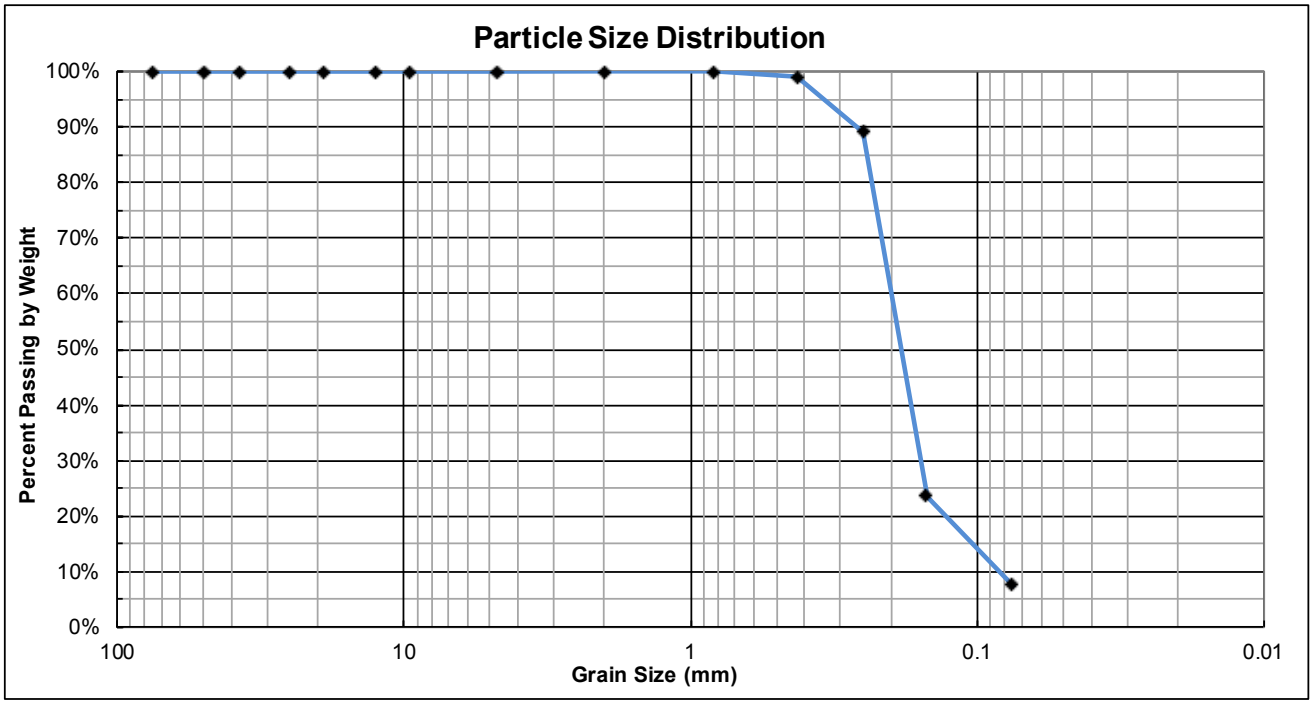
Sample No.	A-25-003 5C	A-25-004 6A	A-25-004 2C	A-25-004 5B	A-25-005 4B
USCS Symbol	SC	SP-SM	SM	SM	SC
Depth (ft.)	15.0-15.5	21.0-21.5	10.0-10.5	18.0-18.5	15.5-16.0
Tare No.					
Tare (g)	33.9	33.9	835.6	832.9	34.1
Dry Soil + Tare (g)	70	84.9	875	884.8	123.1
Dry Mass before (g)	36.1	51.0	39.4	51.9	89.0
Dry Mass after (g)	30.5	46.4	28.8	42.1	77.8
Percent Fines (%)	16	9	27	19	13

Notes:

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/11/25
Technician: K. Joyce
Sample ID: A-25-004 3A
Depth (ft): 13.5-14.0
USCS Classification: SP-SM

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	0	0	0	1	92	
0	**0**		**93**			**7**

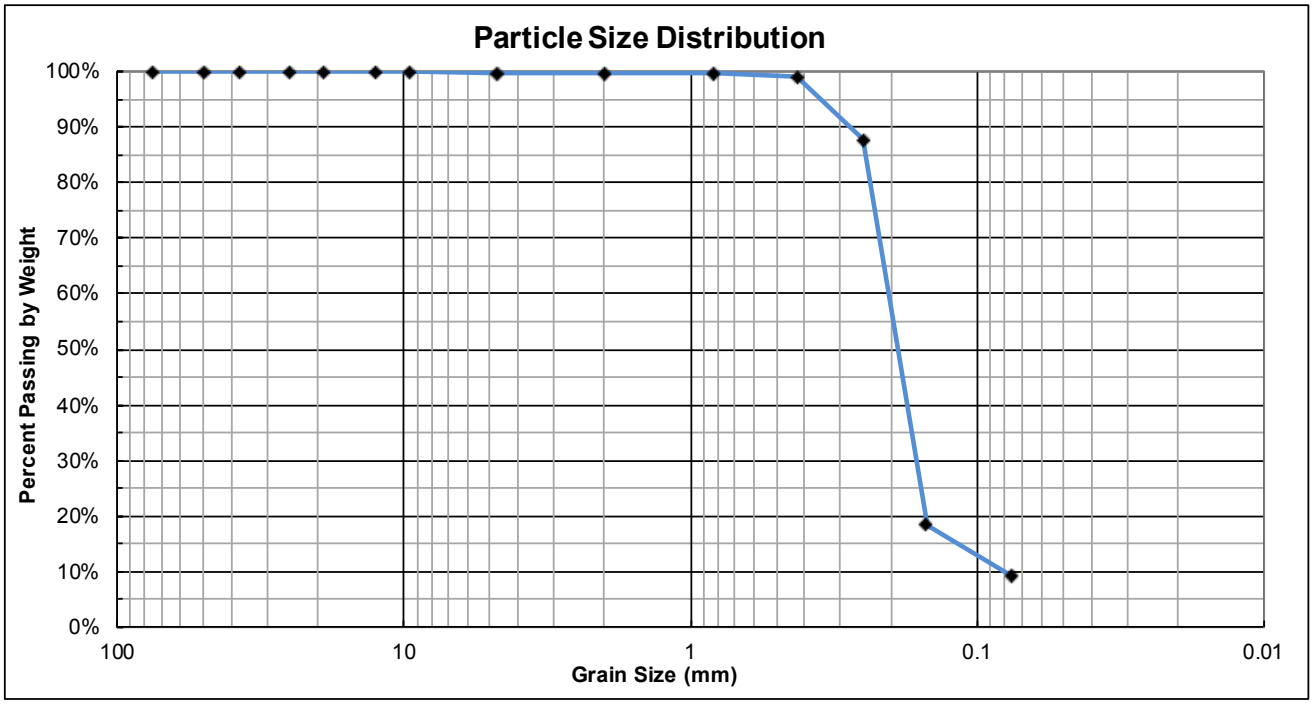
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	0.0	100%
	Fine	**1/2"**	12.5	0.0	100%
		3/8"	9.50	0.0	100%
		#4	4.75	0.0	100%
Sand	Coarse	**#10**	2.00	0.1	100%
	Medium	**#20**	0.825	0.1	100%
		#40	0.425	7.8	99%
	Fine	**#60**	0.250	83.4	89%
		#100	0.150	585.2	24%
Silt/Clay		**#200**	0.075	708.1	7%

Coefficient of Uniformity	Coefficient of Curvature
Cu = 2.4	Cc = 1.4

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/11/25
Technician: K. Joyce
Sample ID: A-25-004 7A
Depth (ft): 23.5-24.0
USCS Classification: SP-SM

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	0	0	0	1	90	
0	**0**		**91**			**9**

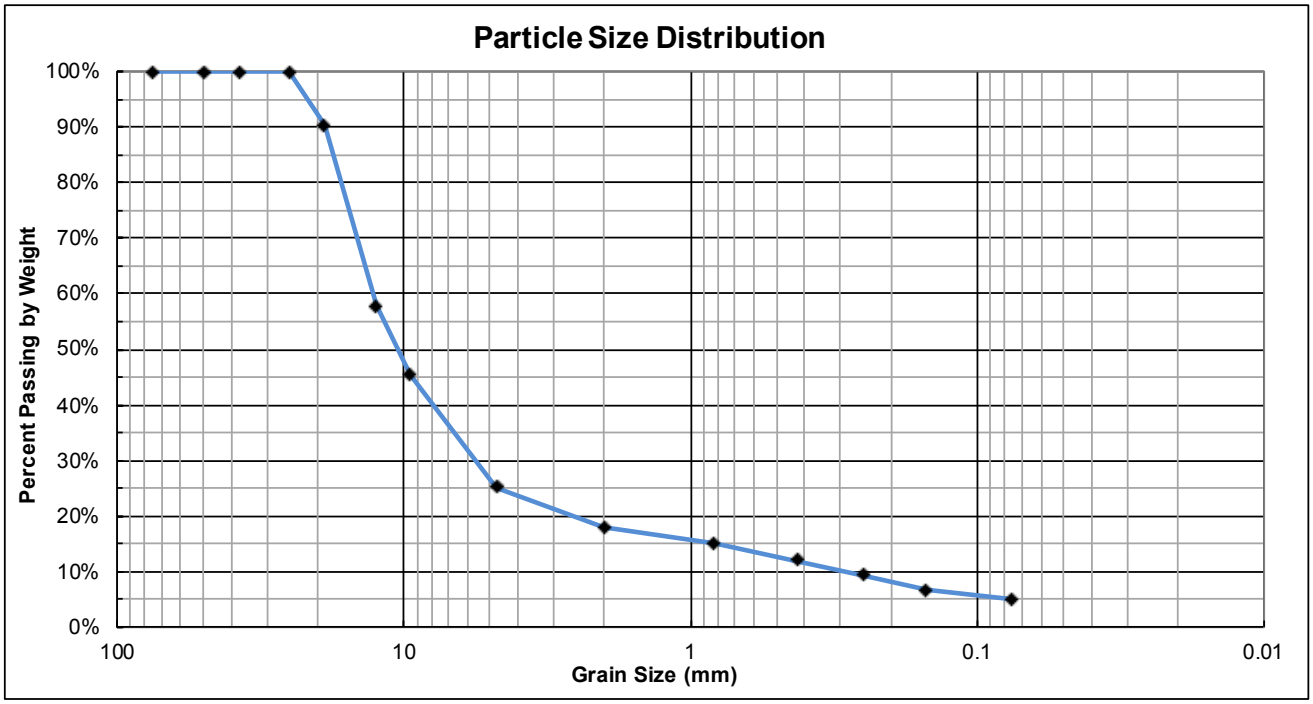
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	0.0	100%
	Fine	**1/2"**	12.5	0.0	100%
		3/8"	9.50	0.0	100%
		#4	4.75	2.0	100%
Sand	Coarse	**#10**	2.00	2.3	100%
	Medium	**#20**	0.825	2.5	100%
		#40	0.425	6.2	99%
	Fine	**#60**	0.250	72.0	88%
		#100	0.150	478.2	18%
Silt/Clay		**#200**	0.075	533.2	9%

Coefficient of Uniformity	Coefficient of Curvature
Cu = 2.6	Cc = 1.6

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/17/25
Technician: K. Joyce
Sample ID: A-25-001 Bulk
Depth (ft): 0.0-5.0
USCS Classification: GP

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	10	65	7	6	7	
0	**75**		**20**			**5**

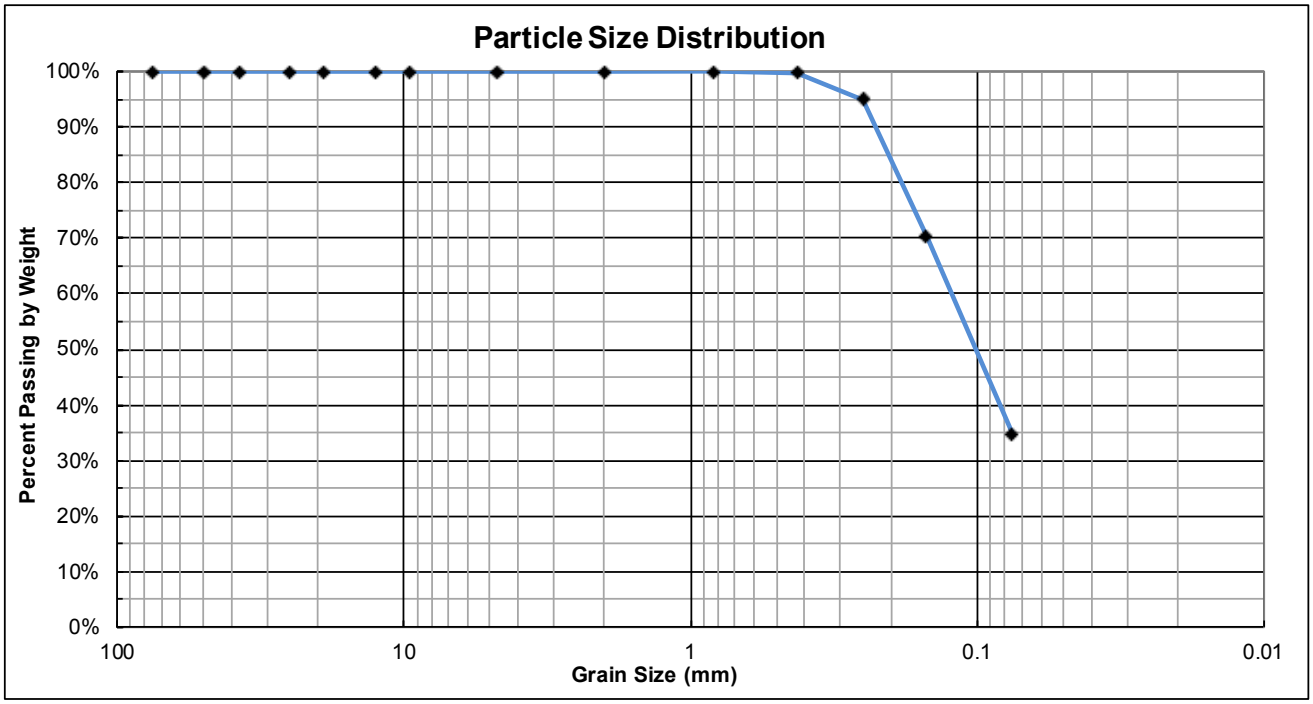
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	67.7	90%
	Fine	**1/2"**	12.5	296.7	58%
		3/8"	9.50	384.1	45%
		#4	4.75	526.1	25%
Sand	Coarse	**#10**	2.00	577.0	18%
	Medium	**#20**	0.825	597.5	15%
		#40	0.425	619.2	12%
	Fine	**#60**	0.250	636.6	9%
		#100	0.150	656.0	7%
Silt/Clay		**#200**	0.075	667.7	5%

Coefficient of Uniformity	Coefficient of Curvature
Cu = 44.9	Cc = 9.3

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/11/25
Technician: K. Joyce
Sample ID: A-25-005 6A
Depth (ft): 21.0-21.5
USCS Classification: SC

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	0	0	0	0	65	
0	**0**		**65**			**35**

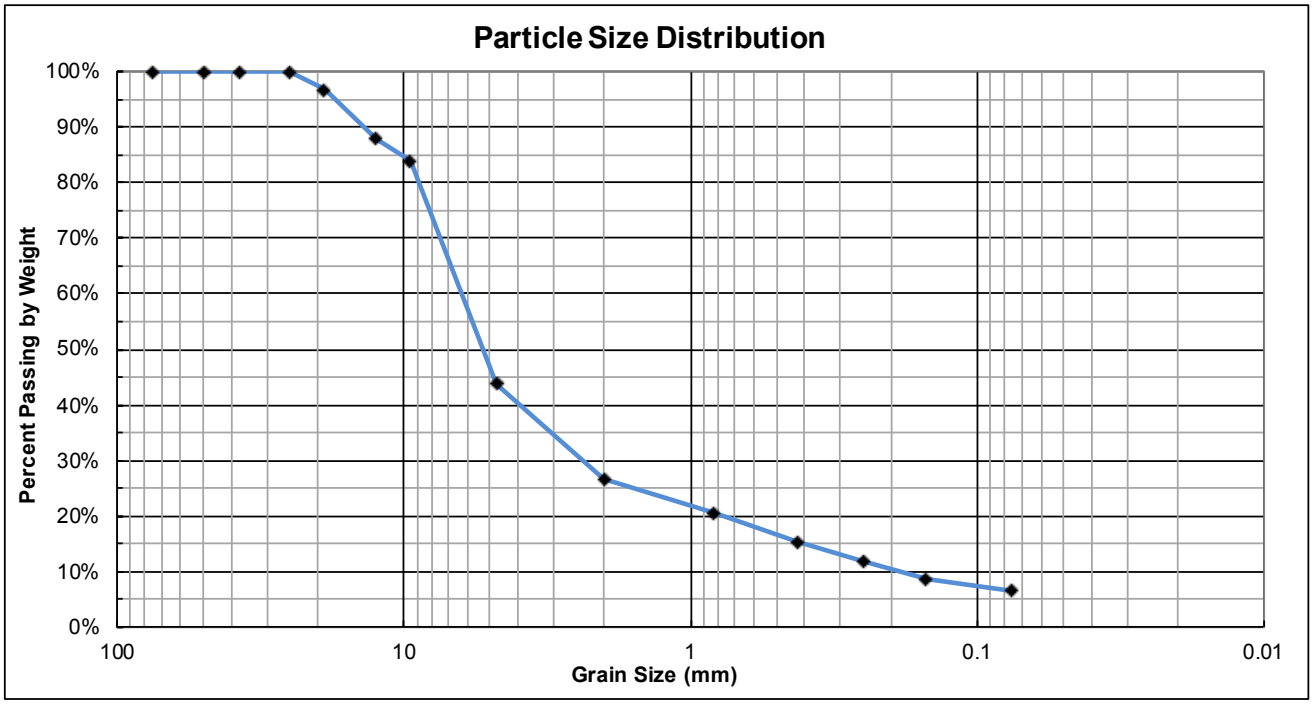
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	0.0	100%
	Fine	**1/2"**	12.5	0.0	100%
		3/8"	9.50	0.0	100%
		#4	4.75	0.0	100%
Sand	Coarse	**#10**	2.00	0.0	100%
	Medium	**#20**	0.825	0.1	100%
		#40	0.425	1.5	100%
	Fine	**#60**	0.250	31.6	95%
		#100	0.150	189.0	70%
Silt/Clay		**#200**	0.075	416.0	35%

Coefficient of Uniformity	Coefficient of Curvature
Cu = NA	Cc = NA

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/11/25
Technician: K. Joyce
Sample ID: A-25-001 1C
Depth (ft): 5.0-5.5
USCS Classification: GP

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	3	53	17	12	8	
0	**56**		**37**			**7**

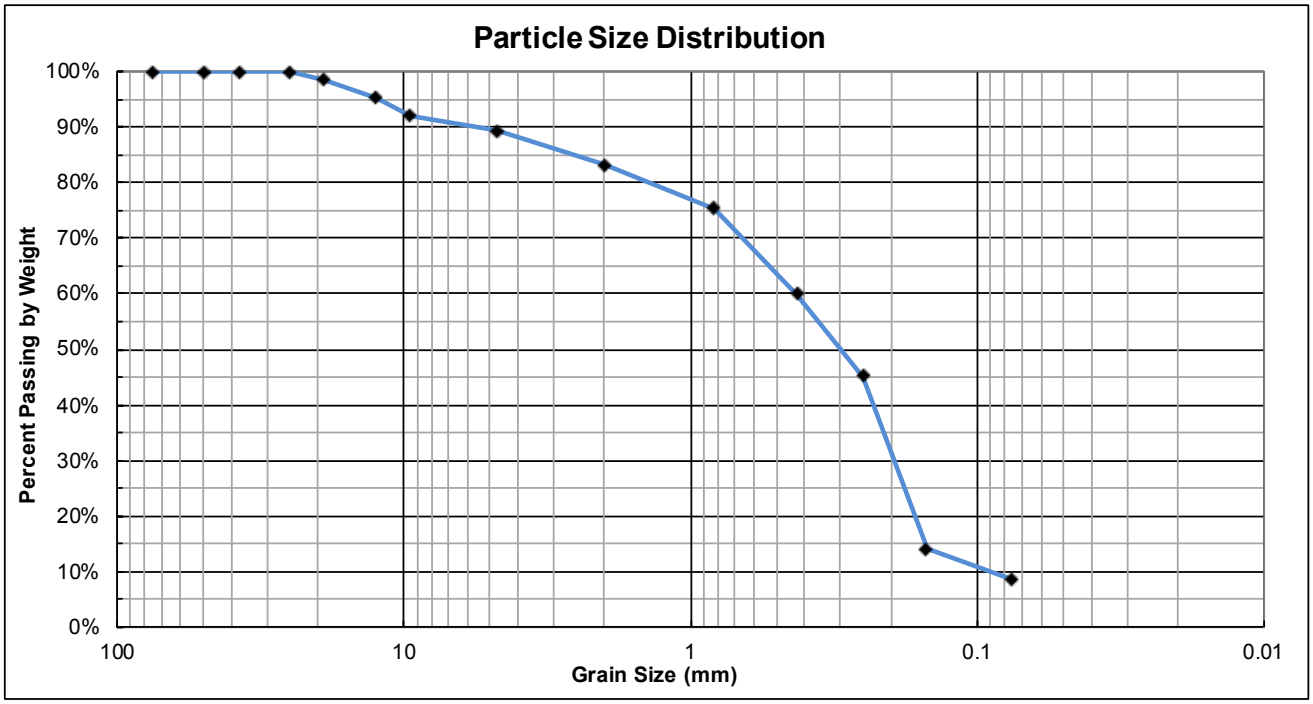
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	17.3	97%
	Fine	**1/2"**	12.5	65.9	88%
		3/8"	9.50	87.2	84%
		#4	4.75	304.8	44%
Sand	Coarse	**#10**	2.00	398.8	27%
	Medium	**#20**	0.825	432.0	20%
		#40	0.425	460.0	15%
	Fine	**#60**	0.250	478.7	12%
		#100	0.150	496.4	9%
Silt/Clay		**#200**	0.075	507.6	7%

Coefficient of Uniformity	Coefficient of Curvature
Cu = 34.4	Cc = 5.0

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/11/25
Technician: K. Joyce
Sample ID: A-25-003 8B
Depth (ft): 23.0-23.5
USCS Classification: SP-SC

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	1	10	6	23	51	
0	**11**		**80**			**9**

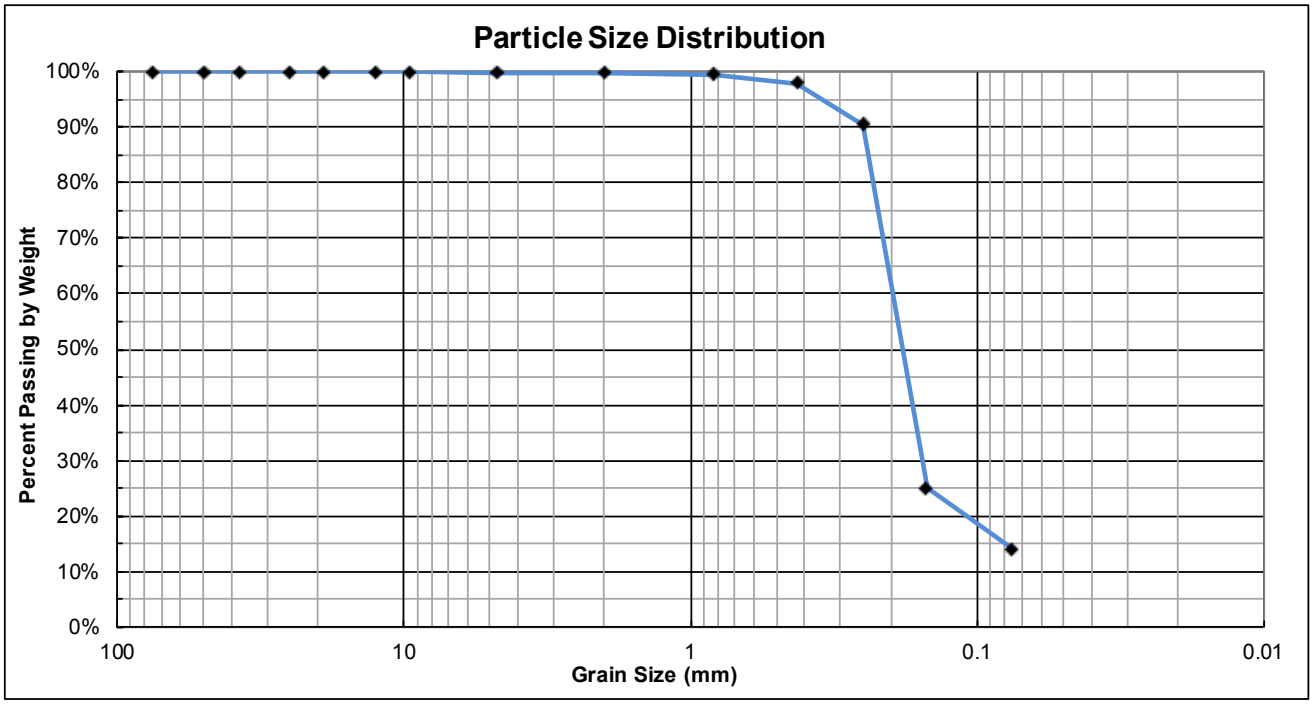
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	11.0	99%
	Fine	**1/2"**	12.5	35.0	95%
		3/8"	9.50	59.1	92%
		#4	4.75	79.8	89%
Sand	Coarse	**#10**	2.00	125.6	83%
	Medium	**#20**	0.825	185.1	75%
		#40	0.425	300.3	60%
	Fine	**#60**	0.250	412.0	45%
		#100	0.150	644.5	14%
Silt/Clay		**#200**	0.075	686.0	9%

Coefficient of Uniformity	Coefficient of Curvature
Cu = 4.5	Cc = 1.0

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/11/25
Technician: K. Joyce
Sample ID: A-25-003 1B
Depth (ft): 5.5-6.0
USCS Classification: SM

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	0	0	0	2	84	
0	**0**		**86**			**14**

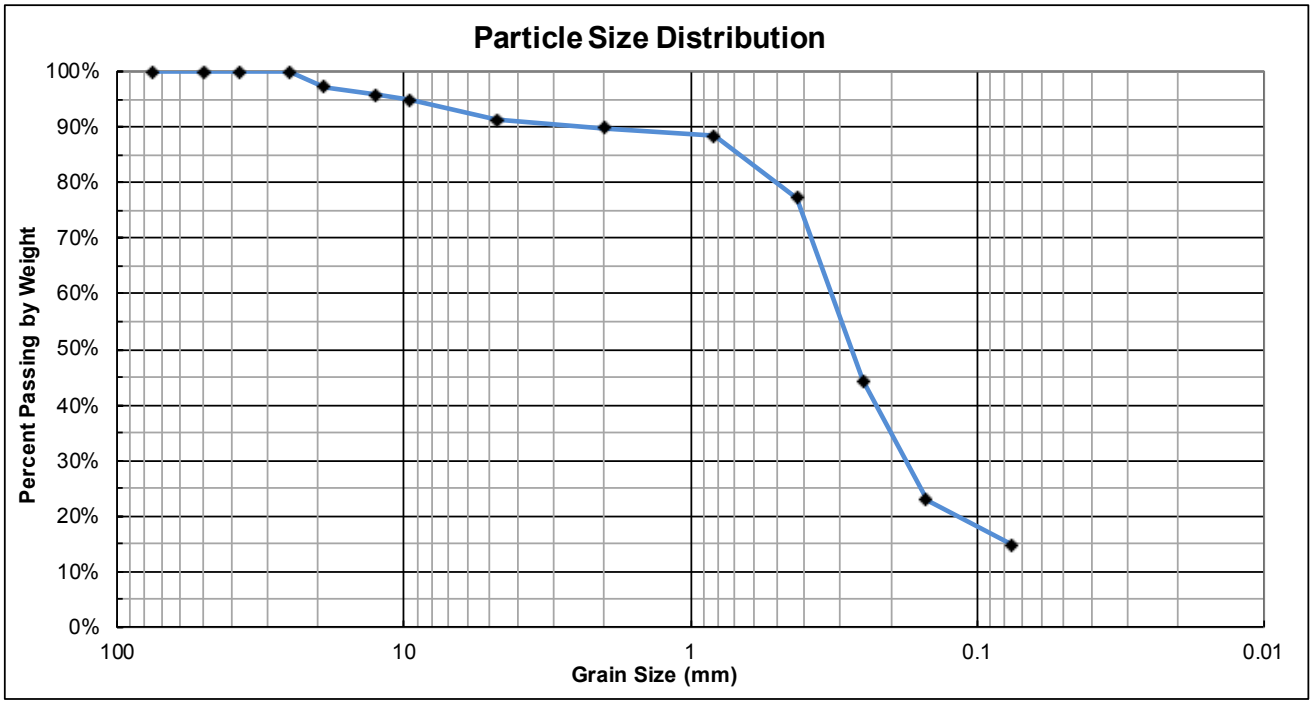
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	0.0	100%
	Fine	**1/2"**	12.5	0.0	100%
		3/8"	9.50	0.0	100%
		#4	4.75	0.8	100%
Sand	Coarse	**#10**	2.00	1.0	100%
	Medium	**#20**	0.825	3.1	99%
		#40	0.425	12.2	98%
	Fine	**#60**	0.250	56.3	90%
		#100	0.150	442.7	25%
Silt/Clay		**#200**	0.075	506.8	14%

Coefficient of Uniformity	Coefficient of Curvature
Cu = NA	Cc = NA

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/11/25
Technician: K. Joyce
Sample ID: A-25-006 8B
Depth (ft): 25.5-25.8
USCS Classification: SC

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	3	6	1	13	62	
0	**9**		**76**			**15**

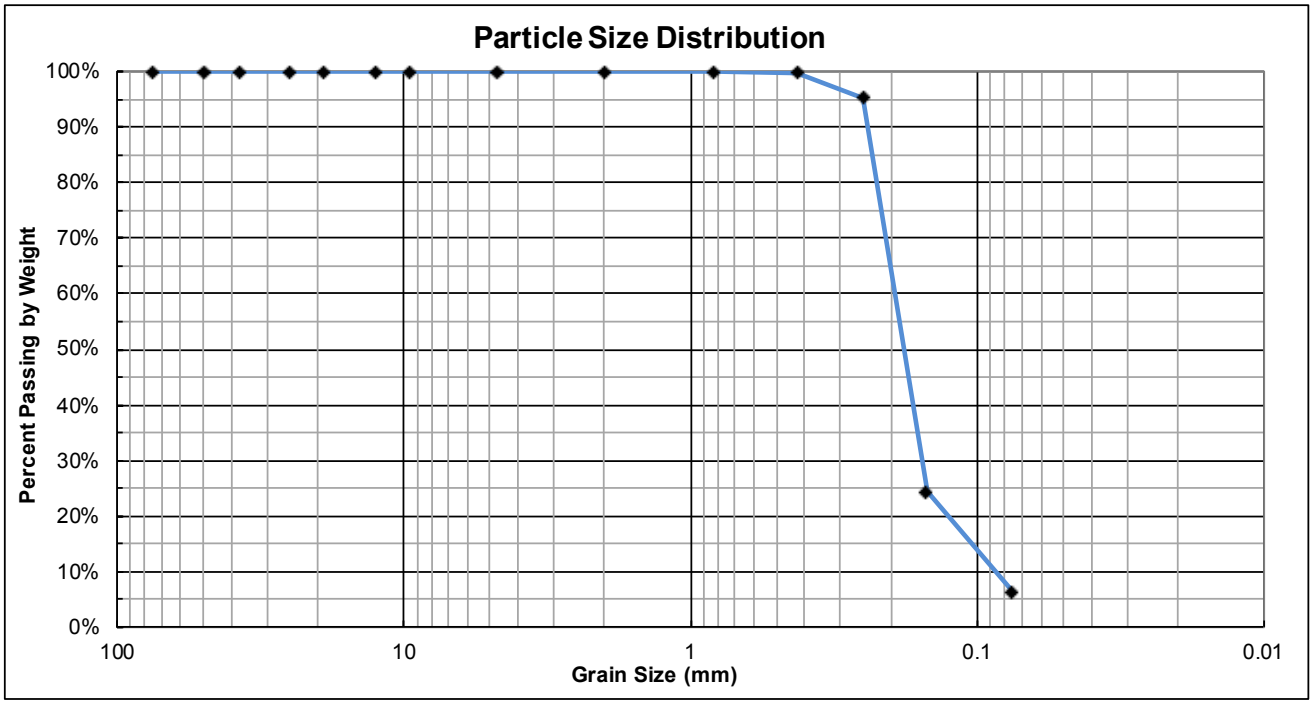
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	18.2	97%
	Fine	**1/2"**	12.5	27.5	96%
		3/8"	9.50	33.7	95%
		#4	4.75	56.7	91%
Sand	Coarse	**#10**	2.00	65.6	90%
	Medium	**#20**	0.825	74.8	88%
		#40	0.425	147.1	77%
	Fine	**#60**	0.250	360.2	44%
		#100	0.150	498.6	23%
Silt/Clay		**#200**	0.075	550.6	15%

Coefficient of Uniformity	Coefficient of Curvature
Cu = NA	Cc = NA

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/11/25
Technician: K. Joyce
Sample ID: A-25-003 4A
Depth (ft): 13.5-14.0
USCS Classification: SP-SM

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	0	0	0	0	94	
0	**0**		**94**			**6**

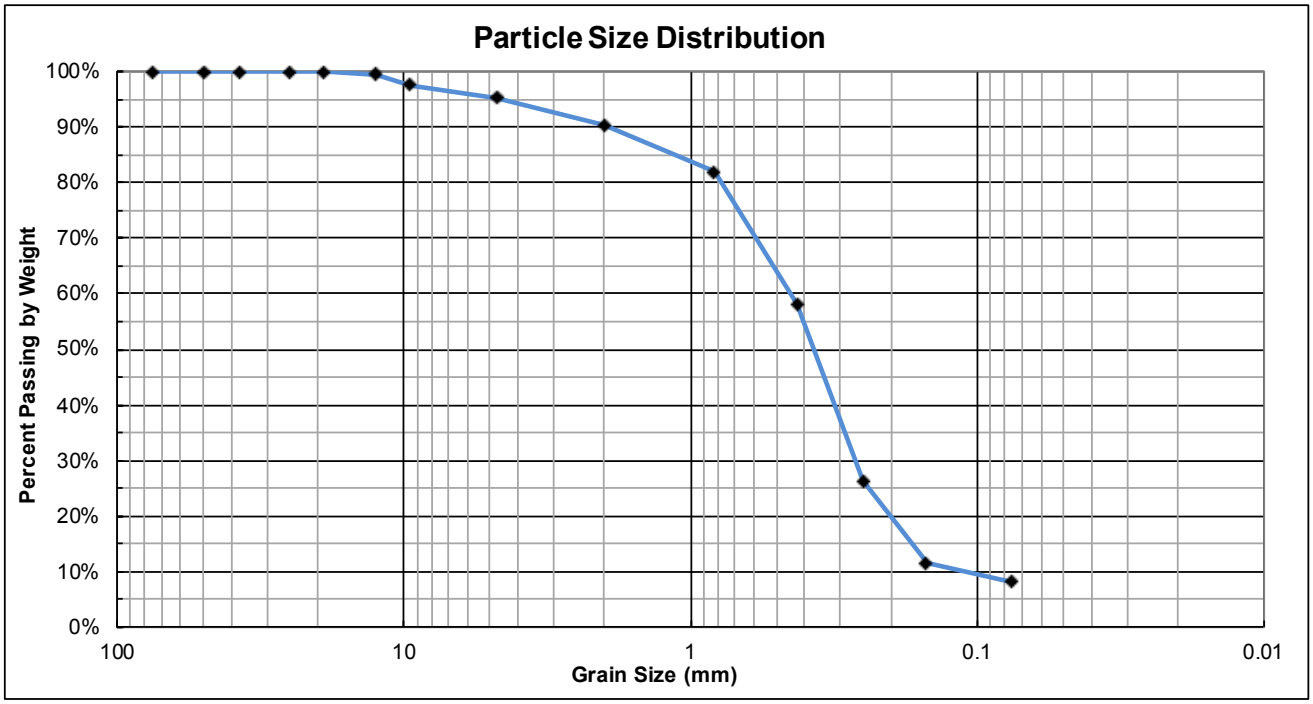
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	0.0	100%
	Fine	**1/2"**	12.5	0.0	100%
		3/8"	9.50	0.0	100%
		#4	4.75	0.0	100%
Sand	Coarse	**#10**	2.00	0.0	100%
	Medium	**#20**	0.825	0.0	100%
		#40	0.425	1.3	100%
	Fine	**#60**	0.250	34.8	95%
		#100	0.150	553.6	24%
Silt/Clay		**#200**	0.075	685.4	6%

Coefficient of Uniformity	Coefficient of Curvature
Cu = 2.2	Cc = 1.4

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/11/25
Technician: K. Joyce
Sample ID: A-25-001 4A
Depth (ft): 13.5-14.0
USCS Classification: SC

ASTM 6913 - Method A



% Cobble	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
	0	5	5	32	50	
0	**5**		**87**			**8**

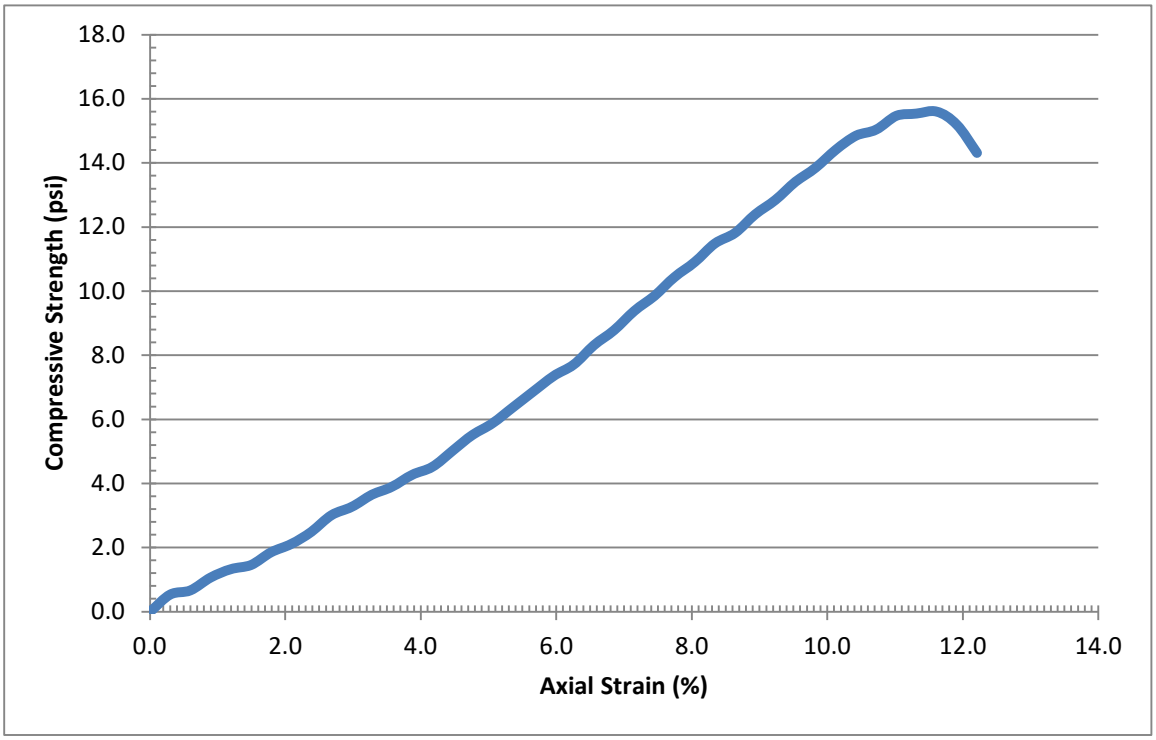
		Sieve #	Opening mm	Cummulative Mass Retained (g	% Passing %
Cobbles		**3"**	75	0.0	100%
Gravel	Coarse	**2"**	50	0.0	100%
		1-1/2"	37.5	0.0	100%
		1"	25.0	0.0	100%
		3/4"	19.0	0.0	100%
	Fine	**1/2"**	12.5	2.8	100%
		3/8"	9.50	15.3	98%
		#4	4.75	29.5	95%
Sand	Coarse	**#10**	2.00	60.6	90%
	Medium	**#20**	0.825	113.0	82%
		#40	0.425	262.6	58%
	Fine	**#60**	0.250	463.5	26%
		#100	0.150	556.2	11%
Silt/Clay		**#200**	0.075	577.4	8%

Coefficient of Uniformity	Coefficient of Curvature
Cu = 3.9	Cc = 1.4

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name:	MCSD Phase 2 Sewer HighwayMCSD Phase 2 Sewer H		
Crawford File No.:	20-640.3	Sampled By:	R. Mather
Boring No.:	A-25-005	Sample Date:	10/15/2025
Sample No.:	8A	Technician:	J. Ortiz
Depth (ft):	28.5-29.0	Test Date:	12/22/2025
Sample Description:	Gray Lean CLAY		

UNCONFINED COMPRESSION TEST - D2166



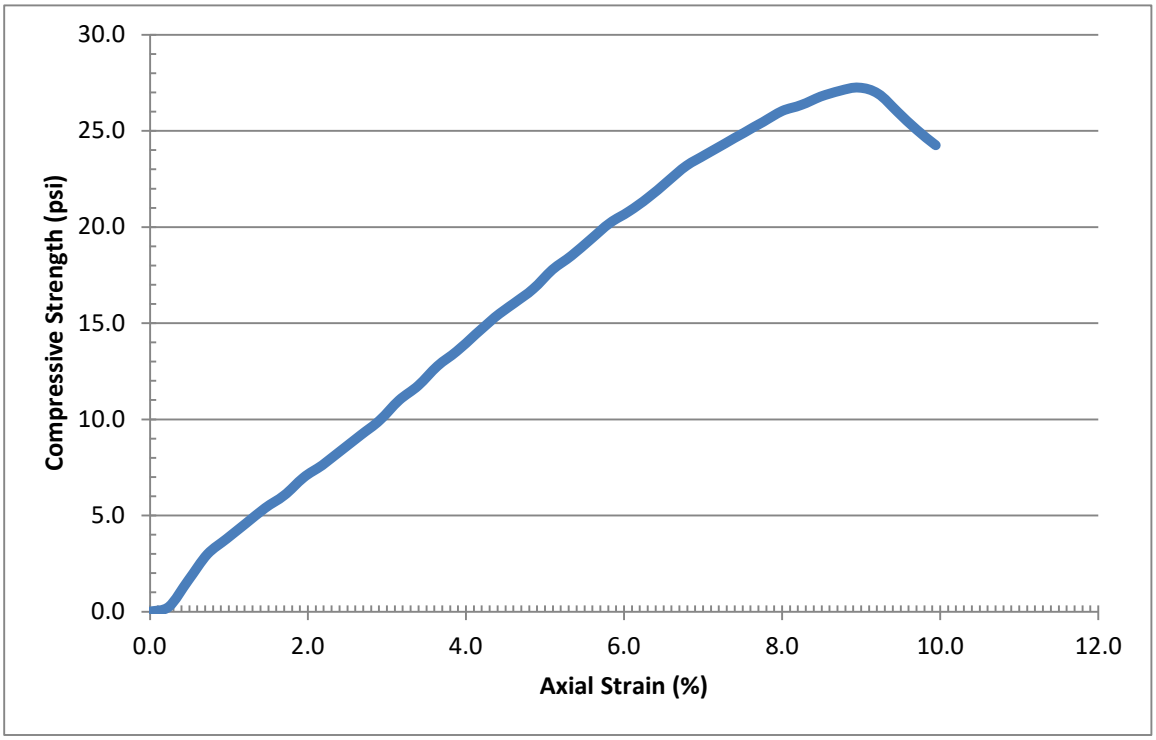
Dry Density (pcf)	**105.2**
Water Content (%)	**24.1**
Unconfined Compressive Strength (psi)	**15.6**
Unconfined Compressive Strength (psf)	**2246**
Average Height (in)	5.068
Average Diameter (in)	2.403
Rate of strain (%)	1.5
Strain at Failure (%)	11.6



Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name:	MCSD Phase 2 Sewer HighwayMCSD Phase 2 Sewer H		
Crawford File No.:	20-640.3	Sampled By:	R. Mather
Boring No.:	A-25-006	Sample Date:	10/15/2025
Sample No.:	3A	Technician:	J. Ortiz
Depth (ft):	13.5-14.0	Test Date:	12/22/2025
Sample Description:	Gray Lean CLAY		

UNCONFINED COMPRESSION TEST - D2166



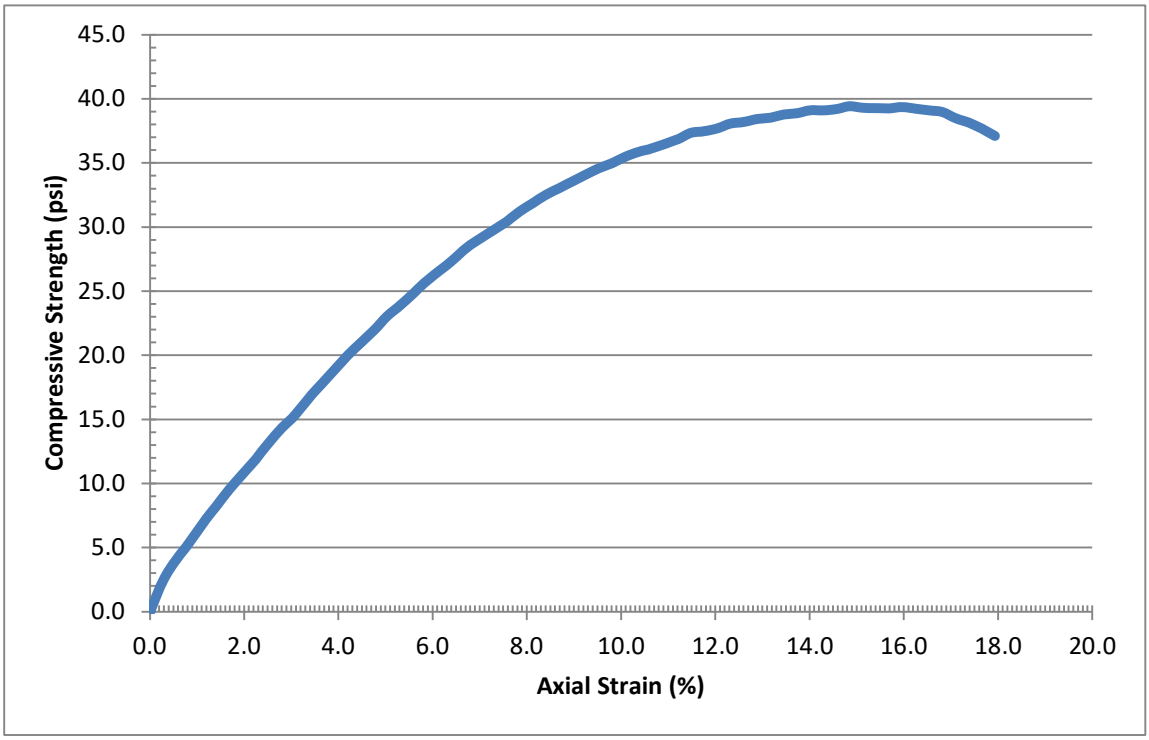
Dry Density (pcf)	**103.0**
Water Content (%)	**25.0**
Unconfined Compressive Strength (psi)	**27.3**
Unconfined Compressive Strength (psf)	**3931**
Average Height (in)	5.603
Average Diameter (in)	2.386
Rate of strain (%)	1.4
Strain at Failure (%)	9.0



Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name:	MCSD Phase 2 Sewer HighwayMCSD Phase 2 Sewer H		
Crawford File No.:	20-640.3	Sampled By:	R. Mather
Boring No.:	A-25-006	Sample Date:	10/15/2025
Sample No.:	6A	Technician:	J. Ortiz
Depth (ft):	21-21.5	Test Date:	12/22/2025
Sample Description:	Gray Lean CLAY		

UNCONFINED COMPRESSION TEST - D2166



Dry Density (pcf)	**99.2**
Water Content (%)	**26.9**
Unconfined Compressive Strength (psi)	**39.4**
Unconfined Compressive Strength (psf)	**5674**
Average Height (in)	5.207
Average Diameter (in)	2.387
Rate of strain (%)	1.5
Strain at Failure (%)	14.9



In-situ Moisture Content and In-situ Density

(ASTM D 2216/ASTM D2937)

	Method A (Water content recorded to ± 1%)
X	Method B (Water content recorded to ± 0.1%)

Date Sampled: 10/14/25

Date Received: 1/6/26

Sample ID	Sample Location		Soil Description'		Wet Density (pcf)	Water Content, %	Dry Density (pcf)
	Boring No.	Depth ft.	USCS Group Symbol (Visual)	Approx. Max Grain Size (Visual)			
1A	A-25-001	6' - 6.5'	GC - SC	3/4 in	125.6	**22.5%**	**102.6**
2A	A-25-001	8.5' - 9.0'	GC - SC	1/2 in	123.5	**28.4%**	**96.1**
5B	A-25-001	15.5' - 16'	SW	1/2 in	139.7	**10.3%**	**126.6**
4A	A-25-002	11' -11.5'	SM	#10	126.5	**19.5%**	**105.9**
5B	A-25-003	15.5' - 16'	SW	#4	124.3	**19.4%**	**104.1**
4A	A-25-004	16' - 16.5'	SC	#10	117.7	**11.1%**	**106.0**
3A	A-25-005	16' - 16.5'	SC	#10	105.1	**46.3%**	**71.8**

Lab Notes: _____

UES
West Sacramento, CA
Ph: (916)372-1434

Client	Crawford & Associates
Project:	**MCSD Sewer Highway Crossing**
Location:	
Project No.:	20-640.3

Tested By:	BM/CG
Date:	1/6/2026
Checked By:	DS
Date:	1/22/2026

SHEET No **1**

PERCENT PASSING #200 SIEVE

(ASTM D 1140)

Lab No. 26-003
Date Sampled: 10/14/25
Date Received: 1/7/26

Test Method

	A: Test specimen is dispersed by soaking in water prior to wash sieving (Min. 10 min.)
X	B :Specimen is dispersed by soaking in a dispersing solution prior to wash sieving. (min. 2 hr.)

Sample ID	Sample Location		Test Method	Percentage Passing #200 Sieve
	Boring No.	Depth ft.		
4A	A-25-002	11' -11.5'	B	**46.6%**

Lab Notes:

Direct Shear Test

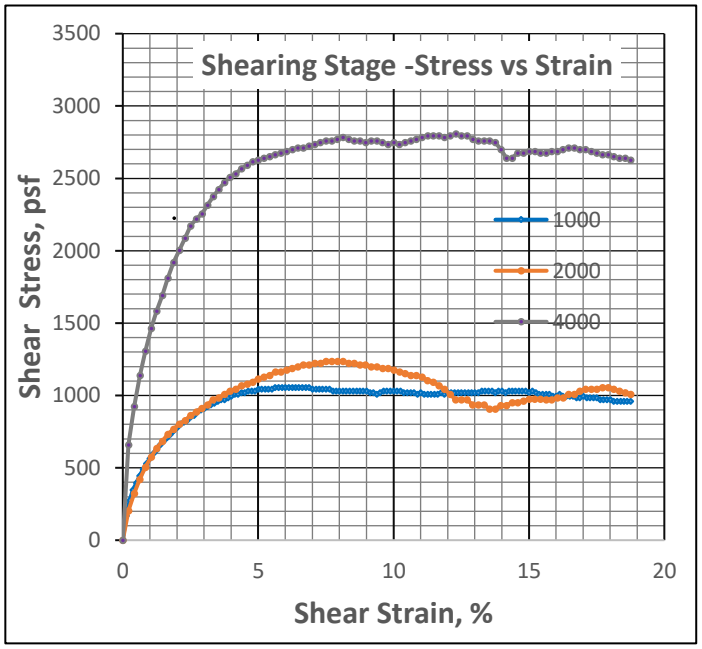
ASTM D3080

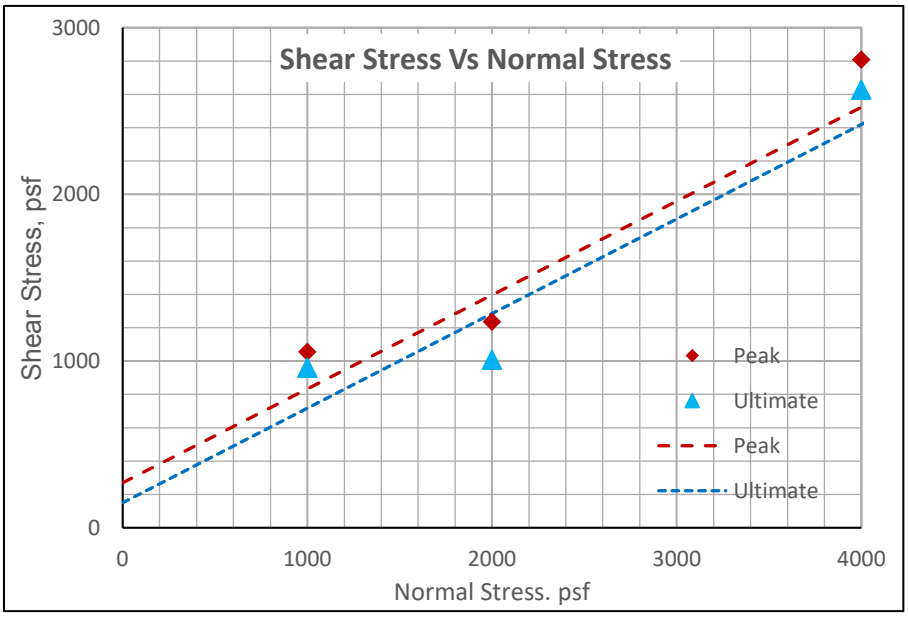
Boring No.: **A-25-001**
Depth: **6.0' - 6.5'**
Sample #/ID: **1A**
Soil Description: Dark Brown Clayey Sand w/ Gravel
Sample Type: MCAL / In-Situ

Spe. Gravity = 2.650 (assumed)
Test Conditions: Inundated

Lab No. 26-003
Date Sampled: 10/14/25
Date Received: 1/8/26

	Specimen ID	A	B	C
Initial	Height, in	1.00	1.00	1.00
	Diameter, in	2.42	2.42	2.42
	Moisture, %	22.5	22.5	22.5
	Dry Density, pcf	102.6	102.5	102.4
	Void Ratio	0.612	0.613	0.614
	Saturation, %	97.4	97.2	97.1
At Shear	Height, in	0.969	0.974	0.939
	Moisture, %	23.9	23.8	21.9
	Dry Density, pcf	105.9	105.2	109.0
	Void Ratio	0.562	0.571	0.517
	Saturation, %	100.0	100.0	100.0
	Shearing Rate	0.0086	0.0086	0.0086
Result	Normal Stress, psf	**1000**	**2000**	**4000**
	Peak Stress, psf	**1056**	**1236**	**2808**
	Ultimate Stress, psf	**960**	**1008**	**2628**
	Shear Strain at Peak, %	5.6	7.5	12.3





Estimated Shear Parameters

Parameters	Peak	Ultimate
C, psf	270	150
ϕ - degree	31.5	30.6

C - Cohesion

ϕ - Angle of Friction

Lab Note: Specimen A - observed a 1/2" rock on the shearing plane
Specimen B - observed a 3/4" rock on the shearing plane

UES
West Sacramento, CA
Ph: (916)372-1434

Client	Crawford & Associates
Project:	**MCSD Sewer Highway Crossing**
Location:	
Project No.:	20-640.3

Tested By:	BM/CG
Date:	1/6/26
Checked By:	DS
Date:	1/22/26

SHEET No **3**

Direct Shear Test

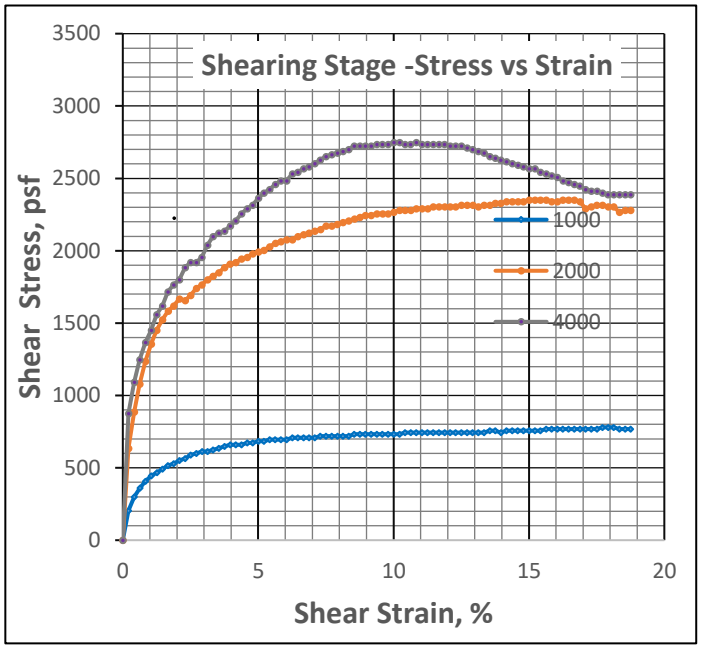
ASTM D3080

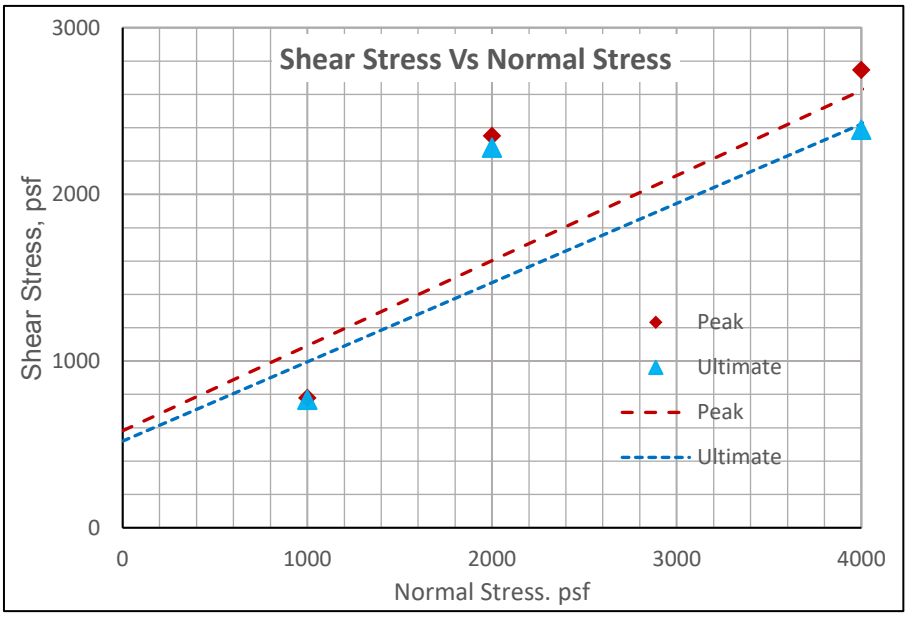
Boring No.: **A-25-001**
Depth: **8.5' - 9.0'**
Sample #/ID: **2A**
Soil Description: Dark Gray Clayey Sand w/ Gravel
Sample Type: MCAL / In-Situ

Spe. Gravity = 2.650 (assumed)
Test Conditions: Inundated

Lab No. 26-004
Date Sampled: 10/14/25
Date Received: 1/14/26

	Specimen ID	A	B	C
Initial	Height, in	1.00	1.00	1.00
	Diameter, in	2.42	2.42	2.42
	Moisture, %	28.4	28.4	28.4
	Dry Density, pcf	99.8	98.5	97.1
	Void Ratio	0.656	0.679	0.704
	Saturation, %	100.0	100.0	100.0
At Shear	Height, in	0.920	0.916	0.867
	Moisture, %	22.9	27.1	24.5
	Dry Density, pcf	108.6	107.6	111.9
	Void Ratio	0.523	0.537	0.478
	Saturation, %	100.0	100.0	100.0
	Shearing Rate	0.0086	0.0086	0.0086
Result	Normal Stress, psf	**1000**	**2000**	**4000**
	Peak Stress, psf	**780**	**2352**	**2748**
	Ultimate Stress, psf	**768**	**2280**	**2388**
	Shear Strain at Peak, %	17.7	15.0	10.0





Estimated Shear Parameters

Parameters	Peak	Ultimate
C, psf	582	520
ϕ - degree	32.0	30.0

C - Cohesion

ϕ - Angle of Friction

Lab Note: Specimen B - observed a 1/2" rock on the shearing plane

UES
West Sacramento, CA
Ph: (916)372-1434

Client	Crawford & Associates
Project:	**MCSD Sewer Highway Crossing**
Location:	
Project No.:	20-640.3

Tested By:	BM/CG
Date:	1/6/26
Checked By:	DS
Date:	1/22/26

SHEET No **4**

Direct Shear Test

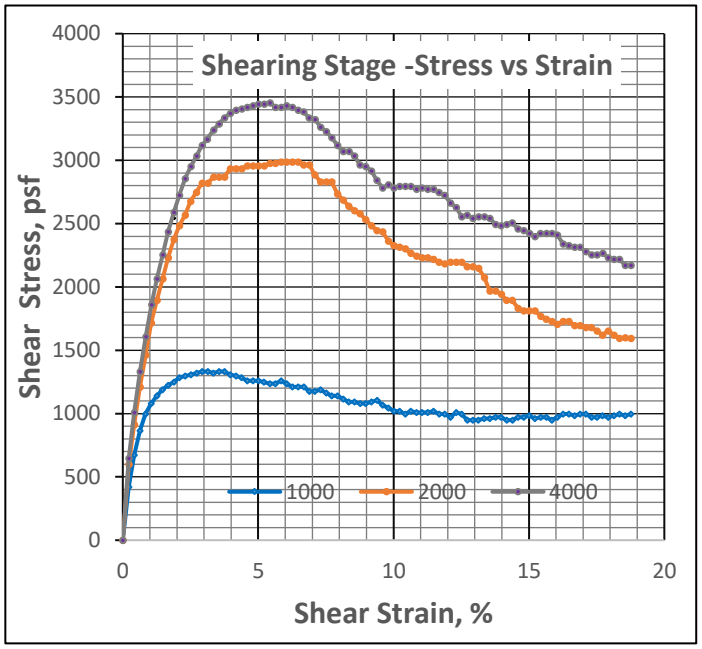
ASTM D3080

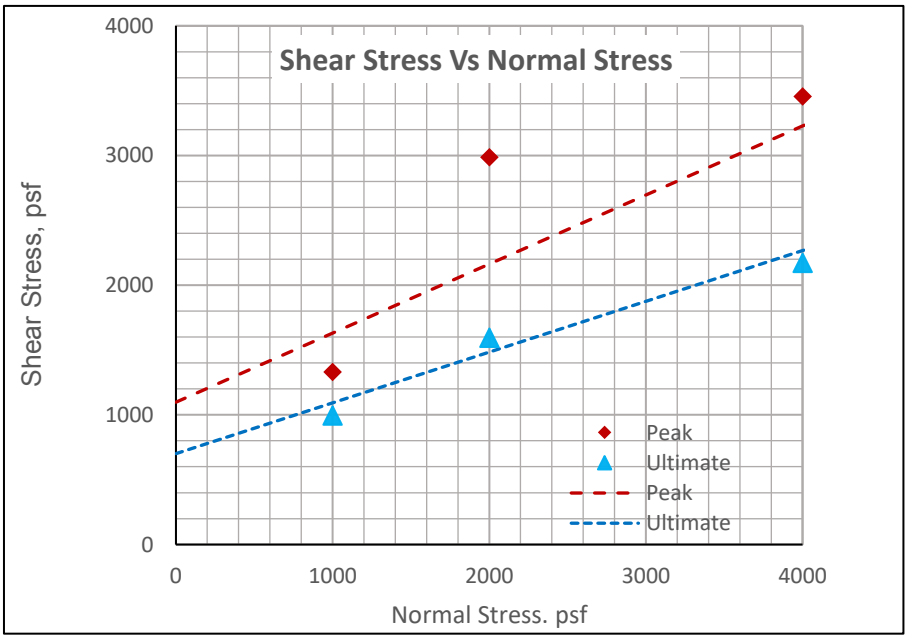
Boring No.: **A-25-001**
Depth: **15.5' - 16.0'**
Sample #/ID: **5B**
Soil Description: Brownish Gray Sand w/ Gravel
Sample Type: MCAL / In-Situ

Spe. Gravity = 2.650 (assumed)
Test Conditions: Inundated

Lab No. 26-005
Date Sampled: 10/14/25
Date Received: 1/12/26

	Specimen ID	A	B	C
Initial	Height, in	1.00	1.00	1.00
	Diameter, in	2.42	2.42	2.42
	Moisture, %	10.3	10.3	10.3
	Dry Density, pcf	123.0	122.9	123.7
	Void Ratio	0.345	0.345	0.337
	Saturation, %	79.3	79.1	81.1
At Shear	Height, in	0.984	0.966	0.963
	Moisture, %	14.3	16.2	14.3
	Dry Density, pcf	125.0	127.2	128.4
	Void Ratio	0.323	0.300	0.288
	Saturation, %	100.0	100.0	100.0
	Shearing Rate	0.025	0.025	0.025
Result	Normal Stress, psf	**1000**	**2000**	**4000**
	Peak Stress, psf	**1332**	**2988**	**3456**
	Ultimate Stress, psf	**996**	**1596**	**2172**
	Shear Strain at Peak, %	2.9	5.8	5.4





Estimated Shear Parameters

Parameters	Peak	Ultimate
C, psf	1098	701
ϕ - degree	37.0	28.0

C - Cohesion

ϕ - Angle of Friction

Lab Note: Specimen B - observed a 1/2" rock on the shearing plane

UES
West Sacramento, CA
Ph: (916)372-1434

Client	Crawford & Associates
Project:	**MCSD Sewer Highway Crossing**
Location:	
Project No.:	20-640.3

Tested By:	BM/CG
Date:	1/6/26
Checked By:	DS
Date:	1/22/26

SHEET No **5**

Direct Shear Test

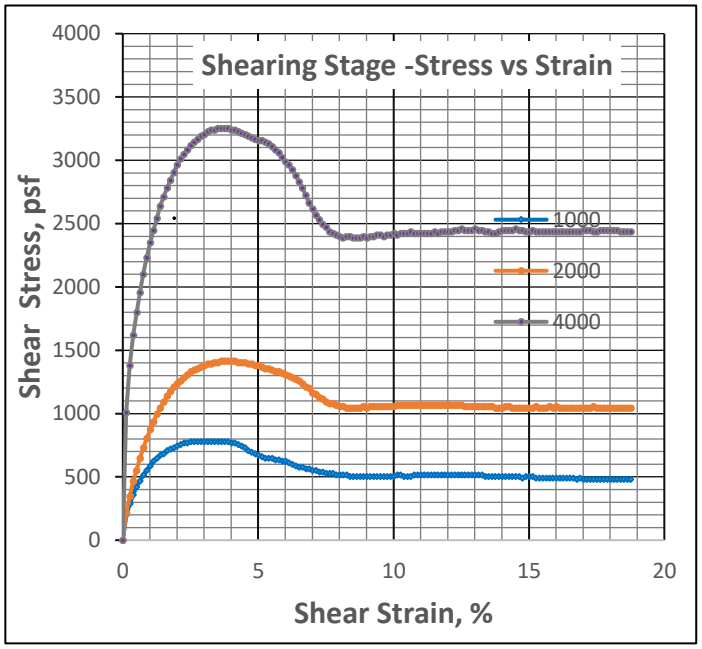
ASTM D3080

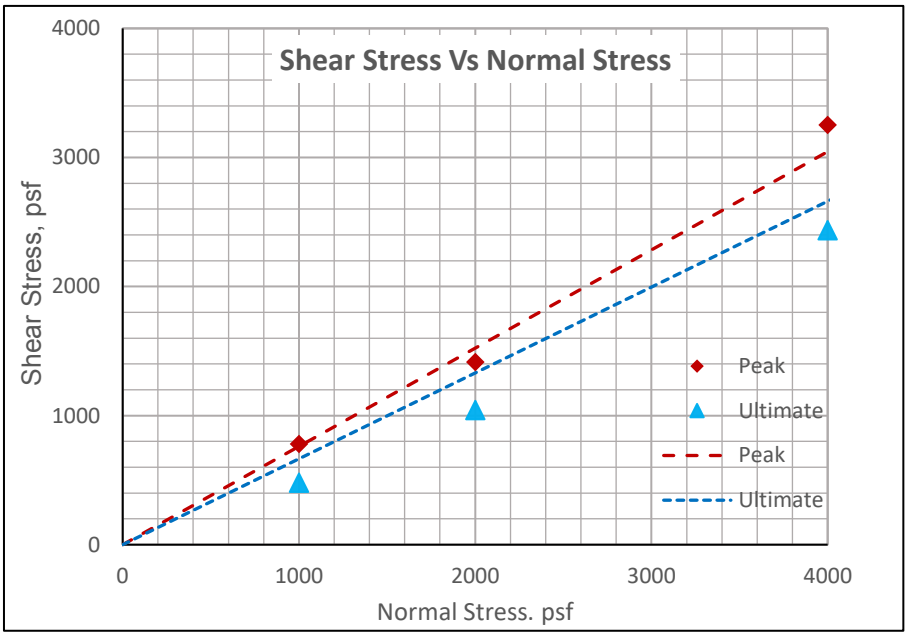
Boring No.: **A-25-002**
Depth: **11.0' - 11.5'**
Sample #/ID: **4A**
Soil Description: Gray Silty Sand
Sample Type: MCAL / In-Situ

Spe. Gravity = 2.650 (assumed)
Test Conditions: Inundated

Lab No. 26-006
Date Sampled: 10/14/25
Date Received: 1/7/26

	Specimen ID	A	B	C
Initial	Height, in	1.00	1.00	1.00
	Diameter, in	2.42	2.42	2.42
	Moisture, %	19.5	19.5	19.5
	Dry Density, pcf	101.2	101.4	101.6
	Void Ratio	0.634	0.630	0.628
	Saturation, %	81.4	81.9	82.2
At Shear	Height, in	0.980	0.975	0.974
	Moisture, %	29.5	28.4	28.7
	Dry Density, pcf	103.3	104.0	104.3
	Void Ratio	0.601	0.590	0.586
	Saturation, %	100.0	100.0	100.0
	Shearing Rate	0.025	0.025	0.025
Result	Normal Stress, psf	**1000**	**2000**	**4000**
	Peak Stress, psf	**780**	**1416**	**3252**
	Ultimate Stress, psf	**480**	**1044**	**2436**
	Shear Strain at Peak, %	2.5	3.6	3.5





Estimated Shear Parameters

Parameters	Peak	Ultimate
C, psf	0	0
ϕ - degree	37.0	33.4

C - Cohesion

ϕ - Angle of Friction

Lab Note: Percent passing No. 200 sieve (0.075 mm): 46.6%

UES
West Sacramento, CA
Ph: (916)372-1434

Client	Crawford & Associates
Project:	**MCSD Sewer Highway Crossing**
Location:	
Project No.:	20-640.3

Tested By:	BM/CG
Date:	1/6/26
Checked By:	DS
Date:	1/22/26

SHEET No **6**

Direct Shear Test

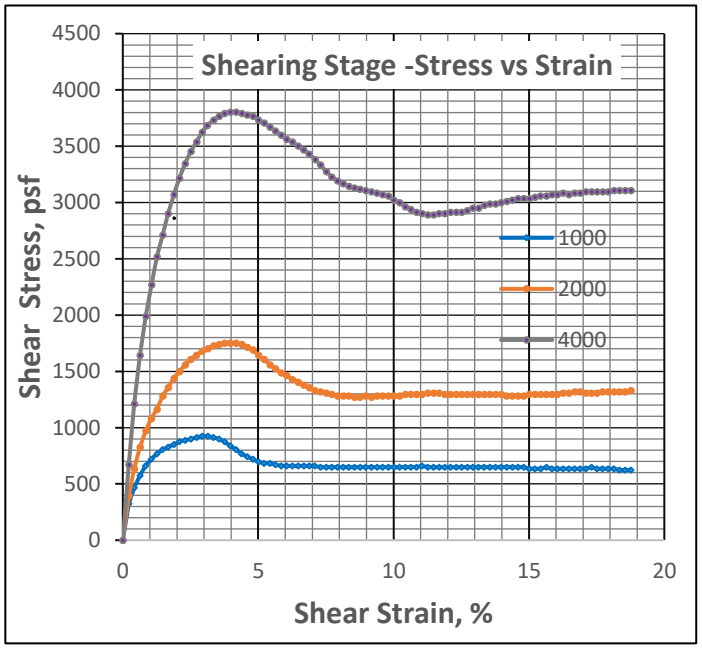
ASTM D3080

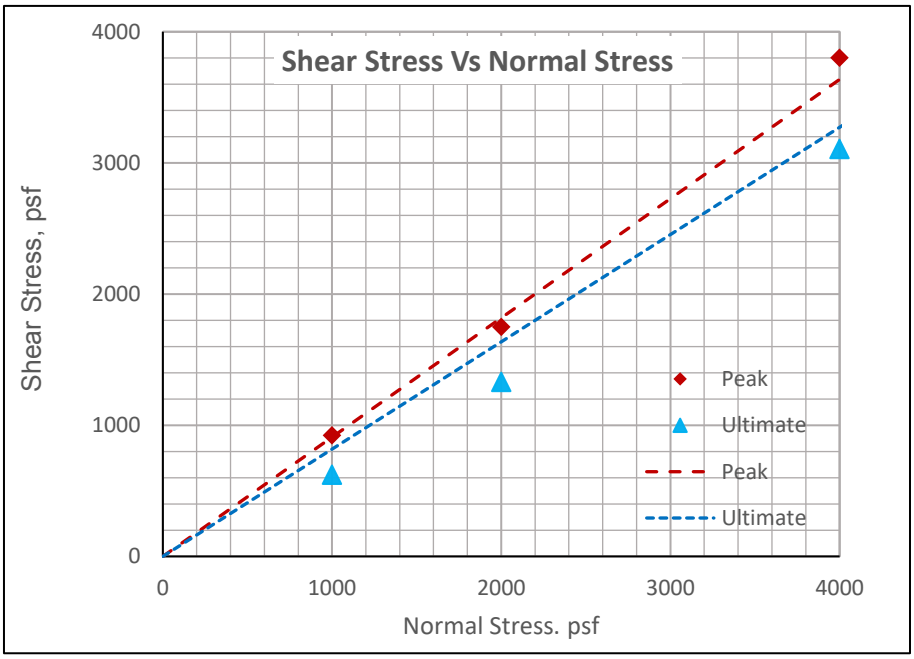
Boring No.: **A-25-003**
Depth: **15.5' - 16.0'**
Sample #/ID: **5B**
Soil Description: Gray Sand
Sample Type: MCAL / In-Situ

Spe. Gravity = 2.650 (assumed)
Test Conditions: Inundated

Lab No. 26-007
Date Sampled: 10/14/25
Date Received: 1/13/26

	Specimen ID	A	B	C
Initial	Height, in	1.00	1.00	1.00
	Diameter, in	2.42	2.42	2.42
	Moisture, %	19.4	19.4	19.4
	Dry Density, pcf	102.2	102.8	104.3
	Void Ratio	0.619	0.609	0.585
	Saturation, %	83.2	84.5	87.9
At Shear	Height, in	0.986	0.972	0.961
	Moisture, %	21.3	22.8	22.9
	Dry Density, pcf	103.6	105.8	108.6
	Void Ratio	0.596	0.563	0.523
	Saturation, %	94.6	100.0	100.0
	Shearing Rate	0.025	0.025	0.025
Result	Normal Stress, psf	**1000**	**2000**	**4000**
	Peak Stress, psf	**924**	**1752**	**3804**
	Ultimate Stress, psf	**624**	**1332**	**3108**
	Shear Strain at Peak, %	2.9	3.8	4.0





Estimated Shear Parameters

Parameters	Peak	Ultimate
C, psf	0	0
ϕ - degree	42.0	39.0

C - Cohesion

ϕ - Angle of Friction

Lab Note: _____

UES
West Sacramento, CA
Ph: (916)372-1434

Client	Crawford & Associates
Project:	**MCSD Sewer Highway Crossing**
Location:	
Project No.:	20-640.3

Tested By:	BM/CG
Date:	1/6/26
Checked By:	DS
Date:	1/22/26

SHEET No **7**

Direct Shear Test

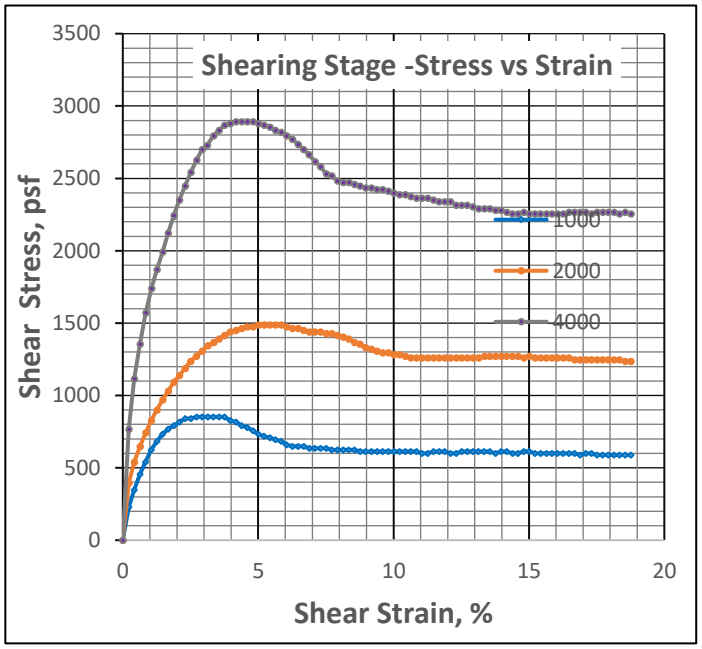
ASTM D3080

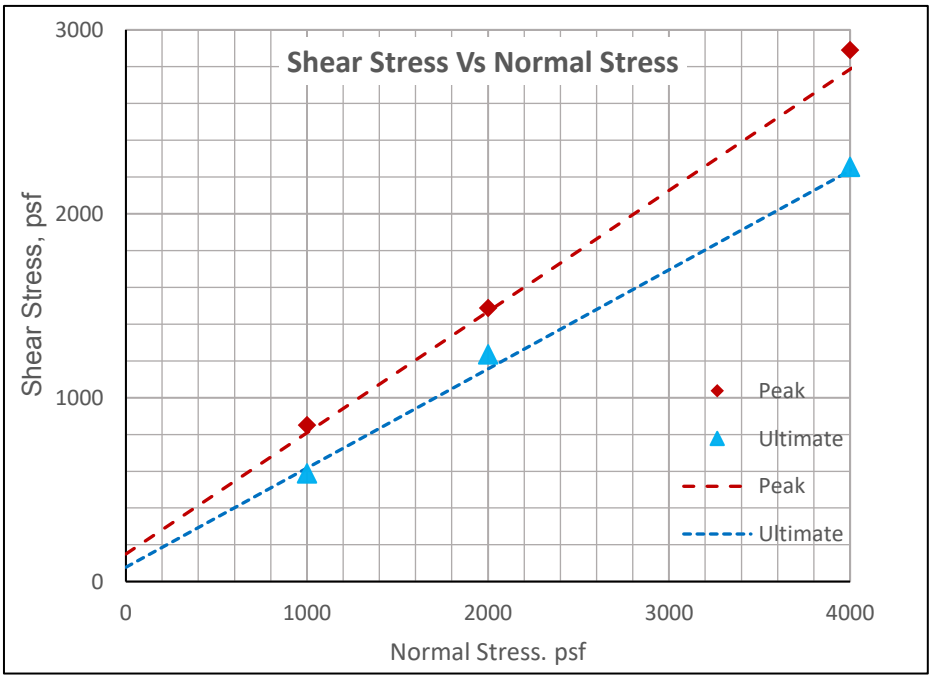
Boring No.: **A-25-004**
Depth: **16.0' - 16.5'**
Sample #/ID: **4A**
Soil Description: Light Brown Silty Sand
Sample Type: MCAL / In-Situ

Spe. Gravity = 2.650 (assumed)
Test Conditions: Inundated

Lab No. 26-008
Date Sampled: 10/14/25
Date Received: 1/9/26

	Specimen ID	A	B	C
Initial	Height, in	1.00	1.00	1.00
	Diameter, in	2.42	2.42	2.42
	Moisture, %	11.1	11.1	11.1
	Dry Density, pcf	105.1	105.6	106.0
	Void Ratio	0.574	0.566	0.560
	Saturation, %	51.1	51.8	52.3
At Shear	Height, in	0.932	0.954	0.934
	Moisture, %	23.3	24.6	21.9
	Dry Density, pcf	112.7	110.7	113.5
	Void Ratio	0.467	0.494	0.457
	Saturation, %	100.0	100.0	100.0
	Shearing Rate	0.025	0.025	0.025
Result	Normal Stress, psf	**1000**	**2000**	**4000**
	Peak Stress, psf	**852**	**1488**	**2892**
	Ultimate Stress, psf	**588**	**1236**	**2256**
	Shear Strain at Peak, %	2.7	5.0	4.2





Estimated Shear Parameters

Parameters	Peak	Ultimate
C, psf	150	78
ϕ - degree	34.3	28.8

C - Cohesion

ϕ - Angle of Friction

Lab Note: _____

UES
West Sacramento, CA
Ph: (916)372-1434

Client	Crawford & Associates
Project:	**MCSD Sewer Highway Crossing**
Location:	
Project No.:	20-640.3

Tested By:	BM/CG
Date:	1/6/26
Checked By:	DS
Date:	1/22/26

SHEET No **8**

Direct Shear Test

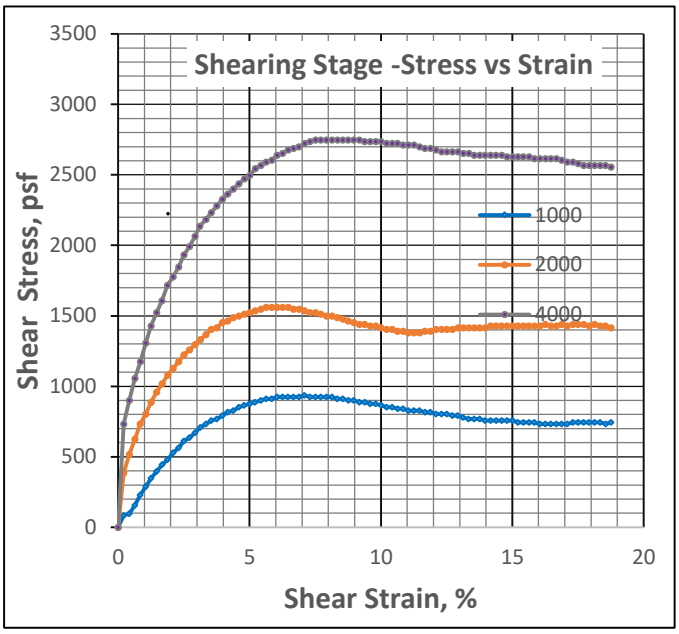
ASTM D3080

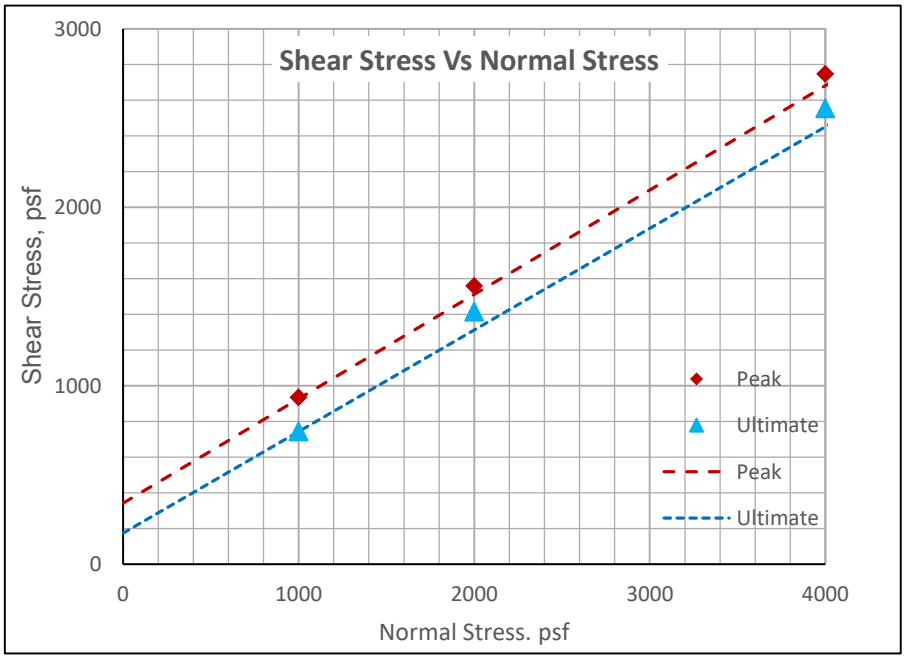
Boring No.: **A-25-005**
Depth: **16.0' - 16.5'**
Sample #/ID: **3A**
Soil Description: Dark Gray Clayey Sand w/ Organics
Sample Type: MCAL / In-Situ (A), Remolded (B, C)

Spe. Gravity = 2.200 (assumed)
Test Conditions: Inundated

Lab No. 26-009
Date Sampled: 10/14/25
Date Received: 1/9/26

	Specimen ID	A	B	C
Initial	Height, in	1.00	1.00	1.00
	Diameter, in	2.42	2.42	2.42
	Moisture, %	46.3	46.3	46.3
	Dry Density, pcf	76.1	76.1	76.1
	Void Ratio	0.803	0.805	0.805
	Saturation, %	100.0	100.0	100.0
At Shear	Height, in	0.973	0.941	0.887
	Moisture, %	35.0	30.1	29.0
	Dry Density, pcf	78.2	80.9	85.7
	Void Ratio	0.755	0.697	0.601
	Saturation, %	100.0	100.0	100.0
	Shearing Rate	0.0086	0.0086	0.0086
Result	Normal Stress, psf	**1000**	**2000**	**4000**
	Peak Stress, psf	**936**	**1560**	**2748**
	Ultimate Stress, psf	**744**	**1416**	**2556**
	Shear Strain at Peak, %	7.1	5.6	7.5





Estimated Shear Parameters

Parameters	Peak	Ultimate
C, psf	342	174
ϕ - degree	33.0	30.9

C - Cohesion

ϕ - Angle of Friction

Specimens B & C contained large voids due to tree roots and were remolded.

Lab Note: The sample exhibited a high percentage of organics.

UES
West Sacramento, CA
Ph: (916)372-1434

Client	Crawford & Associates
Project:	**MCSD Sewer Highway Crossing**
Location:	
Project No.:	20-640.3

Tested By:	BM/CG
Date:	1/6/26
Checked By:	DS
Date:	1/22/26

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services

Project Name: MCSD Highway Sewer Crossing
Crawford File No: 20-640.3
Date: 12/17/25
Technician: K. Joyce
Sample ID: A-25-006 5B
Depth: 18.0-18.5

Plastic Index - ASTM D4318

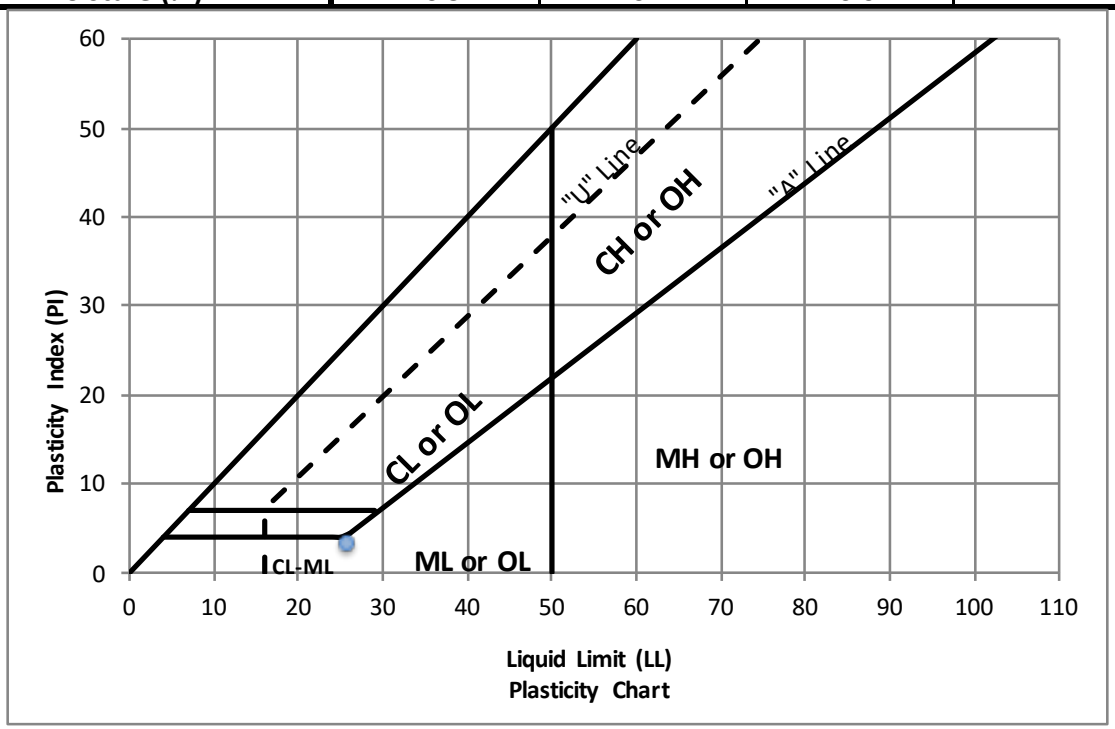
PI	3	LL	26	PL	23

Plastic Limit

	1	2	3	4
Moisture (%)	**22.4**	**22.9**		

Liquid Limit

	1	2	3	4
Blowcounts	15	18	25	
Moisture (%)	**26.9**	**26.1**	**26.0**	



Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 12/19/2025
Date Submitted 12/16/2025

To: Kelly Joyce
Crawford & Associates INC.
21 W. 4th St
Eureka,CA 95501

From: Gene Oliphant, Ph.D.
General Manager

The reported analysis was requested for the following location:
Location : 20-640.3 Site ID : A-25-001(1B).
Thank you for your business.

* For future reference to this analysis please use SUN # 97158-198499.

EVALUATION FOR SOIL CORROSION

Soil pH	6.94	
Moisture	13.3 %	
Minimum Resistivity	4.85 ohm-cm (x1000)	
Chloride	13.7 ppm	00.00137 %
Sulfate	35.4 ppm	00.00354 %
Redox Potential	(+) 299 mv	

Sulfate Reducing Bacteria Presence - NEGATIVE

METHODS

pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m
Redox Potential ASTM D1498m, Sulfate Reducing Bacteria AWWA C105-72

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 12/19/2025
Date Submitted 12/16/2025

To: Kelly Joyce
Crawford & Associates INC.
21 W. 4th St
Eureka,CA 95501

From: Gene Oliphant, Ph.D. \
General Manager \

The reported analysis was requested for the following location:
Location : 20-640.3 Site ID : A-25-002(4B).
Thank you for your business.

* For future reference to this analysis please use SUN # 97158-198500.

EVALUATION FOR SOIL CORROSION

Soil pH	5.35		
Moisture	13.0 %		
Minimum Resistivity	14.25 ohm-cm (x1000)		
Chloride	8.9 ppm	00.00089	%
Sulfate	5.5 ppm	00.00055	%
Redox Potential	(+) 375 mv		

Sulfate Reducing Bacteria Presence - NEGATIVE

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m
Redox Potential ASTM D1498m, Sulfate Reducing Bacteria AWWA C105-72

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 12/19/2025
Date Submitted 12/16/2025

To: Kelly Joyce
Crawford & Associates INC.
21 W. 4th St
Eureka,CA 95501

From: Gene Oliphant, Ph.D. \ GO
General Manager \

The reported analysis was requested for the following location:
Location : 20-640.3 Site ID : A-25-003(5C).
Thank you for your business.

* For future reference to this analysis please use SUN # 97158-198501.

EVALUATION FOR SOIL CORROSION

Soil pH	5.98		
Moisture	14.0 %		
Minimum Resistivity	25.37 ohm-cm (x1000)		
Chloride	16.1 ppm	00.00161	%
Sulfate	2.9 ppm	00.00029	%
Redox Potential	(+) 380 mv		

Sulfate Reducing Bacteria Presence - NEGATIVE

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m
Redox Potential ASTM D1498m, Sulfate Reducing Bacteria AWWA C105-72

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 12/19/2025
Date Submitted 12/16/2025

To: Kelly Joyce
Crawford & Associates INC.
21 W. 4th St
Eureka,CA 95501

From: Gene Oliphant, Ph.D.
General Manager

The reported analysis was requested for the following location:
Location : 20-640.3 Site ID : A-25-004(4C).
Thank you for your business.

* For future reference to this analysis please use SUN # 97158-198502.

EVALUATION FOR SOIL CORROSION

Soil pH	6.76		
Moisture	11.9 %		
Minimum Resistivity	6.84 ohm-cm (x1000)		
Chloride	9.3 ppm	00.00093	%
Sulfate	18.0 ppm	00.00180	%
Redox Potential	(+) 320 mv		

Sulfate Reducing Bacteria Presence - NEGATIVE

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m
Redox Potential ASTM D1498m, Sulfate Reducing Bacteria AWWA C105-72

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 12/19/2025
Date Submitted 12/16/2025

To: Kelly Joyce
Crawford & Associates INC.
21 W. 4th St
Eureka,CA 95501

From: Gene Oliphant, Ph.D. \
General Manager \ GO

The reported analysis was requested for the following location:
Location : 20-640.3 Site ID : A-25-005(3B).
Thank you for your business.

* For future reference to this analysis please use SUN # 97158-198503.

EVALUATION FOR SOIL CORROSION

Soil pH	6.40		
Moisture	15.7 %		
Minimum Resistivity	6.56 ohm-cm (x1000)		
Chloride	11.8 ppm	00.00118	%
Sulfate	29.1 ppm	00.00291	%
Redox Potential	(+) 194 mv		

Sulfate Reducing Bacteria Presence - NEGATIVE

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m
Redox Potential ASTM D1498m, Sulfate Reducing Bacteria AWWA C105-72

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 12/19/2025
Date Submitted 12/16/2025

To: Kelly Joyce
Crawford & Associates INC.
21 W. 4th St
Eureka,CA 95501

From: Gene Oliphant, Ph.D.
General Manager

The reported analysis was requested for the following location:
Location : 20-640.3 Site ID : A-25-006(4B).
Thank you for your business.

* For future reference to this analysis please use SUN # 97158-198504.

EVALUATION FOR SOIL CORROSION

Soil pH	4.97		
Moisture	19.8 %		
Minimum Resistivity	1.11 ohm-cm (x1000)		
Chloride	22.0 ppm	00.00220	%
Sulfate	424.6 ppm	00.04246	%
Redox Potential	(+) 112 mv		

Sulfate Reducing Bacteria Presence - NEGATIVE

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m
Redox Potential ASTM D1498m, Sulfate Reducing Bacteria AWWA C105-72

SUNLAND ANALYTICAL LAB
11419 Sunrise Gold Circle, # 10
Rancho Cordova, CA 95742
(916)852-8557

INVOICE

Inv.No. 117158

Crawford & Associates INC.
21 W. 4th St
Eureka,CA 95501

Date 12/19/2025
Terms: NET 30, 30+ 15%
Customer P.O.#
Requestor: Joyce

ATTENTION ACCOUNTS PAYABLE

* Please indicate Invo.# on remittance

SUN NOS.	SAMPLE LOCATION		ANALYSIS	PRICE
198499	20-640.3	A-25-001(1B)	CTP.5	255.00
198500	20-640.3	A-25-002(4B)	CTP.5	255.00
198501	20-640.3	A-25-003(5C)	CTP.5	255.00
198502	20-640.3	A-25-004(4C)	CTP.5	255.00
198503	20-640.3	A-25-005(3B)	CTP.5	255.00
198504	20-640.3	A-25-006(4B)	CTP.5	255.00
	********* Total *********			1530.00

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APPENDIX B
CALTRANS ENCROACHMENT PERMIT

(ENCLOSED SEPARATELY)

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APPENDIX C
HUMBOLDT COUNTY
ENCROACHMENT PERMIT

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DEPARTMENT OF PUBLIC WORKS
COUNTY OF HUMBOLDT
MAILING ADDRESS: 1106 SECOND STREET, EUREKA, CA 95501-0579
AREA CODE 707

On-line
Web: humboldtgov.org

Public Works Building
Second & L St., Eureka
Fax 445-7409

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

Clark Complex
Harris & H St., Eureka
Fax 445-7388

Land Use 445-7205

ENCROACHMENT PERMIT

PERMIT NO. EP 26019

PERMITTEE: **MCKINLEYVILLE COMMUNITY SERVICES DISTRICT**
ADDRESS: **% PAT KASPARI**
1515 CENTRAL AVE
MCKINLEYVILLE, CA 95519

DATE ISSUED: **DATES TO BE ADDED AFTER SIGNATURE**
EXPIRATION:

CONTRACTOR: **TO BE DETERMINED**
ADDRESS:

In response to your request received 02/10/2026 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 bore and install approximately 40 feet of 42 inch steel casing within COUNTY rights of ways across Thiel Ave (4M095) from APN 510-302-042 (No Situs) across to APN 510-451-043 (No Situs).

Install a new manhole cover fronting APN 510-302-042 (No Situs).

All work shall be performed to COUNTY standards found in County Code Section 411.

Note: Final 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.

FOR BID PURPOSES ONLY

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 TO BE DETERMINED. (hereinafter referred to as CONTRACTOR) in accordance with submitted plans by GHD dated 03/09/2026 titled *McKINLEYVILLE COMMUNITY SERVICES DISTRICT HIGHWAY SEWER CROSSING RETROFIT* for the McKinleyville Community Services District (hereinafter referred to as DISTRICT). 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.

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.

FOR BID PURPOSES ONLY

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
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.

FOR BID PURPOSES ONLY

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.

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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 2014 Edition, as amended for use in California), April 1, 2025 or latest edition, and to the satisfaction of COUNTY. Warning and flagging of motorists at work locations shall be conducted ***AT ALL TIMES*** by properly trained personnel.

- CONTRACTOR shall use current revisions of Caltrans 2024 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.

FOR BID PURPOSES ONLY

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.

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 2025. 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.

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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 2025 standard plans.

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. The as-builts shall be submitted to the COUNTY for review and approval in PDF format. The as-built drawings shall be prepared by a registered civil engineer or licensed land surveyor; 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.

FOR BID PURPOSES ONLY

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:

_____
Tony Ye, Engineering Technician

Land Use Division
3015 H Street
Eureka CA 95501
(707) 445-7205

cc: Darrell Crawford, Road Crew Supervisor
Steve Finch, Road Division Manager
Roads Dispatch; Deputy Director-Roads
File

PROJECT # 850585

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 2024 Standard Plans T9 and T13

FOR BID PURPOSES ONLY

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 County of Humboldt Risk Management..

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.

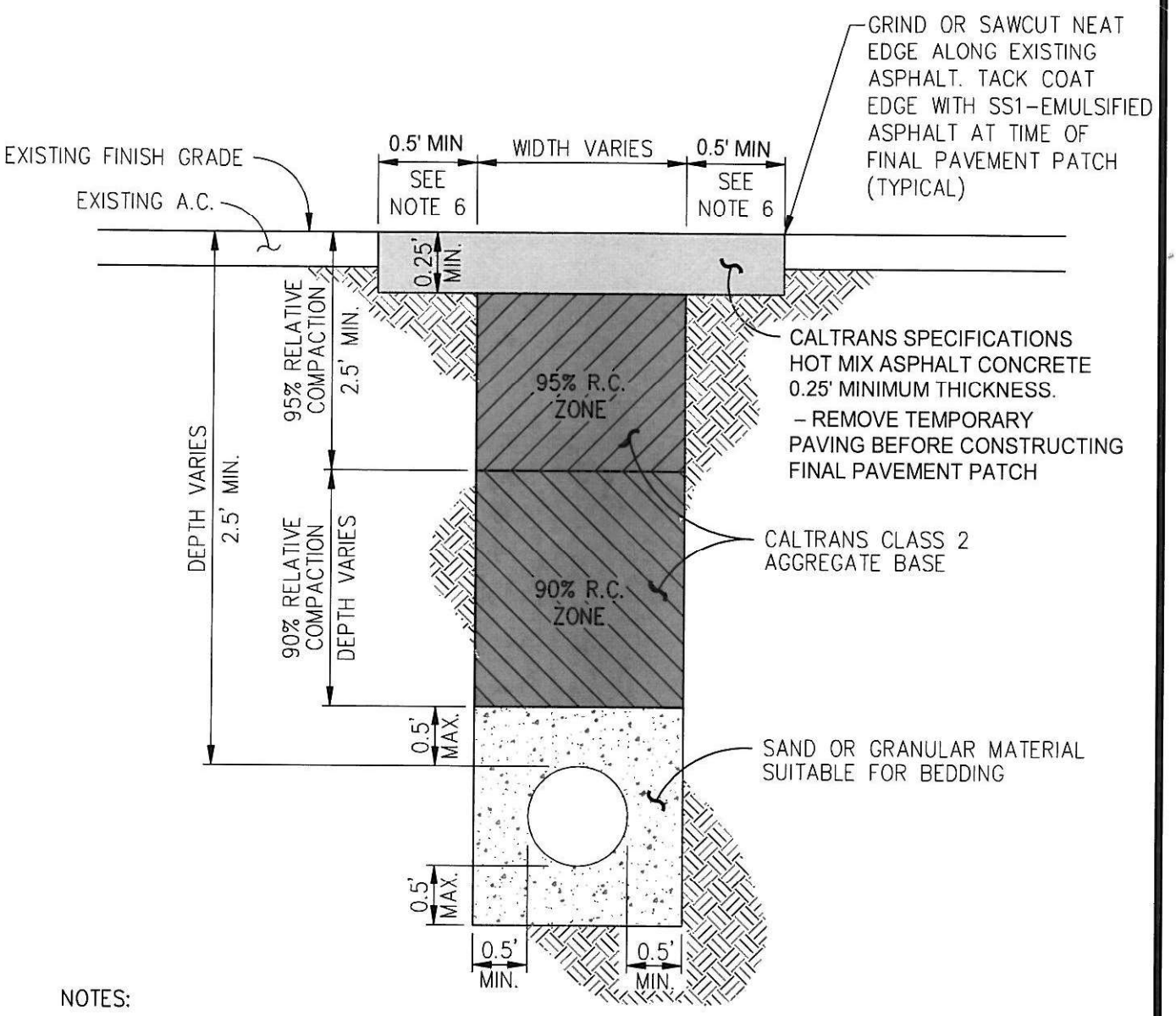
b. The policy shall not be canceled or materially reduced in coverage without thirty (30) days prior written notice (10 days for non-payment of the premium) to COUNTY by certified mail.

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 Manager 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

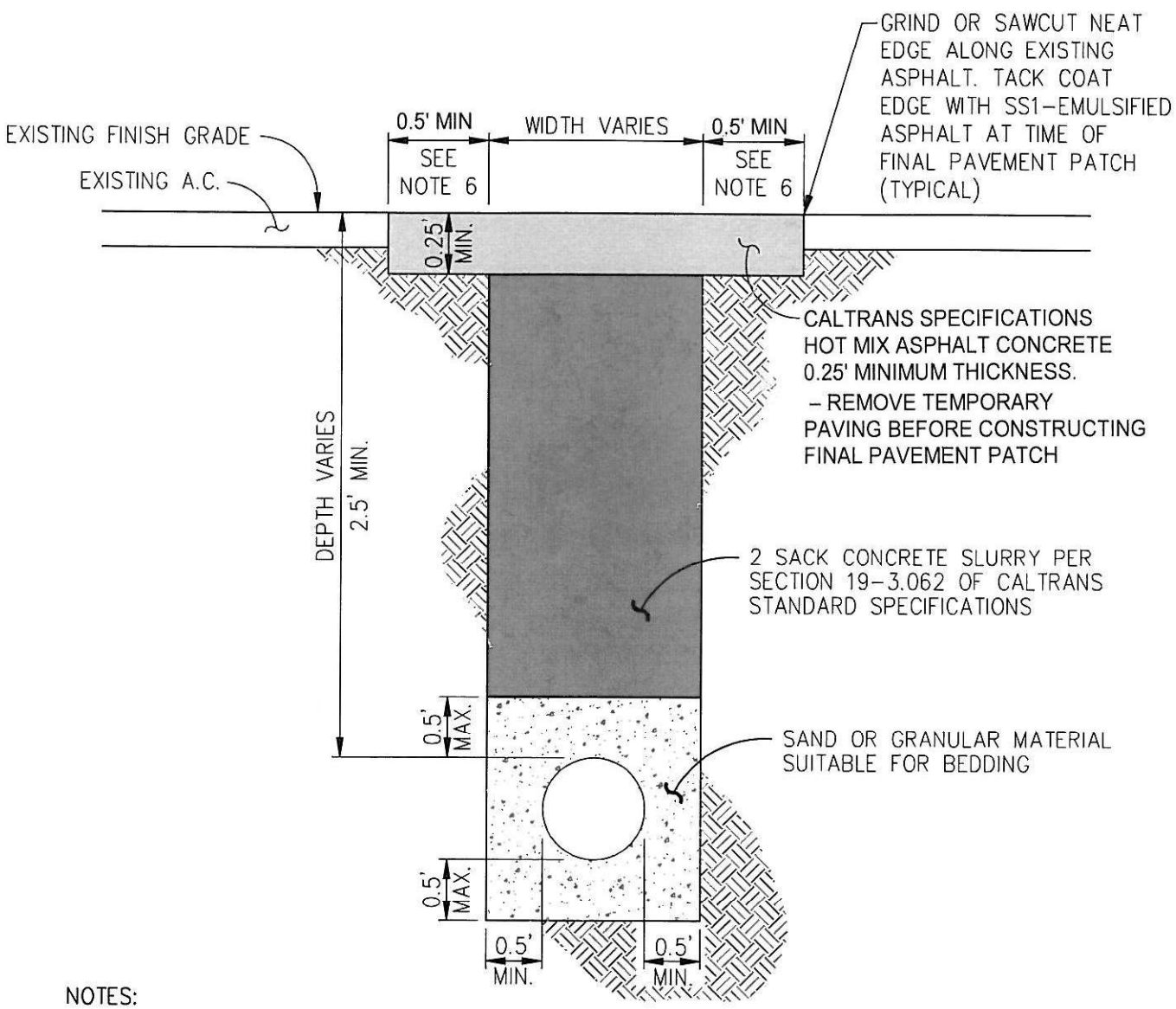
TYPE I TRENCH DETAIL -AGGREGATE BASE BACKFILL-

STD DWG

ISSUED: 08/26/2009 REVISED 04/22/2013

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SHT 1 OF 1



NOTES:

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 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.

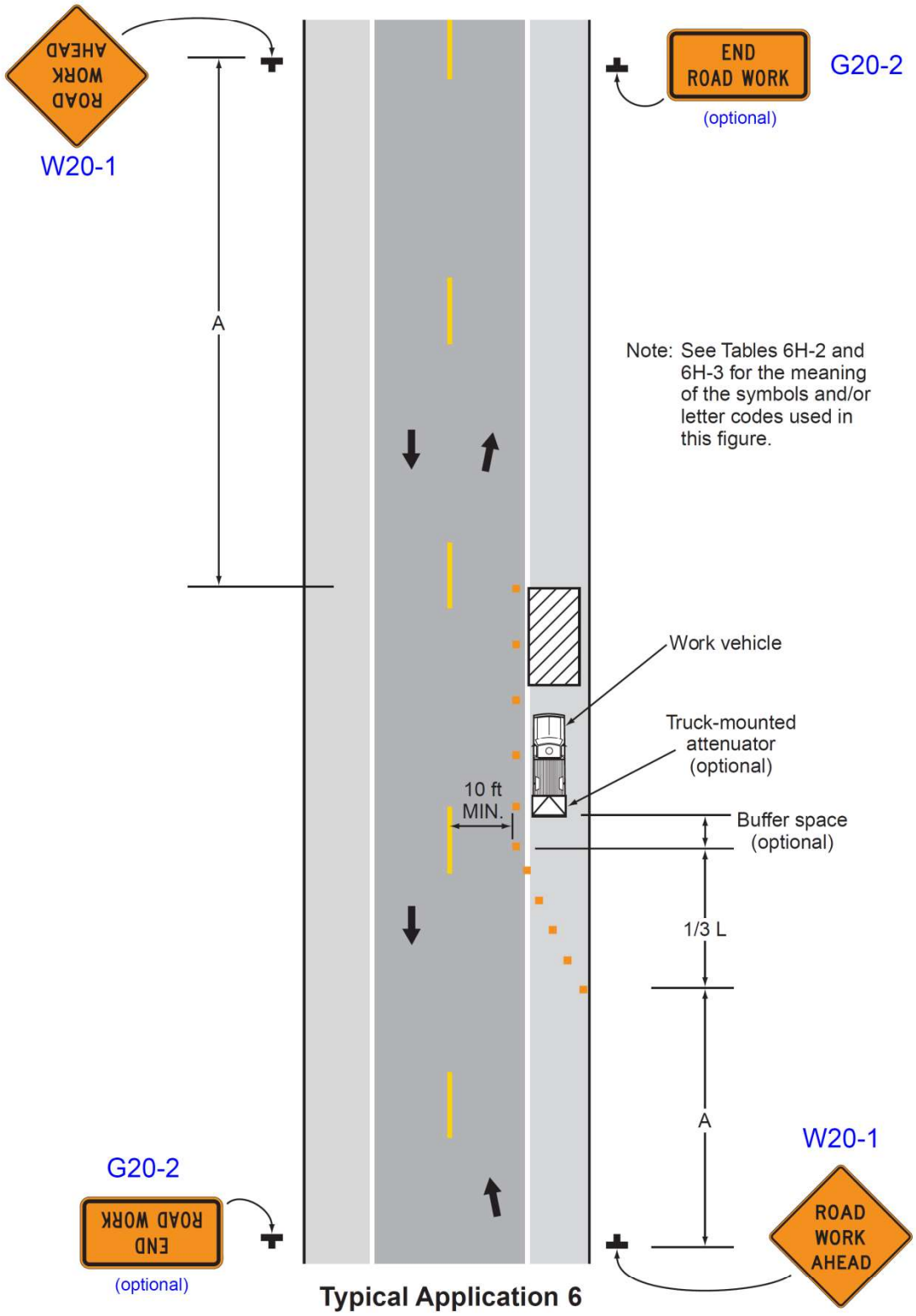
16. Except for short durations and mobile operations, when a highway shoulder is occupied and bicyclists would be sharing a lane with vehicular traffic, as a result of the TTC zone, speed reduction countermeasures should be used to reduce traffic speeds in the TTC zone. Refer to Sections 6C.01 and 6D.03.

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)
Work Within the Traveled Way of a Roundabout (see Section 6G.13)	
Partial Closure in a Single-Lane Roundabout	TA-106(CA)
Inside Lane Closure on a Multi-Lane Roundabout	TA-107(CA)

Table 6H-2. Meaning of Symbols on Typical Application Diagrams

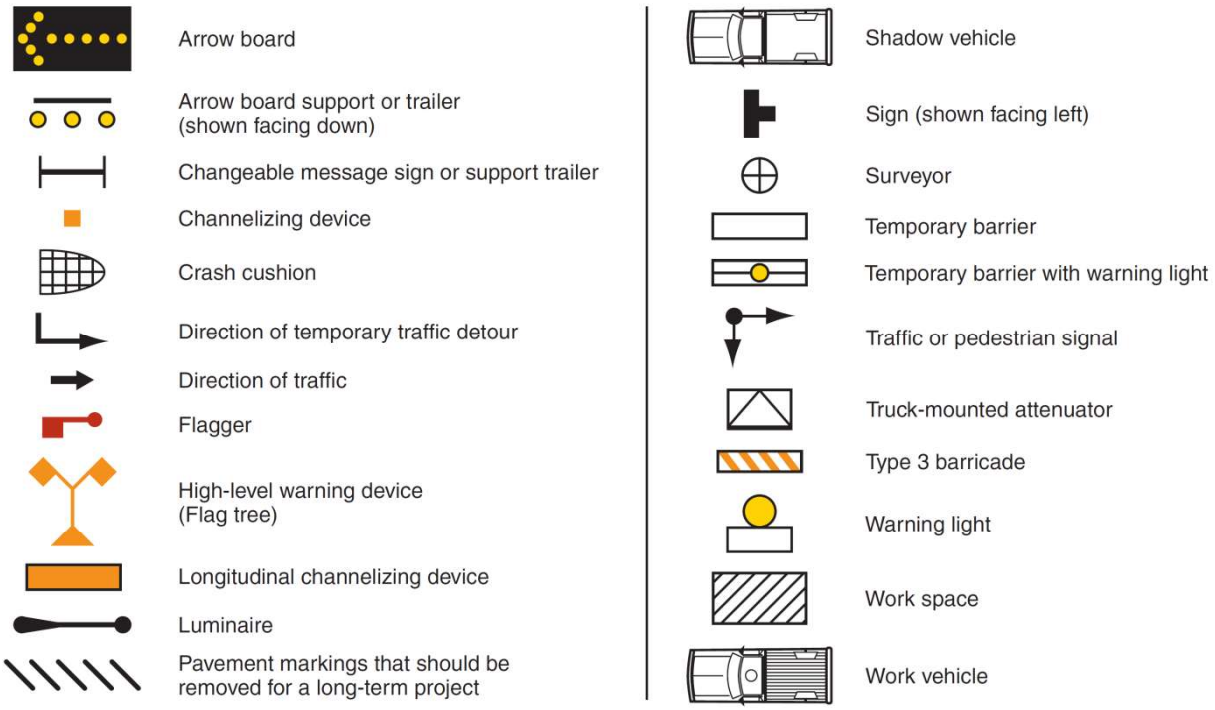


Table 6H-3. Recommended Advance Warning Sign ~~Minimum~~ Spacing

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

REGISTERED CIVIL ENGINEER

September 20, 2024
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Mohan V. Bonala
No. C63046
Exp. 6-30-26
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

T9

7-1-24

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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.

SIGN PANEL SIZE (Min)

- A 48" x 48"
- B 30" x 30"
- C 36" x 18"
- D 36" x 42"
- E 20" x 7"

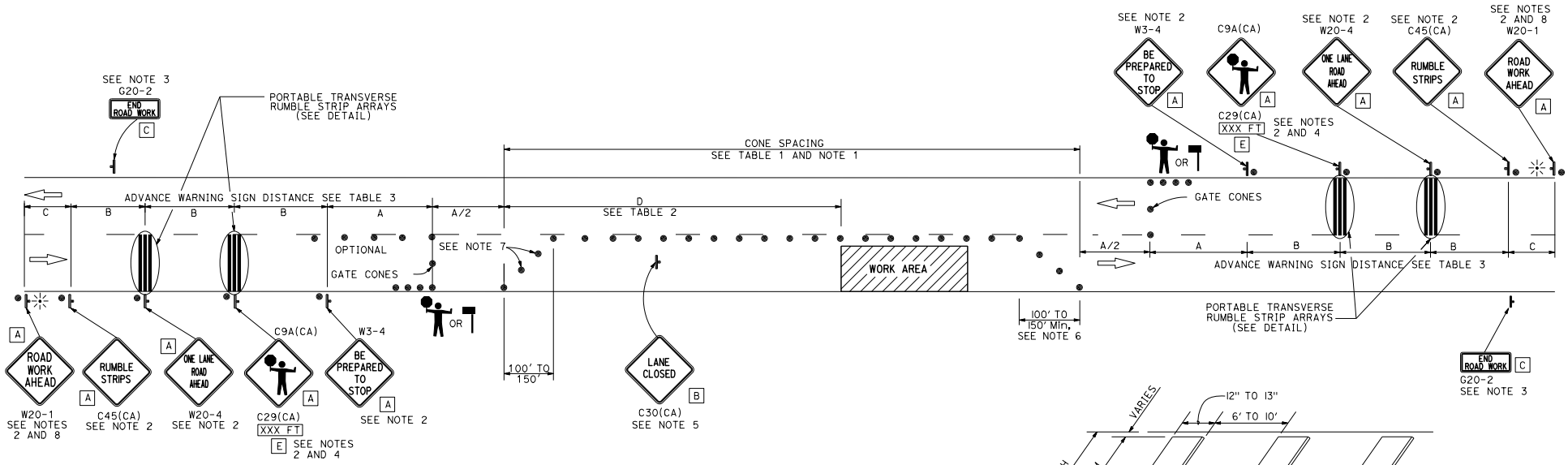
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

September 20, 2024
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Mohan V. Bonala — No. C63046 — Exp. 6-30-26 — 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.

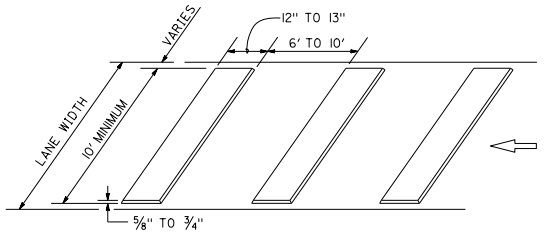


NOTES:

1. Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
2. Sign must be equipped with at least two flags for daytime closures. Flags must be orange in color and at least 16 inches by 16 inches in size. Place flashing beacons as shown for closures 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 the 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. If C45(CA) is not used, measure distance C from W20-4.

LEGEND

- TRAFFIC CONE
- TEMPORARY TRAFFIC CONTROL SIGN
- PORTABLE FLASHING BEACON
- FLAGGER
- AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD)



PORTABLE TRANSVERSE RUMBLE STRIP ARRAY DETAIL

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM WITH REVERSIBLE CONTROL ON TWO LANE CONVENTIONAL HIGHWAYS

NO SCALE

T13

7-1-24

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APPENDIX D
UNDERGROUND CLASSIFICATIONS

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STATE OF CALIFORNIA GAVIN NEWSOM. Governor

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT
1750 Howe Avenue, Suite 450
Sacramento, California 95825
DoshMTsac@dir.ca.gov

Telephone (916) 574-2540
FAX (916) 574-2542

February 11, 2026

McKinleyville Community Services District
1656 Sutter Road
McKinleyville, CA, 95519

Subject: Project: 26046 - HIGHWAY SEWER CROSSING RETROFIT, Humboldt County
Classification: Potentially Gassy with Special Conditions
Number Attached: 3 (A-C)

The information provided to this office relative to the above project has been reviewed. Based on this analysis, the Underground Classifications of "Potentially Gassy with Special Conditions" have been assigned to the tunnels identified on your submittal. Please retain the original Classificationfor your records and deliver a true and correct copy of each Classifications to the tunnel contractor for posting at the job site.

When the contractor who will be performing the work is selected, please advise them to notify this office to schedule the mandated Pre-Job Conference with the Division prior to commencing any activity associated with boring of the tunnel. A Pre-Job Request Form is enclosed.

Should you have another bore under construction that is not required to have an Underground Classification (i.e.: less than 30 inches in diameter), please contact the Mining and Tunneling Unit prior to any employee's entry into such a space.

If you have any questions on this subject, please contact this office at your earliest convenience.

Sincerely,

Randell Dutton
Acting Senior Safety Engineer

enc: Classifications
Pre-Job Request Form

cc: Eli Stockwell
Elijah.stockwell@ghd.com

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

26046B023CT — MCKINLEYVILLE COMMUNITY SERVICES DISTRICT

of 1656 SUTTER ROAD, MCKINLEYVILLE, CA 95519

at HIGHWAY SEWER CROSSING RETROFIT

has been classified as *** POTENTIALLY GASSY WITH SPECIAL CONDITIONS ***

as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

*****SPECIAL CONDITIONS*****

1. **Mechanical ventilation shall be so arranged to exhaust return air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.**
2. **The Division shall be notified immediately if a flammable gas or petroleum vapor exceeds 5 percent of the Lower Explosive Limit (LEL).**

ALL UTILITIES TO BE POTHOLED PRIOR TO BORING AND EXCAVATION

Middle Bore: The 42-inch-diameter steel casing approximately 330-feet-long bore located beneath US-101 approximately 300 feet north of the Halfway Avenue and Coach Way intersection in McKinleyville, Humboldt County

This classification shall be conspicuously posted at the place of employment.

Randell Dutton, Acting Senior Safety Engineer

February 12, 2026

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

26046C023CT — MCKINLEYVILLE COMMUNITY SERVICES DISTRICT

of 1656 SUTTER ROAD, MCKINLEYVILLE, CA 95519

at HIGHWAY SEWER CROSSING RETROFIT

has been classified as *** POTENTIALLY GASSY WITH SPECIAL CONDITIONS ***

as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. **Mechanical ventilation shall be so arranged to exhaust return air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.**
2. **The Division shall be notified immediately if a flammable gas or petroleum vapor exceeds 5 percent of the Lower Explosive Limit (LEL).**

ALL UTILITIES TO BE POTHOLED PRIOR TO BORING AND EXCAVATION

South Bore: The 42-inch-diameter steel casing approximately 270-feet-long bore located beneath US-101 approximately 2,000 feet south of Salmon Avenue and Greenacres Road, McKinleyville, Humboldt County

This classification shall be conspicuously posted at the place of employment.

Randell Dutton, Acting Senior Safety Engineer

February 12, 2026

REQUEST FOR PRE-JOB (TUNNEL)

ATTACH COPY OF CLASSIFICATION AND DIESEL PERMIT

Company Name:_____

Phone_____FAX:_____

DATE FAXED: _____

PLEASE NOTE: THE BORING CONTRACTOR SHOULD SCHEDULE THE PREJOB AS FAR IN ADVANCE AS POSSIBLE – AT LEAST 3-4 DAYS IN ADVANCE. THE DIVISION REQUIRES THE JOB TO BE SET UP WHEN THE FIELD ENGINEER ARRIVES FOR THE PREJOB. THIS MEANS THAT THE BORE PIT HAS BEEN DUG AND PROPERLY GUARDED, THE CRANE IS IN PLACE AND READY TO LIFT, THE BORING MACHINE IS IN THE PIT AND READY TO GO, AND THE CREW IS READY TO BEGIN BORING THE TUNNEL. IF THERE IS A DELAY IN SETTING UP THE JOB, THE BORING CONTRACTOR SHOULD CONTACT THE DIVISION IMMEDIATELY.

PRE-JOB REQUEST DATE & TIME: _____

ON-SITE SUPERVISOR & CELL NO.: _____

CLASSIFICATION #: _____ **DIESEL PERMIT #:** _____

BORE DIAMETER AND LENGTH: _____ _____
(Diameter) (Length)

IS BORE ENTRY ANTICIPATED? YES NO
(Circle One)

You MUST contact the Division if entry is planned, REGARDLESS of the bore diameter.

MANNER OF EXCAVATION: _____

_____

JOB-SITE LOCATION AND DIRECTIONS: _____

_____

_____

GENERAL CONTRACTOR: _____

SUBMITTED BY: _____

REVIEWED BY: _____ **DATE:** _____

☐ *Mining & Tunneling Unit, District 1*
1750 Howe Ave., Suite 450
Sacramento, California 95825-2400
*(916) 574-2540; **FAX: (916) 574-2542***

☐ *Mining & Tunneling Unit, District 2*
6150 Van Nuys Blvd., Suite 310
Van Nuys, California 91401-3333
*(818) 901-5420; **FAX: (818) 901-5579***

☐ *Mining & Tunneling Unit, District 3*
464 West Fourth Street, Suite 354
San Bernardino, California 92401-1442
*(909) 383-6782; **FAX: (909) 388-7132***

APPENDIX E
ENVIRONMENTAL PERMITS

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EXHIBIT "A"

MITIGATION MONITORING AND REPORTING PROGRAM MCKINLEYVILLE COMMUNITY SERVICES DISTRICT SEWER HIGHWAY CROSSINGS RETROFIT PROJECT

To avoid, reduce or mitigate significant effects resulting from the proposed Project, Public Resources Code Section 21081.6 requires that monitoring and reporting procedures take place through implementation of a Mitigation Monitoring and Reporting Program (MMRP). **Table A-1** provides the MMRP for the proposed Project in accordance with those guidelines.

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
4.3 AIR QUALITY		
AQ-1 BMPs to Reduce Air Pollution The contractor shall implement the following air quality protection measures during construction: • All exposed surfaces (e.g., parking areas, staging areas, soil piles, active graded areas, excavations, and unpaved access roads) shall be watered two times per day in areas of active construction to control dust or as necessary. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph, unless the unpaved road surface has been treated for dust suppression with water, rock, wood chip mulch, or other dust prevention measures. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads or similar structures shall be laid as soon as possible after grading unless seeding or soil binders are used. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes. Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with the manufacturer's specifications.	MCSD's contractor	Project construction

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

	Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
	• Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The NCUAQMD's phone number shall also be visible to ensure compliance with applicable regulations.		
4.4	***BIOLOGICAL RESOURCES***		
BIO-1	**Avoidance and Minimization Measures to Protect Special Status and Nesting Birds** • Ground disturbance shall be conducted outside of the nesting bird season (which is generally assumed to primarily occur between March 15 – August 15). If ground disturbance or vegetation clearing cannot be confined to outside of the nesting bird season, a qualified biologist shall conduct a pre-construction survey in suitable habitat. This survey shall include a full area search for nesting activity within the Project Area and a buffered distance of 50 feet from the Project Area. In addition, this should include frequent visual raptor scans with binoculars within 300 feet of the Project Area. • If ground disturbance and vegetation removal work lapses for seven days or longer during the nesting season in the direct vicinity of the area surveyed, the qualified biologist shall conduct a supplemental nesting bird pre-construction survey before Project work is reinitiated. • If active nests are detected within the Project Area and 50-foot buffer or within the 300-foot area (for raptors), the biologist shall flag a buffer around each nest. Construction activities shall avoid nest sites until the biologist determines that the young have fledged or nesting activity has ceased. If nests are documented	MCSD's biologist	Within seven days of ground disturbance if work occurs between March 15 and August 15. If work lapses in an area for seven days or longer than a new survey would be required.

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

	Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
	outside of the Project Area, but up to 300 feet of the Project Area, buffers would be implemented as needed. In general, the buffer size for common species would be determined on a case-by-case basis in consultation with CDFW (as needed) and, if applicable, with USFWS. Buffer sizes would take into account factors such as (1) noise and human disturbance levels at the construction site; (2) distance and amount of vegetation or other screening between the construction site and the nest; and (3) sensitivity of individual nesting species. • The qualified biologist shall monitor all nests at least once per week to determine whether birds are being disturbed. If signs of disturbance or distress are observed, the qualified biologist shall immediately implement adaptive measures to reduce disturbance. These measures may include, but are not limited to, increasing buffer size, and/or halting disruptive construction activities in the vicinity of the nest until fledging is confirmed or nesting activity has ceased.		
BIO-2	**Avoidance and Minimization Measures to Protect Special Status Bats** If trees are to be removed during any season, a phased removal of trees shall be conducted where selected limbs and branches not containing cavities or peeled bark are removed on the first day, with the remainder of the tree removed on the second day. If construction occurs during the bat maternity season (generally May 1 through August 30), a qualified bat biologist shall conduct surveys within suitable habitat for special status bats. Survey methodology shall include visual examination with binoculars and may optionally utilize ultrasonic detectors to determine if special status bat species utilize the vicinity. Surveys shall be conducted by a qualified biologist within	MCSD's biologist	Within seven days of ground disturbance if work occurs between May 1 and August 30.

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

	Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
	seven days prior to construction in any areas where potential maternity roosts may be disturbed/removed.		
BIO-3	**Avoidance and Minimization Measures to Protect North American Porcupine** Steep-sided excavations capable of trapping mammals shall be ramped or covered if left overnight. Project personnel are not permitted to have pets (i.e., dogs) in the Project Area during construction. No hazardous materials (including anticoagulant rodenticides) or other potentially injurious materials attractive to mammals shall be utilized or left unattended during construction or operation activities. Trash shall be placed in receptacles and removed from the Project Area daily at the end of the work shift to avoid being left on-site overnight.	MCSD's contractor	During construction
BIO-4	**Avoidance and Minimization Measures to Protect Special Status Amphibian, Reptiles, and Fish** No more than 48 hours prior to commencement of ground disturbance within 50 feet of suitable reptile and/or amphibian habitat (e.g., Norton Creek riparian corridor, other riparian areas, damp meadows), a qualified biologist shall perform a pre-construction survey for Northwestern Pond Turtles and Northern Red-legged Frogs and shall relocate any individuals or egg masses that occur within the work-impact zone to nearby suitable habitat. In the event that a Northwestern Pond Turtle or Northern Red-legged Frog is observed in an active construction zone, the contractor shall halt construction activities in the immediate area where observed and the turtle or shall be moved to a safe location in similar habitat outside of the construction zone.	MCSD's biologist	Within 2 days of ground disturbance.

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

Monitoring Measure		Individual Responsible for Implementing	Timing of Initial Action
	If water is present, a qualified biologist will determine if state of federally-listed fish species are present prior to work initiation. • If state or federally-listed fish species are not present, construction will progress following the protocol for isolation, species relocation, and dewatering as established in the Watercourse Protection Plan. • If state or federally-listed fish species are present, construction will not progress until consultation with the CDFW under the California Endangered Species Act (CESA) and the National Marine Fisheries Service (NMFS) under Section 7 of the federal Endangered Species Act is complete. Construction shall adhere to all CDFW and NMFS conditions, as well as permit conditions from the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and the County of Humboldt under their Local Coastal Program authority.		
BIO-5	**Avoidance and Minimization Measures to Protect Environmentally Sensitive Habitat Areas** Construction within vegetation communities shall be avoided to the greatest extent practicable. If impacts are unavoidable and individual trees must be limbed or removed, mitigation of individual native trees over six inched DBH shall occur at a minimum ratio of 1:1. On-site locations for mitigation shall be prioritized. If suitable locations for on-site mitigation are not feasible, off-site mitigation shall occur within the McKinleyville Community Forest, with an emphasis on siting in riparian corridors. Following construction, the disturbed understory shall be restored with appropriate native cover via seeding or container planting.	MCSD	Pre-construction

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
BIO-6 Avoidance and Protection of Wetlands and Jurisdictional Waters The Project shall implement the following avoidance and protection measures for juxtaposed Coastal Act wetlands, Waters of the United States, and Waters of the State. • The Project shall attempt to avoid or minimize impacts to wetlands/waters to the greatest extent feasible in the final design plans. • Juxtaposed wetlands (not proposed for disturbance) shall be clearly identified in the construction documents and reviewed by the District prior to issuing for bid to ensure they are clearly marked as equipment exclusion zones during construction. • Suitable perimeter control measures, such as silt fences, or straw wattles shall be placed below all construction activities at the edge of surface water features to intercept sediment before it reaches the waterway. These measures shall be installed prior to any clearing or grading activities. • Wetlands temporarily disturbed during Project construction shall be restored to pre-Project topography and seeded with a California native grass seed mix or planting suitable native riparian species. • If a permanent wetland impact cannot be avoided, then the Project shall compensate for impacts to identified wetlands through creation of wetlands at a ratio acceptable to jurisdictional agencies. A Mitigation and Monitoring Plan shall be prepared in coordination with jurisdictional agencies. The Mitigation and Monitoring Plan shall identify the location(s), size, and type of mitigatory wetlands. The Mitigation and Monitoring Plan shall also identify acceptable plant pallets and requirements to align with groundwater connectivity, a site protection instrument, numeric	MCSD	Pre-construction

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
success criteria, monitoring methods, and reporting requirements/schedules. Compensation for wetlands shall occur so there is no net loss of wetland habitat at ratios to be determined in consultation with jurisdictional agencies. • Where in-channel work in the unnamed tributary of Norton Creek is required to implement the Watercourse Protection Plan, all disturbance will be limited to the minimum area necessary and hand labor will be used in lieu of heavy equipment to further minimize disturbance to the watercourse unless it is infeasible to do so. • In-channel work in the unnamed tributary shall be permitted by jurisdictional agencies and permit requirements shall be adhered to. All impacts to the unnamed tributary shall be temporary.		
4.5 CULTURAL RESOURCES		
CR-1 Tribal Cultural Monitoring and Monitoring Plan A Monitoring Plan shall be drafted in consultation with the Blue Lake Rancheria, Wiyot Tribe, and Bear River Band of Rohnerville Rancheria. The Monitoring Plan shall include the following: • Specifics of post-implementation recording requirements; • How discoveries will be addressed; • How collections will be curated or reburied; and • Information to consult with the Native American Heritage Commission to determine the most likely descendant for the site may also be appropriate and will assist the consultation process should human remains be inadvertently discovered.	MCSD in coordination with the Blue Lake Rancheria, Wiyot Tribe and Bear River Band of Rohnerville Rancheria.	Pre-construction and during construction

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

	Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
	All ground disturbing work shall be monitored by a Tribal Cultural Monitor who will ensure the proper treatment of inadvertently discovered resources in accordance with the Monitoring Plan.		
CR-2	**Avoidance and Minimization for Exclusion Fencing** Protective fencing shall be placed along each side of the access road entering and exiting the Southern Crossing Site to both define the access route and prevent incursion into the archaeological resources. The protective fencing shall extend five meters beyond the entrance and exit of the site boundary, shall be installed prior to commencement of Project activities, and remain in place for the duration of all Project activities.	MCSD's contractor	Pre-construction and during construction
CR-3	**Avoidance and Minimization for Vehicle Access** In the event of wetted conditions of the access road for the western portion of the Southern Crossing Sites, tracked vehicles shall be prohibited until conditions have dried.	MCSD's contractor	Pre-construction and during construction
CR-4	**Inadvertent Discovery of Archaeological Material** A pre-construction meeting shall be held with field contractors, where the protocols for inadvertent discovery (described below) shall be communicated. If cultural materials for example: chipped or ground stone, historic debris, building foundations, or bone are discovered during ground disturbance activities, work shall be stopped within 20 meters (66 feet) of the discovery, per the requirements of CEQA (Title 14 CCR 15064.5 (f)). Work near the archaeological finds shall not resume until a professional archaeologist, who meets the Secretary of the Interior's Standards and Guidelines, has evaluated the materials	MCSD's contractor	Pre-construction and during construction

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

	Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
	and offered recommendations for further action. Tribal representatives shall be notified.		
CR-5	**Inadvertent Discovery of Human Remains** If human remains are discovered during Project construction, work shall stop at the discovery location, within 66 feet, and any nearby area reasonably suspected to overlie adjacent to human remains (PRC, Section 7050.5). • Notification shall be made to the Humboldt County Coroner (CCR 15064.5(e) (1) (A); HSC Sec.7050.5). • Notification shall also be made to the three Wiyot Tribes (the Bear River Band of the Rohnerville Rancheria, the Blue Lake Rancheria, and the Wiyot Tribe of Loleta). • If the coroner determines the remains to be Native American, the Coroner shall contact the NAHC within 24 hours and collaboratively determine the Most Likely Descendant (CCR 15064.5(e)(1)(B)). The descendants or most likely descendants of the deceased shall be contacted, and work shall not resume until they have made a recommendation to the landowner or the person responsible for the excavation work for means of treatment and disposition, with appropriate dignity, of the human remains and any associated grave goods, as provided in PRC, Section 5097.98.	MCSD's contractor	During construction
4.7	***GEOLOGY AND SOILS***		
GEO-1	**Inadvertent Discovery of Paleontological Resources** In the event that fossils are encountered during construction (i.e., bones, teeth, or unusually abundant and well-preserved invertebrates	MCSD's contractor	Project construction

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
or plants), construction activities shall be diverted away from the discovery within 50 feet of the find, and a professional paleontologist shall be notified to document the discovery as needed, to evaluate the potential resource, and to assess the nature and importance of 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.		

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
4.10 HYDROLOGY AND WATER QUALITY		
HWQ-1 Development of a HAB Hydrofracture Contingency Plan To avoid potential impacts related to a frac-out, construction specifications shall require preparation of a HAB Hydrofracture Contingency Plan, which shall be approved by the District and in place prior to construction. The Plan shall include an anticipated drilling mud design that provides engineering properties and the anticipated fluid pressure required as the pilot hole is incrementally advanced in approximately 10-meter (30-foot) increments. The contractor shall be required to monitor and record the driller's mud composition, drill fluid pressure and volumes, and have an inadvertent return contingency plan and associated equipment to minimize impacts. The driller's mud, spoils, water, and all other waste materials are to be legally disposed with weight or volume tickets confirming legal disposal. The Plan shall include visual monitoring, monitoring pressures and volumes, observation during drilling, standards and specification for a four-hour shutdown minimum if frac-out occurs to allow ground to heal, cleanup plan, frac-out tank or vac truck (placed in strategic locations), and roles and responsibilities in the event of a frac-out event. The Plan shall also include the Watercourse Protection Plan that must be implemented during construction at the unnamed tributary of Norton Creek.	MCSD's contractor	Project construction
EXISTING REGULATIONS/STANDARD BMPS:		
Environmental Protection Action 1 – Stormwater Pollution Prevention Plan	MCSD's contractor	Pre-construction

TABLE A-1
MITIGATION MONITORING AND REPORTING PROGRAM

Monitoring Measure	Individual Responsible for Implementing	Timing of Initial Action
The Project would obtain coverage under the SWRCB, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activities (General Permit). The District would submit permit registration documents (notice of intent, risk assessment, site maps, SWPPP, annual fee, and certifications) to the SWRCB. The SWPPP would address pollutant sources, erosion control measures, and other requirements specified in the Order. The SWPPP would include erosion and sediment control measures, dust control practices to prevent wind erosion, sediment tracking, and dust generation by construction equipment. A Qualified SWPPP Practitioner would oversee implementation of the Project SWPPP, including visual inspections, sampling and analysis, and ensuring overall compliance.		and during construction

PLANNING AND BUILDING DEPARTMENT
PLANNING DIVISION
COUNTY OF HUMBOLDT
3015 H Street, Eureka, CA 95501
Phone (707) 445-7541
www.humboldtgov.org/156

Planning Division Decision Packet

The following packet of information includes your Planning Division permit results. **Please review the enclosed permit packet carefully.** The packet contains important information such as appeal periods, permit conditions, and the expiration date for your permit(s). Please take particular note of the following:

1. **Your permit is subject to one or more appeal periods.** Your permit is not effective until all appeal periods have ended. See appeals procedure information included in this packet.

2. **All permit conditions must be completed prior to the expiration date.** Your permit(s) may also include conditions from other state or local agencies. If you have questions or need assistance, please contact the specific agency or department that issued the conditions.

3. **Proof of completion is required for most permit conditions**. For efficient staff review of condition completion, please consolidate proof of completion for all conditions into one package.

4. **You are responsible for tracking the expiration date of your permit(s).** An extension process is available if you need more time.

5. **Additional federal, state or local regulatory requirements may apply to your project.** These requirements may be administered by agencies other than the Planning Division, including any mitigation monitoring. It is your responsibility to obtain all necessary approvals before starting your project.

6. **Call your assigned planner if you have any questions.** Your assigned planner's contact information is provided below.

Michael Holtermann, Associate Planner
Phone: 707-268-3737
mholtermann@co.humboldt.ca.us

CURRENT PLANNING DIVISION
PLANNING AND BUILDING DEPARTMENT
COUNTY OF HUMBOLDT

3015 H Street, Eureka, CA 95501
Phone (707) 445-7541
http://www.humboldtgov.org/156

Applicant	**Owner**	**Agent**
McKinleyville Community Services District Pat Kaspari PO Box 2037 McKinleyville CA, 95519	See Attachment 1C	GHD, Inc. Andrea Hilton PO Box 1010 Eureka CA 95502

Notice of Zoning Administrator Decision

Date March 20, 2026

Assessor Parcel No.: Listed in Attachment 1C

Permit: PLN-2025-19446

Contact: Michael Holtermann - 268-3737

Description
A Coastal Development Permit (CDP) and Special Permit (SP) for McKinleyville Community Services District to retrofit the three U.S. 101 sewer crossings that drain wastewater from the east side of U.S. 101 to the west side where the District's treatment facility is located. A Special Permit is required for major vegetation removal to facilitate the retrofit. The proposed replacement method for each highway crossing is Horizontal Auger Boring (HAB). A previous CDP (PLN-2025-19282) authorized geotechnical drilling to determine appropriate design parameters. The retrofitted sewer crossings would increase earthquake resiliency of the utility above current conditions.

Decision
The project was approved by the Zoning Administrator on March 19, 2026 by Resolution **26-047** and is subject to the attached Conditions of Approval.

Appeals
This project may be appealed by any aggrieved person within **10 working** days. The last day to appeal to the Board of Supervisors is 5:00 pm **April 3, 2026**. Additional information regarding appeals is included with this notice.

Conditions of Approval
Please review these conditions carefully as other permits may be required before the project

commences. In accordance with County Code, this approval may be revoked or rescinded, in whole or in part, if certain grounds are found to exist (See Humboldt County Code §312-14).

California Coastal Commission Appeal
This project is subject to a California Coastal Commission appeal period which begins at the end of the County appeal period. If appealed, the Coastal Commission may deny the project or impose other conditions of approval on the project.

Effective Date
If no appeal is initiated, the day after all appeal periods end will become the effective date of the permit. If an appeal has been initiated the effective date will depend on the outcome of the appeal.

Expiration Date
You will receive an expiration letter stating the effective date and the expiration date at the end of the Coastal Commission appeal period.

Extensions
If the conditions for your project cannot be met before the expiration date, you may apply for an extension with the Planning Division. Extension applications must be submitted with the appropriate fees before the permit expiration date. If the permit expires, a new permit application must be filed and accompanied by applicable fees. The new permit may be subject to different processing requirements and standards. Contact your assigned planner if you have any questions about extensions.

Changes or Modifications to Project
If your project needs minor changes or major modifications, review and approval of the project by the Planning Division is required. Applications for changes or modifications must be filed and accompanied by applicable fees. Contact your assigned planner if you think your project needs to be changed or modified.

RESOLUTION OF THE ZONING ADMINISTRATOR

OF THE COUNTY OF HUMBOLDT

Resolution Number: 26-047

Record Number: PLN-2025-19446

Assessor's Parcel Numbers: 508-031-001-000, 508-031-004-000, 508-031-008-000, 508-073-002-000, 508-091-037-000, 508-091-037-0000, 510-221-002-000, 510-271-079-000, 510-451-043-000, 511-011-008-000, 511-011-024-000, 511-011-025-000, 511-021-060-000, 511-031-022-000, 511-031-060-000

RESOLUTION BY THE ZONING ADMINISTRATOR OF THE COUNTY OF HUMBOLDT CERTIFYING COMPLIANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT AND CONDITIONALLY APPROVING THE MCKINLEYVILLE COMMUNITY SERVICES DISTRICT SEWER HIGHWAY CROSSINGS RETROFIT COASTAL DEVELOPMENT PERMIT AND SPECIAL PERMIT.

WHEREAS, McKinleyville Community Services District has submitted an application and evidence in support of approving a Coastal Development Permit (CDP) and Special Permit (SP) to retrofit the three U.S. 101 sewer crossings that drain wastewater from the east side of U.S. 101 to the west side where the District's treatment facility is located and for major vegetation removal to facilitate the retrofit; and

WHEREAS, the County Planning Division has reviewed the submitted application and evidence and has referred the application and evidence to involved reviewing agencies for site inspections, comments, and recommendations; and

WHEREAS, the McKinleyville Community Services District, as the lead agency under CEQA, has prepared a Mitigated Negative Declaration for the proposed project; and

WHEREAS, Attachment 2 in the Planning Division staff report includes evidence in support of making all of the required findings for approving the proposed Coastal Development Permit and Special Permit; and

WHEREAS, the Humboldt County Zoning Administrator held a duly-noticed public hearing on March 19, 2026, and reviewed, considered, and discussed the application for the Coastal Development Permit and Special Permit, and reviewed and considered all evidence and testimony presented at the hearing.

Now, THEREFORE BE IT RESOLVED, that the Zoning Administrator makes all the following findings:

1. **FINDING:** A Coastal Development Permit (CDP) and Special Permit (SP) for McKinleyville Community Services District to retrofit the three U.S. 101 sewer crossings that drain wastewater from the east side of U.S. 101 to the west side where the District's treatment facility is located. A Special Permit is required for major vegetation removal to facilitate the retrofit. The proposed replacement method for each highway crossing is Horizontal Auger Boring (HAB). A previous CDP (PLN-2025-19282) authorized geotechnical drilling to determine appropriate design parameters. The retrofitted sewer crossings would increase earthquake resiliency of the utility above current conditions.

EVIDENCE: a) Project File: PLN-2025-19446

2. **FINDING:** **CEQA**: The requirements of the California Environmental Quality Act have been met.

EVIDENCE: a) The McKinleyville Community Services District, as the lead agency under CEQA, has prepared a Mitigated Negative Declaration for the proposed project.

FINDINGS FOR COASTAL DEVELOPMENT PERMIT AND SPECIAL PERMIT

3. **FINDING:** The proposed development is in is in conformance with all applicable policies and standards in the McKinleyville Area Local Coastal Plan and McKinleyville Community Plan.

EVIDENCE: a) The subject properties are currently utilized for a variety of uses, including natural resources, agriculture exclusive/prime lands, residential low density, residential estates, commercial recreation, commercial services, and public facility. The proposed sewer retrofit will take place in existing easements and is a use accessory to the current uses of the subject properties. The purpose of the retrofit is to replace sewer crossings to increase earthquake resiliency of the utility.

b) The project will not add to nor subtract from the Housing

Inventory. The project permits the retrofit of existing sewer crossings and will not affect the existing residential, agricultural, commercial, and public use of the properties. The project is consistent with the County's Housing Element.

c) The applicant submitted a Biological Resources Report and Wetland Delineation Report assessing baseline environmental conditions. Two seasonally appropriate floristic surveys were conducted and no special status plants were detected in the project area. Special status bird species, mammals, and fish are known to be present in the Biological Study Area (BSA). Mitigation measures include avoidance and minimization (Mitigation Measures BIO-1 – BIO-6). The Initial Study/Mitigated Negative Declaration prepared by the McKinleyville Community Services District indicates impacts to any species identified as a candidate, sensitive, or special status species, riparian habitat or other sensitive natural communities, protected wetlands, or movement of migratory wildlife corridors will be less than significant with mitigation incorporated or will have no impact. The McKinleyville Community Plan allows development within wetland areas on existing parcels where the least environmentally damaging alternative development techniques is employed and where mitigation measures have been provided to fully offset any adverse effects. The McKinleyville Local Coastal Area Plan allows development in wetlands for incidental public services purposes.

d) A Cultural Resource Inventory Report was prepared for the project and concluded cultural resources are located within the Area of Potential Effects (APE) associated with the project. The report included management recommendations that have been included as recommended conditions of approval. The project was referred to Blue Lake Rancheria, Wiyot Tribe, Bear River Band of the Rohnerville Rancheria, and the Northwest Information Center. Tribal referral responses recommended inadvertent discovery protocol and, given presence of prehistoric sites of cultural significance, that a cultural monitor be located on site during any ground disturbance. Inadvertent discovery protocol and an on-site cultural monitor have been included as recommended conditions of approval.

e) There will be no significant change to visual resources resulting from the proposed project. The project would result in retrofits to existing sewer crossing. Project activities include vegetation and tree removal. Mitigation measures include replanting of any removed trees over 6 inches diameter at breast height. The project areas are not included in a coastal scenic view or coastal scenic area. The project as proposed will not have a significant impact on scenic coastal resources.

f) The McKinleyville Local Coastal Area Plan (MCAP) allows for the diking, filling, or dredging of wetlands for specific purposes. One of the allowed development types includes incidental public service purposes, including but not limited to burying cables or pipes, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects. The proposed work in the wetland areas includes trimming for access utilizing existing access roads and retrofit work and will be limited to areas of existing development. Creation and utilization of new access roads would result in adverse impacts to existing wetlands. The applicant proposes to replace any trees over 6 inches in diameter at breast height at a 1:1 ratio that are removed for access to the work site. Mitigation measures included in the Initial Study/Mitigated Negative Declaration indicate erosion control measures and BMPs would be utilized wherever ground disturbing work occurs in proximity to wetlands. Mitigation measures have been provided in the Initial Study/Mitigated Negative Declaration which concludes the activities will have a less than significant impact on wetlands. As the project proposes to utilize existing access roads and will limit work to existing developed areas, there is no less environmentally damaging alternative that would allow the retrofit of the existing sewer crossings.

g) Development setbacks below the minimum prescribed by the McKinleyville Local Coastal Area Plan may be permitted when the applicant demonstrates to the satisfaction of the County and CDFW that a setback less than prescribed will not result in adverse impacts to the wetland habitat and will be compatible with the continuance of such habitat. The project was referred to CDFW, who had conducted a thorough review of the Mitigated Negative Declaration prepared by the applicant and had nothing to add by the time the County referral request was sent. A review of the submitted documents, including the Initial Study and Mitigated Negative Declaration indicate the project as proposed including mitigation measures will not adversely impact wetland habitat and will be compatible with the continuance of the wetland habitat.

4. FINDING: The proposed development is consistent with the purposes of the existing zoning in which the sites are located and with Humboldt County Zoning Code.

EVIDENCE:

a) The project areas encompass lands Residential One-Family (R-1), Residential Single Family (RS-5, RS-30), Agriculture Exclusive (AE-60), and Commercial Recreation (CR). The project would authorize the retrofit of existing sewer crossings within existing easements, which will not conflict with the allowable uses of the zoning districts.

b) The proposed development is consistent with the purposes of the existing Airport Safety Review (AP), Noise Impact (N), Special Building Site (B3), Streamside Management Areas and Wetlands (WR), Flood Hazard Areas (F), and Streams and Riparian Corridor Protection (R) combining zones in which the sites are located. Technical documentation has been submitted showing that the retrofit is consistent with applicable development standards of the zone districts. As previously discussed, the project is not anticipated to have significant impacts on sensitive species, watercourses, or sensitive habitats, and, due to incorporated mitigation measures, it is anticipated there would be a low risk of impacting cultural resources.

c) Front, rear, and side yard setbacks are spaces unoccupied and unobstructed from the ground up except for landscaping or as specified elsewhere in the code. The proposed retrofits will be below ground surface and therefore are not subject to front, rear, and side yard setbacks.

d) Development within the one parameter wetlands identified in the Wetland Delineation Report is the least environmentally damaging feasible alternative. Mitigation measures are in place to protect functional capacity of the wetlands, and the project has been referred to CDFW for review and comment. No recommendations were received from CDFW.

e) Development is designed to prevent impacts that would significantly degrade wetland habitat areas, and are consistent with continuance of habitat areas. Biological productivity and quality of the identified wetlands will not be impaired as demonstrated by the Initial Study/Mitigated Negative Declaration prepared by the McKinleyville Community Services District.

f) State guidelines prescribe criteria for establishing buffer areas, including biological significance of adjacent lands, sensitivity of species to disturbance, susceptibility of the parcel to erosion, use of natural topographic features to locate development, use of existing cultural features to locate buffer zones, lot configuration and location of existing development, and type and scale of development proposed. Section 30233 of the Coastal Act allows for the diking, filling, or dredging of wetlands for specific purposes regardless of whether the wetland also meets the definition of ESHA. One of the allowed development types includes incidental public service purposes, including but not limited to burying cables or pipes, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects. The proposed work in the wetland areas include trimming for access utilizing existing access roads and retrofit work will be limited to areas of existing development. Creation and utilization of new access roads would result in adverse impacts to existing wetlands. The applicant proposes to

replace any trees over 6 inches in diameter at breast height at a 1:1 ratio that are removed for access to the work site. Mitigation measures included in the Initial Study/Mitigated Negative Declaration indicate erosion control measures and BMPs would be utilized wherever ground disturbing work occurs in proximity to wetlands. Mitigation measures have been provided in the Initial Study/Mitigated Negative Declaration which concludes the activities will have a less than significant impact on wetlands. As the project proposes to utilize existing access roads and will limit work to existing developed areas, there is no less environmentally damaging alternative that would allow the retrofit of the existing sewer crossings.

5. **FINDING:** Development permits shall only be issued for a lot that was created in compliance with all applicable state and local subdivision regulations.

EVIDENCE: a) The Coastal Development Permit will authorize PG&E to maintain their existing easements and does not authorize any structural development that would legitimize a parcel created in violation of the Subdivision Map Act.

6. **FINDING:** The project and the conditions under which it may be operated or maintained will not be detrimental to the public health, safety, or welfare or materially injurious to properties or improvements in the vicinity.

EVIDENCE: a) The project will not pose detrimental threats to properties in the vicinity, nor will it pose any kind of public health hazard. The proposed project will retrofit existing sewer crossings to increase earthquake resiliency of the utility above current conditions. The increased earthquake resiliency will reduce any existing threats to public health safety or welfare.

7. **FINDING:** The proposed development does not reduce the residential density for any parcel below that utilized by the Department of Housing and Community Development in determining compliance with housing element law.

EVIDENCE:

a) The subject properties are currently utilized for a variety of uses, including natural resources, agriculture exclusive/prime lands, residential low density, residential estates, commercial recreation, commercial services, and public facility. The proposed sewer retrofit will take place in existing easements and will not add new housing units, nor will the project preclude development of new housing units that would otherwise be allowed. The project is consistent with the County's Housing Element.

DECISION

NOW, THEREFORE, based on the above findings and evidence, the Humboldt County Zoning Administrator does hereby:

- Adopt the findings set forth in this resolution; and

- Conditionally approve the McKinleyville Community Services District Sewer Highway Crossings Retrofit Coastal Development Permit and Special Permit subject to the conditions of approval attached hereto as Attachment 1A.

Adopted after review and consideration of all the evidence on **March 19, 2026**.

I, John H. Ford, Zoning Administrator of the County of Humboldt, do hereby certify the foregoing to be a true and correct record of the action taken on the above-entitled matter by said Zoning Administrator at a meeting held on the date noted above.

John H. Ford, Zoning Administrator
Planning and Building Department

CONDITIONS OF APPROVAL
PLN-2025-19446

APPROVAL OF THE COASTAL DEVELOPMENT PERMIT AND SPECIAL PERMIT IS CONDITIONED UPON THE FOLLOWING TERMS AND REQUIREMENTS WHICH MUST BE FULFILLED.

1. All work shall be consistent with the approved Site Plan and Project Description. Major changes may necessitate a modification of this permit.

2. All activities related to the sewer crossing retrofit under this permit shall be conducted in strict conformance with the following:
    a. Biological Resources Evaluation prepared by GHD dated January 8, 2021
    b. Sewer Highway Crossings Retrofit Project Initial Study/Proposed Mitigated Negative Declaration prepared by GHD dated October 20, 2025.
    c. Phase 1 Cultural Resource Inventory Report prepared by DZC Archaeology and Cultural Resource Management dated January 2021 (on file and confidential)
    d. Extended Phase 1 Investigation prepared by Pacific Legacy, Inc. dated September 2023 (on file and confidential)

3. The applicant shall ensure that all required grading, building, plumbing, electrical, and mechanical permits and or Agricultural Exemption are obtained as necessary.

4. The applicant shall obtain an encroachment permit for any trenching locations or traffic control needed within the County Road right of way.

5. A cultural monitor shall be located on site during any ground disturbing activities.

Informational Notes:

1. The applicant is responsible for receiving all necessary permits and/or approvals from other state and local agencies. This permit shall expire and become null and void at the expiration of two (2) years after all appeal periods have lapsed (see "Effective Date"); except where construction under a valid building permit or use in reliance on the permit has commenced prior to such anniversary date. The periods within which construction or use must be commenced may be extended as provided by Section 312-10.5 of the Humboldt County Code.

2. The applicant is required to pay for permit processing on a time and material basis as set forth in the schedule of fees and charges as adopted by ordinance of the Humboldt County Board of Supervisors. The Department will provide a bill to the applicant after the decision. All outstanding Planning fees to cover the processing of the application to decision by the Hearing Officer shall be paid to the Humboldt County Planning Division, 3015 "H" Street, Eureka.

3. If cultural resources are encountered during project-related activities, the contractor on site shall cease all work in the immediate area and within a 50-foot buffer of the discovery location. A qualified archaeologist as well as the appropriate Tribal Historic Preservation Officer(s) are to be contacted to evaluate the discovery and, in consultation with the applicant and lead agency, develop a treatment plan in any instance where significant impacts cannot be avoided.

   The Native American Heritage Commission (NAHC) can provide information regarding the appropriate Tribal point(s) of contact for a specific area; the NAHC can be reached at 916-653-4082. Prehistoric materials may include obsidian or chert flakes, tools, locally darkened midden soils, ground stone artifacts, shellfish or faunal remains, and human burials. If human remains are found, California Health and Safety Code 7050.5 requires that the County Coroner be contacted immediately at 707-445-7242. If the Coroner determines the remains to be Native American, the NAHC will then be contacted by the Coroner to determine appropriate treatment of the remains pursuant to PRC 5097.98. Violators shall be prosecuted in accordance with PRC Section 5097.99

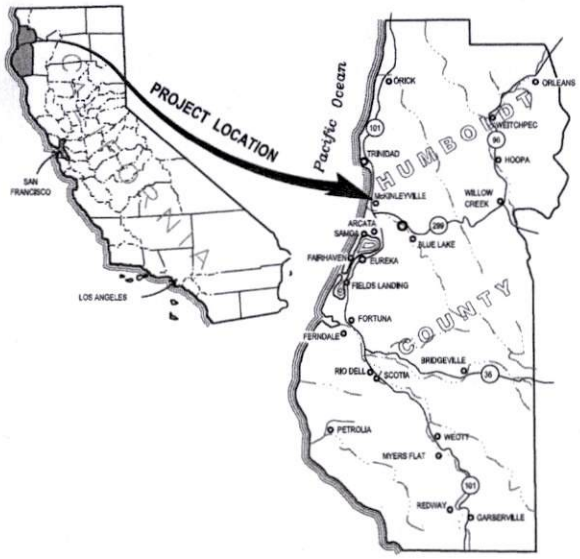
   The applicant is ultimately responsible for ensuring compliance with this condition.

McKINLEYVILLE COMMUNITY SERVICES DISTRICT
HIGHWAY SEWER CROSSING
PHASE 2

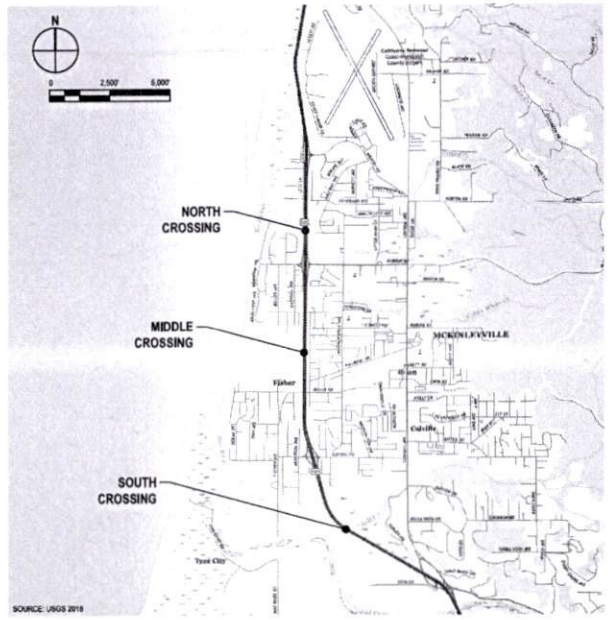
10/31/2025

APPROVED
MAR 19 2026
Humboldt County
PLANNING

AREA MAP



LOCATION MAP



PROJECT DIRECTORY

OWNER: MCKINLEYVILLE COMMUNITY SERVICES DISTRICT

PAT KASPARI, PE
GENERAL MANAGER
1656 SUTTER RD, MCKINLEYVILLE CA 95519
707-839-3251

CIVIL ENGINEER: GHD INC.

LUKE HALONEN, PE
718 THIRD ST, EUREKA CA 95501
707-267-2229

SHEET INDEX

SHEET	SHEET NO.	SHEET TITLE
1	G-001	COVER SHEET
2	G-002	ABBREVIATIONS, SYMBOLS, AND SHEET INDEX
3	G-003	GENERAL NOTES
4	G-004	PROJECT OVERVIEW
5	C-101	STAGING AND ACCESS PLAN - NORTH CROSSING
6	C-102	STAGING AND ACCESS PLAN - MIDDLE CROSSING
7	C-103	STAGING AND ACCESS PLAN - SOUTH CROSSING
8	C-104	PLAN AND PROFILE - NORTH CROSSING
9	C-105	PLAN AND PROFILE - MIDDLE CROSSING
10	C-106	PLAN AND PROFILE - SOUTH CROSSING
11	C-501	CIVIL DETAILS 1 OF 4
12	C-502	CIVIL DETAILS 2 OF 4
13	C-503	CIVIL DETAILS 3 OF 4
14	C-504	CIVIL DETAILS 4 OF 4

PRELIMINARY

No.	Issue		Checked	Approved	Date
B	90% DESIGN REVIEW	LH	PS		10/31/2025
A	30% DESIGN REVIEW	CC	PS		12/18/2020

Author E. STOCKWELL | Drafting Check L. HALONEN | Project Manager P. SULLIVAN
Designer R. RIOS | Design Check L. HALONEN | Project Director S. ALLEN

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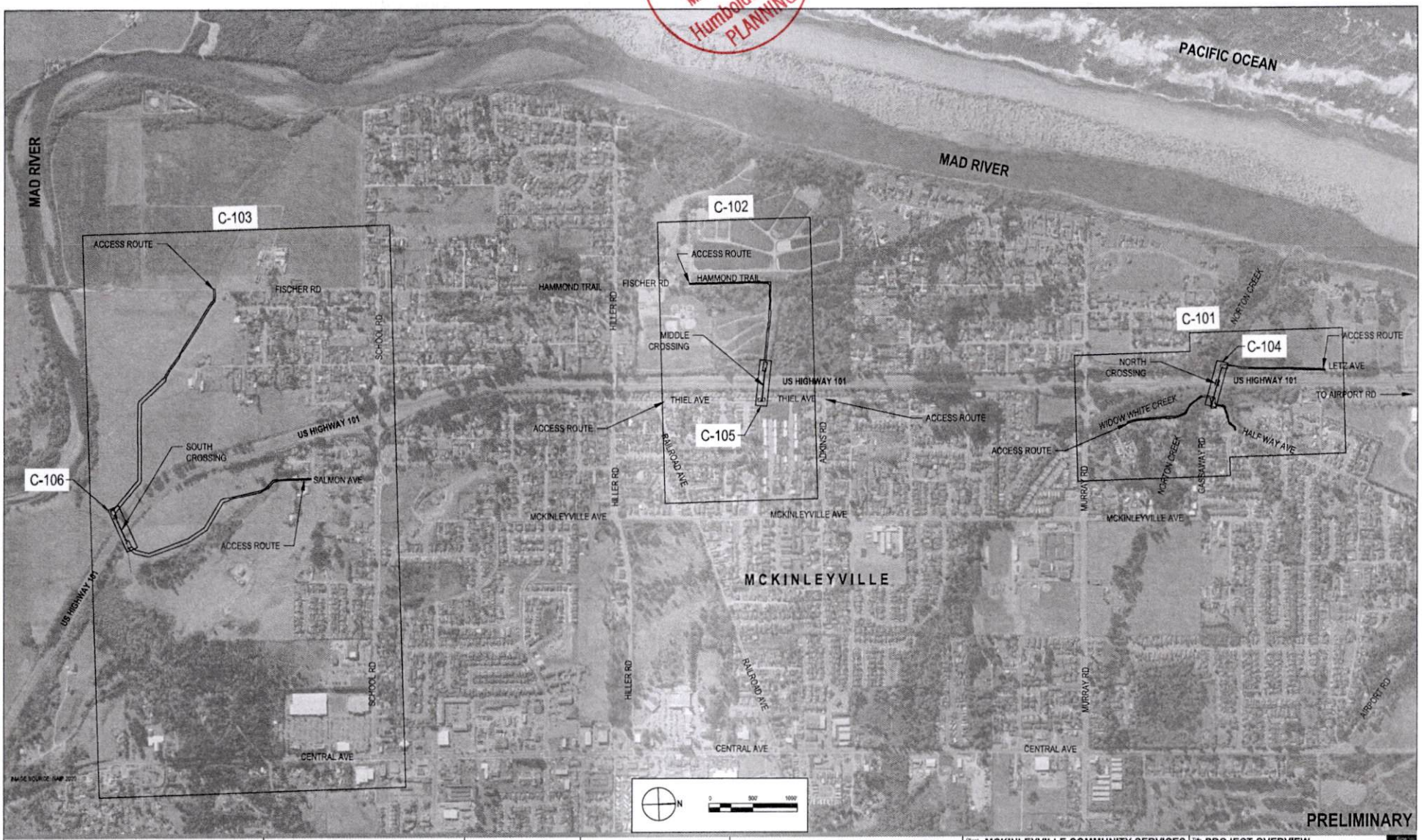
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Client: MCKINLEYVILLE COMMUNITY SERVICES DISTRICT
Project: HIGHWAY SEWER CROSSING PHASE 2
Title: COVER SHEET
Size: ANSI D
Project No.: 12669030
Date: 10/31/2025
Scale: AS SHOWN
Sheet No.: G-001
Sheet: 1 of 14

File Date: 31 October 2025 - 2:58 PM
Plotted By: Luke Halonen

APPROVED
MAR 19 2026
Humboldt County
PLANNING



No.	Issue	Checked	Approved	Date
B	60% DESIGN REVIEW	LH	PS	10/31/2025
A	30% DESIGN REVIEW	CC	PS	12/19/2025

Author E. STOCKWELL | Drafting Check L. HALONEN | Project Manager P. SULLIVAN
Designer R. RIOS | Design Check L. HALONEN | Project Director S. ALLEN

Bar is one inch on original size sheet
0 1"

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Client: MCKINLEYVILLE COMMUNITY SERVICES DISTRICT
Project: HIGHWAY SEWER CROSSING PHASE 2
Project No.: 12669030 | Date: 10/31/2025 | Scale: AS SHOWN

Title: PROJECT OVERVIEW
Size: ANSI D
Sheet No.: G-004
Sheet: 4 of 14

Plot Date: 31 October 2025 - 3:01 PM | Plotted By: Luke Halonen | Filename: \ghdnet\ghd\US\Eureka\Projects\12669030\Digital_Design\ACAD\Sheets\12669030_G-004.dwg

Attachment 1C - Project Parcels and Owners

McKinleyville Community Services District Sewer Crossing Retrofit PLN-2025-19446

APN	Parcel Size (Acres)	Owner's Name	Site Address	Owner Address
511-031-060-000	0.87	Reed Marty M & Lois J	3030 HALFWAY AV	3030 Halfway Ave
511-031-022-000	1.46	Flores David & Holm Rachel	3036 HALFWAY AV	3036 Halfway Ave
510-271-079-000	4.53	Mckinleyville Community Serv Dist	N/A	Po Bx 2037
511-011-008-000	0.38	Mckinleyville Community Services Distpl	N/A	1656 Sutter Rd
510-221-002-000	56.09	Mckinleyville Comm Services District	880 COLUMBUS AV	1656 Sutter Rd
508-091-037-000	34.35	Mckinleyville Community Services District	1300 ANDERSON AV	Po Box 2037
508-031-001-000	38.0	Mckinleyville Community Services District	N/A	Po Box 2037
511-021-060-000	21.10	Gazaway Cassandra R Suctr	1085 MURRAY RD	1085 Murray Rd
510-451-043-000	0.1	Humboldt County Of	N/A	1106 2Nd St
508-031-008-000	13.27	Morais Properties	N/A	1364 Silva Rd
508-073-002-000	53.77	Furtado J L Inc	N/A	3329 Halfway Ave
508-031-004-000	8.67	J L Furtado Inc	N/A	3329 Halfway Ave
511-011-024-000	6.81	Slagle Alvin L & Diane M Tr	N/A	2130 Quail Point Ct
511-011-025-000	23.76	Slagle Alvin L & Diane M Tr	N/A	2130 Quail Point Ct



APPROVED
MAR 19 2026
Humboldt County
PLANNING

Attachment 1D
Parcel APNs , General Plan, Zoning, Coastal Zone Jurisdiction

McKinleyville Community Services District Sewer Crossing Retrofit PLN-2025-19446

APN	(Acres)	GP Designation	Zoning	Coastal Jurisdiction	Area Plan
511-031-060-000	0.87	RL;RL1-7	RS-5/AP,N	Local/Appeal Inland	MCAP
511-031-022-000	1.46	RL;RL1-7	RS-5/AP,N;R-1-T-AP	Local Inland	MCCP, MCAP
510-271-079-000	4.53	(RAILROAD),RE	HAMMOND TRAIL	Appeal	MCAP
511-011-008-000	0.38	CR	CR/AP,F,R	Appeal	MCAP
510-221-002-000	56.09	PF;RE	RS20;RS20/G;R-1B3NWR	Appeal Inland	MCCP, MCAP
508-091-037-000	34.35	AEP	AE-60/A,F,R	Appeal	MCAP
508-031-001-000	38.00	AEP	AE-60/A,F,R	Appeal/State	MCAP
511-021-060-000	21.10	CR;CS,RL1-7,AP	CR/F;C1APNWR;R1TAPN+	Local/Appeal Inland	MCCP, MCAP
510-451-043-000	0.12	RL1-7	R-1-N	Inland	MCCP
508-031-008-000	13.27	AEP	AE-60/A,F,R;NR/R	Local/Appeal/State	MCAP
508-073-002-000	53.8	AEP,NR,RL	AE-60	Local/Appeal	MCAP
508-031-004-000	8.67	AEP,NR	AE-60	Local/Appeal	MCAP
511-011-024-000	6.81	NR	HAMMOND TRAIL	Appeal	MCAP

511-011-025-000	23.76	NR	HAMMOND TRAIL	Appeal	MCAP

APPEALS OF ZONING ADMINISTRATOR ACTIONS

WHO MAY APPEAL?

County Ordinance and State Law provides the opportunity for the applicant or any other person who disagrees with the Zoning Administrator's decision to approve, conditionally approve, or deny a project, to appeal that decision to the Board of Supervisors.

WHAT CONSTITUTES A FORMAL APPEAL?

All appeals must be submitted in writing and must be accompanied by the fee established for appeals by the Board of Supervisors. The person filing the appeal shall state specifically why the decision of the Zoning Administrator is not in accord with the standards and regulations of the zoning ordinances, or why it is believed that there was an error or an abuse of discretion by the Zoning Administrator. A copy of the receipt can be used as proof of payment when filing with the Clerk of the Board.

WHAT IS THE FEE FOR FILING AN APPEAL?

The County's adopted schedule of fees and charges establishes fees for appeals of Zoning Administrator actions. Appeal fees include charges by other County departments (e.g., Division of Environmental Health or Public Works Land Use). If the appeal does not involve issues within the jurisdiction of a particular County department, it may be possible to reduce the appeal fee by the amount normally collected. This can be done by providing a written fee waiver authorization from that department with the appeal request. Please contact the Planning Division for updated fee information.

WHERE IS AN APPEAL FILED?

The appeal must be filed with the Planning Division at the Clark Complex, 3015 H Street, Eureka, CA 95501. However, for subdivisions and subdivision map extensions not involving property in the Coastal Zone, a copy of the appeal and proof of payment of the appeal fees must also be filed with the Clerk of the Board of Supervisors, in Room #111 of the Humboldt County Courthouse, 825 Fifth Street, Eureka, CA 95501.

HOW LONG DO I HAVE TO FILE AN APPEAL?

Subdivisions, discretionary permits and variances have different appeal filing periods and procedures under the law. Please refer to the back of this sheet for the specific ordinance requirements. The following information may be used for guidance.

Permit Type	Appeal Filing Period	Where To File
Subdivisions	10 calendar days	Planning Division and Clerk of the Board
Subdivision Map Extensions	15 calendar days (Appealable only if denied)	Planning Division and Clerk of the Board
Subdivisions in the Coastal Zone	10 calendar days	Planning Division only
Lot Line Adjustments	10 calendar days	Planning Division only
Permits and Variances In the Coastal Zone	10 working days	Planning Division only
Permits and Variances outside of the Coastal Zone (Inland Zoning)	10 working days	Planning Division

"Working Day" appeal periods begin the very next business day after the decision is made and end at 5:00 p.m. on the tenth (10th) business day counting sequentially (weekends and County-recognized holiday days are excluded as they are not normal working days).

"Calendar Day" appeal periods begin the very next day after the decision is made and end at 5:00 p.m. on the final appeal day by counting sequentially, unless the last day is a weekend or County-recognized holiday, then the appeal period would end on 5:00 p.m. the next business day following the weekend or County-recognized holiday.

WHAT IF THE "PROJECT" INVOLVES MULTIPLE PERMIT TYPES?

Different permit types have different appeal periods. If you wish to appeal a project as a whole, the most restrictive (i.e., shortest time period) appeal period must be used. If you wish to appeal a specific permit involved in the project, the appeal period for that specific permit must be followed. Failing to file an appeal in the correct timeframe can invalidate the appeal.

QUESTIONS?

For more information or if you have questions regarding the appeal process, contact the Planning Division at (707)445-7541.

REGULATIONS GOVERNING APPEALS OF DECISIONS
BY THE HEARING OFFICER

COASTAL ZONING REGULATIONS

Section 312-13. Appeal Procedures.

Appeals to the Board of Supervisors. Any person, as defined in Chapter 2, aggrieved by an action or the Hearing Officer may appeal such action to the Board of Supervisors by filing a notice of appeal with the Planning Division of the Planning and Building Department within ten (10) working days of said action. Upon receipt of the notice of appeal, the Planning Division shall transmit to the Clerk of the Board a copy of the notice of appeal. An appeal fee as set by resolution of the Board of Supervisors shall be paid when the appeal is filed.

Grounds for Appeals. The Planning Division shall provide a standard form on which the appellant shall state specifically why the decision of the Hearing Officer is not in accord with the standards and regulations of the zoning ordinance, or why it is believed that there was an error or an abuse of discretion by the Hearing Officer.

INLAND (NON-COASTAL) ZONING REGULATIONS

Section 312-13. Appeals to the Board of Supervisors

Except as otherwise stated in this Code, any person, as defined in this Code, aggrieved by an action taken by the Hearing Officer on any completed application, may appeal such action to the Board of Supervisors by filing a notice of appeal with the Department within ten (10) working days of said action. Appeals on Coastal Development Permits for subdivisions shall be filed within ten (10) calendar days of the decision of the Hearing Officer. Upon receipt of the notice of appeal, the Planning Division of the Planning and Building Department shall transmit to the Clerk of the Board a copy of the notice of appeal. An appeal fee as set by resolution of the Board of Supervisors shall be paid when the appeal is filed. This section does not apply to a rezoning or an amendment to this division.

SUBDIVISION REGULATIONS AND STATE SUBDIVISION MAP ACT

325-8. APPEALS (Subdivision Projects)

The subdivider, any interested person or any public entity may appeal any action of the Advisory Agency to the Board of Supervisors. (Note: Appeals are processed in accordance with the following sections of the California Government Code: §66451.3, 66452.5, 66452.6(e) and 66474.7.)

325.5-10. APPEALS (Lot Line Adjustments)

Any person aggrieved by an action of the Zoning Administrator may take an appeal to the Board of Supervisors by filing a notice of appeal with the Planning Division of the Planning and Building Department and with the clerk of the Board of Supervisors within ten (10) days of said action. The notice of appeal filed with the Planning Division shall be accompanied by a fee set by resolution of the Board of Supervisors sufficient to cover the cost of processing the application for appeal. Upon receipt of the notice of appeal, the Planning Division shall forthwith transmit to the Board of Supervisors all the papers constituting the record upon which the action appealed from was taken.

COUNTY OF HUMBOLDT

JOHN BARTHOLOMEW
TREASURER—TAX COLLECTOR
825 Fifth Street Room 125
Eureka, California 95501

Phone: 707-476-2450
Fax: 707-445-7608
Toll Free: 877-897-5692
email: taxinfo@co.humboldt.ca.us

TAX COLLECTION INFORMATION
Important: all taxes and assessments must be paid in full before any parcel changes are recorded.

SUBDIVISION OR COMBINING LAND PARCELS
To complete the recording of any map change (subdivision or any combinations), the Treasurer-Tax Collector's office should be contacted to determine (1) if any taxes or assessments need payment and (2) if a tax performance bond is necessary. There is an application fee of $140.00 to provide this information.

If the map is recorded between:

January 1 and October 31:

A. All delinquent property taxes (secured and unsecured) must be paid in full.
B. Bonded assessments usually must be paid in full.
C. Current fiscal year taxes must be paid in full.
D. A deposit in the estimated amount of the tax for the next fiscal year, which becomes a lien on January 1, must be posted with the Treasurer.

November 1 and December 31:

A. All delinquent property taxes (secured and unsecured) must be paid in full.
B. Bonded assessments usually must be paid in full.
C. Current fiscal year taxes must be paid in full.

LOT LINE ADJUSTMENTS
It is to your benefit to make sure all taxes through the current tax year are paid before completing a lot line adjustment. Unpaid taxes could "cloud" title to all involved properties and could prevent combining property to simplify tax assessment. The Treasurer-Tax Collector's office should be contacted to determine if any taxes are unpaid.

FOR MORE INFORMATION
Please contact the Humboldt County Tax Collector's office at 707-476-2450, from 8:30 am to noon, and 1:00 pm to 5:00 pm, Monday through Friday.

PLANNING AND BUILDING DEPARTMENT
COUNTY OF HUMBOLDT
CURRENT PLANNING DIVISION

3015 H Street, Eureka, CA 95501
Phone (707) 445-7541
http://www.humboldtgov.org/156

California Coastal Commission
1385 8th Street, Ste 130
Arcata, CA 95521

Notice of Final Action Taken

Date: April 7, 2026 **Appealable Status** Appealable

Applicant: McKinleyville Community Services District
Pat Kaspari
PO Box 2037
McKinleyville CA, 95519

Assessor Parcel Number: Listed in Attachment 1C

Record Number: PLN-2025-19446

Contact: Michael Holtermann - 268-3737

Description
A Coastal Development Permit (CDP) and Special Permit (SP) for McKinleyville Community Services District to retrofit the three U.S. 101 sewer crossings that drain wastewater from the east side of U.S. 101 to the west side where the District's treatment facility is located. A Special Permit is required for major vegetation removal to facilitate the retrofit. The proposed replacement method for each highway crossing is Horizontal Auger Boring (HAB). A previous CDP (PLN-2025-19282) authorized geotechnical drilling to determine appropriate design parameters. The retrofitted sewer crossings would increase earthquake resiliency of the utility above current conditions.

Action Taken
Following a noticed Public Hearing the County of Humboldt Zoning Administrator approved the referenced application on March 19, 2026.

Appeal Completion
The appeal period for this project has been completed and no appeal was received.

Effective Date

Coastal Development Permit record number PLN-2025-19446 will become effective at the end of the California Coastal Commission appeal period and will expire at the end of 2 years .

CALIFORNIA COASTAL COMMISSION
NORTH COAST DISTRICT OFFICE
1385 8TH STREET, SUITE 130
ARCATA, CALIFORNIA 95521-5967
(707) 826-8950
WWW.COASTAL.CA.GOV

NOTIFICATION OF APPEAL PERIOD

April 08, 2026

To: Michael Holtermann
Humboldt County Planning and Building Department
3015 H Street
Eureka, CA 95501

From: Rebecca Jacobson, Coastal Planner

Re: **Application No. 1-HUM-25-1257**

Please be advised that on April 07, 2026, our office received notice of local action on the coastal development permit described below:

Local Permit: PLN-2025-19446

Applicant(s): Mckinleyville Community Services District, Attn: Pat Kaspari

Description: A Coastal Development Permit (CDP) and Special Permit (SP) for McKinleyville Community Services District to retrofit the three U.S. 101 sewer crossings that drain wastewater from the east side of U.S. 101 to the west side where the District's treatment facility is located. A Special Permit is required for major vegetation removal to facilitate the retrofit. The proposed replacement method for each highway crossing is Horizontal Auger Boring (HAB). A previous CDP (PLN-2025-19282) authorized geotechnical drilling to determine appropriate design parameters. The retrofitted sewer crossings would increase earthquake resiliency of the utility above current conditions.

Location: 1300 Anderson Ave, Mckinleyville, Humboldt County (APN(s): 508-031-004, 508-031-008, 508-073-002, 508-091-037, 510-221-002, 510-271-079, 510-451-043, 511-011-008, 511-011-024, 511-011-025, 511-021-060, 511-031-022, 511-031-060)

Unless an appeal is filed with the Coastal Commission, the action will become final at the end of the Commission appeal period. The appeal period will end at 5:00 PM on April 21, 2026.

Our office will notify you if an appeal is filed.

If you have any questions, please contact me at the address and telephone number shown above.

cc: Mckinleyville Community Services District, Attn: Pat Kaspari
GHD, Attn: Andrea Hilton