

SET NO: _____



Municipal Water District

San Diego County, California

**FINAL CONTRACT DOCUMENTS
FOR THE CONSTRUCTION OF:**

**THE GARDENDALE AND VILLAGE PARK WEST PRESSURE
REDUCING STATION (PRS) REPLACEMENTS
(OMWD PROJECT NUMBERS D120104 AND D120105)**

MAY 2024

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OLIVENHAIN MUNICIPAL WATER DISTRICT

San Diego County California

FINAL CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

**THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION
(PRS) REPLACEMENTS
(OMWD PROJECT NUMBERS D120104 AND D120105)**

MAY 2024

LARS

05/08/2024

Lindsey Stephenson, P.E.
Engineering Manager

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BID FORM CHECKLIST

(To be placed in the Bidder's Contract Documents in front of the Table of Contents)

Bid Form Page	Requirement	Initial
1 of 16	BID FORM- Fill out the form and acknowledge <u>all</u> addenda in the spaces provided at the end of the first paragraph	
2 of 16	BIDDING INSTRUCTIONS- Examination of the site and review of the Contract Documents has been completed	
2 of 16	BIDDING INSTRUCTIONS- Bid Schedule and all Bid forms are to be submitted with this Bid Form Checklist	
4-6 of 16	BID SCHEDULES- Fill out all items in the Bid Schedules, including dollar amounts in words and in numbers for each item	
6 of 16	DESIGNATION OF SUBCONTRACTORS- Fill in all information required on the form	
7 of 16	LISTING OF MANUFACTURERS- Fill in all information required on the form	
8 of 16	Fill in the type of Bid Bond enclosed in the first paragraph, and list all principals of the company in the third paragraph	
9 of 16	Fill in Bidder's license classification, license number, and all other information required in the fourth paragraph, including signature and date	
10 of 16	CERTIFICATE OF DRUG-FREE WORKPLACE- Fill in Bidder's name at the top and Certification section at the bottom of the page, including signature and date	
11 of 16	CERTIFICATE OF NONDISCRIMINATION- Fill in all information required on the form, including signature and date	
12 of 16	NONCOLLUSION AFFIDAVIT- Fill in all information required on the form including signature and date and provide notarization	
13-14 of 16	BIDDER'S EXPERIENCE- Fill in all information required on the form and provide signature and date at the bottom.	
15 of 16	INSURANCE ACKNOWLEDGEMENT- Fill in all information required on the form and provide signature and date where indicated	
1 of 2	BID BOND- Fill in all required information including dollar amount	
2 of 2	BID BOND- Fill in all required information, provide signatures of the bidder and surety where indicated, provide notarization for principal of bidder and surety, and attach a certified Power of Attorney for surety	
Bid Notice 2 of 4	MARKING AND ADDRESSING BID ENVELOPE- Contract Documents are sealed in an envelope marked and addressed as required in this section	

Dated _____ Signature of Bidder _____

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APPENDIX B: POTHOLING REPORT

APPENDIX C: CITY OF ENCINITAS TRENCH CUT MORATORIUM WAIVER FORM.

REFERENCE STANDARDS

Olivenhain Municipal Water District, Standard Specifications and Drawings for the Construction of Water, Recycled Water, and Sewer Facilities, February, 2017.

Standard Specifications for Public Works Construction, "Greenbook", 2012.

San Diego Regional Standard Drawings (Latest Edition).

PROJECT PLANS

The Gardendale and Village Park West PRS Replacements (bound separately).

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PART I

BIDDING AND CONTRACT REQUIREMENTS

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NOTICE INVITING SEALED BIDS
FOR THE CONSTRUCTION OF
THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS)
REPLACEMENTS
FOR THE
OLIVENHAIN MUNICIPAL WATER DISTRICT

NOTICE IS HEREBY GIVEN that the Board of Directors of said District invites and will receive sealed bids up to the hour of **2:00 p.m. on Tuesday, June 11, 2024** for the furnishing to said District of all transportation, labor, materials, tools, equipment, services, permits, utilities, and other items necessary to construct said work. At said time, said bids will be publicly opened and read aloud at the office of the Olivenhain Municipal Water District, 1966 Olivenhain Road, Encinitas, CA 92024, (760) 753-6466.

The District will conduct a **Non-Mandatory Pre-Bid Conference** at the Olivenhain Municipal Water District, 1966 Olivenhain Road, Encinitas, CA 92024, at **10:30 a.m. on Thursday, May 23, 2024**.

All questions relative to this project prior to the opening of bids shall be directed to the District. It shall be understood that no specification interpretations will be made by telephone nor will any "or equal" products be considered for approval prior to award of the contract. Bidders are encouraged to submit their pre-bid questions as early as possible, in writing via email, so they can be answered in writing through an addendum if necessary. Pre-bid questions will be received, in writing to prebid@olivenhain.com, up to **2:00 p.m. on Friday, May 31, 2024**, after which they will not be answered.

Bids shall conform to and be responsive to the Contract Documents for the work. Contract Documents can be downloaded from the "Upcoming Projects and Planning Resources" link under "Construction Projects" on the home page of the District's website at www.olivenhain.com. Contract documents are not available at the District. It will be the Bidder's responsibility to download and acknowledge receipt of all addenda. If you wish to be placed on the plan holders list, please send your company name, contact person, contact phone number and email to prebid@olivenhain.com.

Each bid shall be submitted on the bid form furnished as part of the Contract Documents and must state the Contractor's applicable license classification, license number, license expiration date, name of license holder, and relationship to Bidder. The license classification required for this project is Class A General Engineering. Each bid must be accompanied by cash, a cashier's check, a certified check, or a bidder's bond executed by an admitted surety insurer. This proposal guarantee shall be in an amount of not less than 10 percent of the amount of the bid and made payable to the order of or for the benefit of the District.

Said cash, check, or bond shall be given as guarantee that the Bidder will enter into a contract with the District and furnish the required payment and performance bonds and insurance certificates and endorsements if awarded the work, and will be declared forfeited if the Bidder refuses to timely enter into said contract or furnish the required bonds or insurance certificates and endorsements if his bid is accepted.

Each bid shall be sealed and delivered to District personnel at 1966 Olivenhain Road, Encinitas, CA 92024 on or before the day and hour set for the opening of bids. Bids shall be sealed in an envelope marked and addressed in accordance with Section 00810. Whether the bidder submits by mail or in-person, it is the sole responsibility of the bidder to see that his/her bid is received as specified by personnel of the Owner on or before the day and hour of bid opening. Bids not marked as being received by personnel of the Owner on or before the day and hour of bid opening will be rejected.

Each bid shall be sealed and delivered to District personnel at 1966 Olivenhain Road, Encinitas, CA 92024 on or before the day and hour set for the opening of bids. Bids shall be sealed in an envelope marked and addressed as follows:

BID FOR CONSTRUCTION OF:

**THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS)
REPLACEMENTS**

OLIVENHAIN MUNICIPAL WATER DISTRICT
Attention: Prebid, Engineering Department
1966 Olivenhain Road
Encinitas, California 92024

IN-PERSON bids must be sealed and received as specified above by the district front office before the day and hour set for the opening of the bids.

MAILED BIDS shall be in sealed envelopes, shall be sent at bidder's risk via certified mail (or equivalent trackable delivery) with postage prepaid, shall be marked and addressed as indicated above, and received before the day and hour set for the opening of the bids. Any bidder electing to submit a bid by mail must notify the district prior to the bid opening at prebid@olivenhain.com of a mailed bid and provide the tracking number so the District can validate receipt.

ELECTRONICALLY transmitted bids are not considered sealed bids and will not be accepted.

Whether the bidder submits by mail or in-person, it is the sole responsibility of the bidder to see that his/her bid is received as specified by personnel of the Owner on or before the day and hour of bid opening. Bids not marked as being received by personnel of the Owner on or before the day and hour of bid opening will be rejected.

Bidders shall have successfully completed a minimum of five (5) similar projects during the last eight (8) years performing the type and value of work required by this contract on public potable water distribution systems, of which at least two (2) must include Pressure Reducing Stations.

Where the Bidder is a corporation or partnership, the entity must demonstrate at least five (5) years of successful experience with the work required by the contract. Bidders failing to demonstrate this experience may be rejected as nonresponsive at the option of the District.

Under the provisions of the California Public Works Apprenticeship Standards, Sections 1777.5, 1777.6, and 1777.7 of the Labor Code, a copy of the "Extract of Public Works Contract Award" has been included. This document will be filed with the California Department of Industrial Relations at the time of the award of the Contract.

The Board of Directors has obtained from the Director of the California Department of Industrial Relations a determination of the general prevailing rate of per diem, wages, and the general prevailing rate for legal holiday and overtime work in the locality in which said work is to be performed for each craft, classification, or type of worker needed. Not less than the determined rates shall be paid to all workers employed in the performance of the contract. Such rates of wages are on the file with the Department of Industrial Relations and in the office of the District and are available to any interested party upon request.

Pursuant to Public Contract Code Section 22300, the Contractor may substitute equivalent securities for retention amounts which this Contract requires. However, the District reserves the right to solely determine the adequacy of the securities being proposed by the Contractor and the value of those securities. The District shall also be entitled to charge an administrative fee, as determined by the District in its sole discretion, for substituting equivalent securities for retention amounts.

The Contractor agrees that the District's decision with respect to the administration of the provisions of Public Contract Code Section 22300 shall be final and binding and not subject to subsequent litigation or arbitration of any kind as to acceptance of any securities being proposed, the value of these securities, the costs of administration and the determination of whether or not the administration should be accomplished by an independent agency or by the District. The District shall be entitled, at any time, to request the deposit of additional securities of a value designated by the District, in the District's sole discretion, to satisfy this requirement. If the District does not receive satisfactory securities within 12 calendar days of the date of the written request, the District shall be entitled to withhold amounts due Contractor until securities of satisfactory value to the District have been received.

Pursuant to Section 995.710 of the Code of Civil Procedures, the Contractor may substitute any of the instruments specified in Code of Civil Procedure Section 995.710 for the performance and payment bonds required by the Contract Documents. All such substitutions shall be subject to review and approval by the District. Contractor agrees to pay all attorney's fees and all other fees, costs, and expenses incurred by the District in reviewing substitutes proposed by the Contractor and in preparing and implementing any agreements determined appropriate by the District to adequately protect District.

All bidders shall agree to obtain and maintain in full effect all required insurance with limits not less than the amounts indicated. Bidders who fail to comply with the insurance requirements of this contract may have their bids rejected as nonresponsive at the election of the District.


Pursuant to California Labor Code Section 6705, the cost of sheeting, shoring, and bracing of trenches, or equivalent method, where part of the job, shall constitute a separate bid item under these contract documents.

District shall award the contract for the Project to the lowest responsive, responsible Bidder as determined by the District based on the **total Bid price for Schedule A and Schedule B**. District reserves the right to award any or all Bid Schedules, reject any and all bids, to waive any irregularity in the bids received and to award the Contract on the basis of the responsive bids.

The Board of Directors of the District reserves the right to select the schedule(s) under which the bids are to be compared and contract(s) awarded, to reject any and all bids, and to waive any and all irregularities or defects in any bid.

OLIVENHAIN MUNICIPAL WATER DISTRICT

Dated: 05/08/2024



LINDSEY STEPHENSON, P.E.
ENGINEERING MANAGER

BID FORM

**BID TO
OLIVENHAIN MUNICIPAL WATER DISTRICT
SAN DIEGO COUNTY, CALIFORNIA**

**FOR THE CONSTRUCTION OF
THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS)
REPLACEMENTS**

Name of Bidder: _____

Business Address: _____

_____ Phone No.: _____

TO THE GOVERNING BODY OF THE OLIVENHAIN MUNICIPAL WATER DISTRICT

Pursuant to and in compliance with your Notice Inviting Sealed Bids and the other documents relating thereto, the undersigned Bidder, being fully familiar with the terms of the Contract Documents, local conditions affecting the performance of the Contract, the character, quality, quantities, and scope of the work, and the cost of the work at the place where the work is to be done, hereby proposes and agrees to perform within the time stipulated in the Special Provisions Section 00810 of the Contract, including all of its component parts and everything required to be performed, and to furnish any and all of the labor, material, tools, equipment, transportation, services, permits, utilities, and all other items necessary to perform the Contract and complete in a workmanlike manner, all of the work required in connection with the construction of said work all in strict conformity with the Plans and Specifications and other Contract Documents, including Addenda for the prices hereinafter set forth.

The undersigned acknowledges receipt, understanding and full consideration of the following addenda to the Contract Documents:

Addendum No. _____	Date Issued _____
Addendum No. _____	Date Issued _____
Addendum No. _____	Date Issued _____

The undersigned as Bidder, declares that the only persons or parties interested in this bid as principals are those named herein; that this bid is made without collusion with any person, firm, or corporation; and he proposes and agrees, if the bid is accepted, that he will execute a Contract with the Owner in the form set forth in the Contract Documents and that he will accept in full payment thereof the following prices, to wit:

BIDDING INSTRUCTIONS
FOR THE CONSTRUCTION OF
THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS)
REPLACEMENTS

Prior to the opening of bids, all questions relative to this project **shall be directed to Olivenhain Municipal Water District, Attn: Pre-bid. Bidders** are encouraged to submit their pre bid questions as early as possible, in writing to prebid@olivenhain.com, so they can be answered in writing through addendum, if necessary. **Pre bid questions will be received up to 2:00 p.m., on Friday, May 31, 2024 after which no questions will be taken or answered.**

Bidders shall submit information demonstrating relevant project experience on the Bid Forms included within these Contract Documents. Bidders failing to demonstrate this experience may be rejected as nonresponsive at the option of the Owner.

Bidders agree to obtain and maintain in full effect all required insurance with limits not less than the amounts indicated. Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company. Bidders who fail to comply with the insurance requirements of this Contract may have their bids rejected as nonresponsive at the election of the Owner.

The Bidder's attention is directed to General Provisions Article 3-1 "Award of Contract or Rejection of Bids" in the General Provisions concerning the above conditions.

Bidders must satisfy themselves of the character of the work to be performed by examination of the site and review of the Contract Documents. After bids have been submitted, the Bidder expressly waives the right to assert that there was a misunderstanding concerning the nature of the work to be done. Any bid protests must be submitted within three (3) calendar days of the bid due date.

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

Bids shall be made on the Bid Form and Bid Bond included within these Contract Documents. Bidders shall designate the subcontractors and list the manufacturers of materials to be used in the Project on the Designation of Subcontractors form included with these Contract Documents. All subcontractors listed to perform any of the work must be licensed in the State of California. No single subcontractor may perform more than 25% of the work listed in the Bid Schedule unless specifically approved in advance by the District prior to the submission of bids. The Owner reserves the right to find a bid non-responsive in the sole discretion Owner if a Bidder lists any unlicensed subcontractors to perform any of the work. Submit with the bid the completed Bid Forms included within these Contract Documents. Completely fill out the one page Bid Form Checklist included in front of the Table of Contents and include it with the bid.

The Owner reserves the right to find a bid non-responsive in its sole discretion of a Bidder fails to complete or include any of the aforementioned certificates or acknowledgements.

The pay items listed in the Bid Schedules are described in Specification Section 01150 – Measurement and Payment.

There are multiple Bid Schedules. In order for the Owner to consider a Bidder's bid and for a bid to be considered responsive, all bid schedules must be completed. If any bid schedule is not filled in, the bid will be determined to be non-responsive and will be rejected. The Owner reserves the right to reject any and all bids, to waive any irregularity in the bids received, and to award the Contract on the basis of the responsive bids.

Basis for the award shall be based on the **total Bid price for Schedules A and Schedule B**. The District reserves the right to award any or all Bid Schedules, reject any and all bids, to waive any irregularity in the bids received and to award the Contract on the basis of the responsive bids.

BID SCHEDULE A – VILLAGE PARK WEST PRS

THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS

Item	Description	Quantity	Unit	Unit Cost	Total Amount
A.1	Mobilization, Demobilization, Bonds, Permits, Insurance ¹	1	LS		\$ _____
A.2	Dewatering	1	LS		\$ _____
A.3	Village Park West PRS Installation	1	LS		\$ _____
A.4	Piping, connections, and abandonments	1	LS		\$ _____
A.5	Site and Surface restoration	1	LS		\$ _____
A.6	Potholing	1	LS		\$ _____
A.7	Traffic Control	1	LS		\$ _____

TOTAL AMOUNT OF BID SCHEDULE A ITEMS 1 THROUGH 7:

\$ _____

TOTAL AMOUNT OF BID SCHEDULE A ITEMS (IN WORDS):

Amounts shall be shown in both words and figures, where indicated. In case of discrepancy, the amount shown in words will govern.

The above prices shall include all labor, materials, removal, overhead, profit, insurance, and incidentals required to complete the work.

¹Mobilization is limited to 5% of the total bid price for Bid Schedule A

Note: By submission of this Bid, the Contractor acknowledges the two year guarantee as outlined in Section 5-14 of the General Provisions and has included said expenses as a part of this Bid.

BID SCHEDULE B – GARDENDALE PRS

THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS

Item	Description	Quantity	Unit	Unit Cost	Total Amount
B.1	Mobilization, Demobilization, Bonds, Permits, Insurance ¹	1	LS		\$ _____
B.2	Dewatering	1	LS		\$ _____
B.3	Gardendale PRS Installation	1	LS		\$ _____
B.4	Piping, connections, and abandonments	1	LS		\$ _____
B.5	Site and Surface Restoration	1	LS		\$ _____
B.6	Potholing	1	LS		\$ _____
B.7	Traffic Control	1	LS		\$ _____

TOTAL AMOUNT OF BID SCHEDULE B ITEMS 1 THROUGH 7:

\$ _____

TOTAL AMOUNT OF BID SCHEDULE B ITEMS (IN WORDS):

Amounts shall be shown in both words and figures, where indicated. In case of discrepancy, the amount shown in words will govern.

The above prices shall include all labor, materials, removal, overhead, profit, insurance, and incidentals required to complete the work.

¹Mobilization is limited to 5% of the total bid price for Bid Schedule B

Note: By submission of this Bid, the Contractor acknowledges the two year guarantee as outlined in Section 5-14 of the General Provisions and has included said expenses as a part of this Bid.

BASE BID SCHEDULE A & B
THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS)
REPLACEMENTS

**TOTAL AMOUNT OF BASE BID SCHEDULE A &
BASE BID SCHEDULE B**

\$ _____

TOTAL AMOUNT OF BASE BID SCHEDULE A & BASE BID SCHEDULE B (IN WORDS)

Amounts shall be shown in both words and figures, where indicated. In case of discrepancy, the amount shown in words will govern.

Note: By submission of this Bid, the Contractor acknowledges the two year guarantee as outlined in Section 5-14 of the General Provisions and has included said expenses as a part of this Bid.

DESIGNATION OF SUBCONTRACTORS

In compliance with the provisions of Section 4100 4114 of the Public Contract Code of the State of California, and any amendments thereof, each Bidder shall set forth below, the name, license number, and location of the mill, shop or office of each subcontractor who will perform work or labor, or render service to the Contractor in an amount in excess of one half (1/2) of one percent (1%) of the total bid, and the portion of the work which will be done by each subcontractor. All subcontractors listed must be licensed to perform the subcontract work in the State of California. No single subcontractor may perform work in excess of 25% of the total work listed in the Bid Schedule unless specifically approved by the District in advance of submission of the Bid. Bidders who list any unlicensed subcontractors on this form may have their bid rejected as non-responsive in the sole discretion of Owner.

If the Bidder fails to specify a subcontractor for any portion of the work in excess of one half (1/2) of one percent (1%) of the total bid to be performed under the Contract, he shall be deemed to have agreed to perform such portion himself, and he shall not be permitted to subcontract that portion of the work except under conditions permitted by law.

Subletting or subcontracting any portion of the work as to which no subcontractor was designated in the original bid shall only be permitted in case of public emergency or necessity, or otherwise permitted by law, and then only after a finding reduced to writing as a public record of the Owner.

Trade	% of Work To Be Done	Name of Subcontractor	License Number & DIR Number	Address
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

ACCOMPANYING THIS BID IS

(insert the words "cash", "a cashier's check", "a certified check", or "a Bidder's bond" as the case may be) in an amount equal to at least 10 percent of the total amount of the Bid, payable to the

OLIVENHAIN MUNICIPAL WATER DISTRICT

The undersigned deposits the above named security as a bid guarantee and agrees that it shall be forfeited to the Owner as liquidated damages in case this bid is accepted by the Owner and the undersigned fails to execute a contract with the Owner as specified in the Contract Documents or fails to furnish the required payment and performance bonds, and insurance certificates and endorsements. Should the Owner be required to engage the services of an attorney in connection with the enforcement of this bid, Bidder promises to pay Owner's reasonable attorneys' fees, incurred with or without suit.

The names of all persons interested in the foregoing bids as principals are as follows: (NOTICE If Bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager thereof; if a general partnership, state true name of firm, also names of all individual partners composing firm; if a limited partnership, the names of all general partners and limited partners; if Bidder or other interested person is an individual, state first and last names in full; if the Bidder is a joint venture, state the complete name of each venturer).

The Owner has determined the license classification necessary to bid and perform the subject contract. In no case shall this Contract be awarded to a specialty contractor whose classification constitutes less than a majority of the project. When a specialty contractor is authorized to bid a portion of the work of this contract, all work to be performed outside of the contractor's license specialty, except work specifically authorized by the Owner, shall be performed by a licensed subcontractor in compliance with the Subletting and Subcontracting Fair Practices Act commencing with Section 4100 et seq., of the Public Contract Code. See Business and Professions Code Section 7059.

The Contractor's license classification(s) required for this project are as follows:

CLASS A – GENERAL ENGINEERING

It is the Owner's intent that "plans," as used in Public Contract Code Section 3300, is defined as the construction Contract Documents, which include both the Plans and the Specifications.

Bidder warrants and represents that it has the required experience performing the type of work required by this Contract.

Bidder warrants and represents, under penalty of perjury, that license(s) required by California State Contractor's License Law for the performance of the subject project are in full effect and proper order. Bidders must state, under penalty of perjury, the Contractor's applicable license classification, license number, license expiration date, name of license holder, and relationship to Bidder. Any bid not containing this information may be considered nonresponsive and may be rejected by the Owner.

Bidders relying upon licenses of Responsible Managing Employees (RME) or Responsible Managing Officers (RMO) agree to provide the Owner with all information it determines necessary to verify that the Bidder complies with California State Contractor's License Law.

DIR Registration Number: _____

License Classification: _____

License Number: _____

Expiration Date: _____

Name of License Holder: _____

Relationship to Bidder: _____

Name of Bidder: _____

Signatures: _____

Dated: _____, 20 _____

NOTE: 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 and the corporate seal; if Bidder is a partnership, the true name of the firm shall be set forth above, together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; if the Bidder is an individual, his signature shall be placed above; if the Bidder is a joint venture, the name of the joint venture shall be set forth above with the signature of an authorized representative of each venturer.

CERTIFICATE OF DRUG-FREE WORKPLACE

BIDDER: _____

The Bidder named above hereby certifies compliance with Government Code Section 8355 in matters relating to providing a drug-free workplace. The above named Bidder will:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations, as required by Government Code Section 8355(a).
2. Establish a Drug-Free Awareness Program as required by Government Code Section 8355(b), to inform employees about all of the following:
 - (a) The dangers of drug abuse in the workplace,
 - (b) The person's or organization's policy of maintaining a drug-free workplace,
 - (c) Any available counseling, rehabilitation and employee assistance programs, and
 - (d) Penalties that may be imposed upon employees for drug abuse violations.
3. Provide as required by Government Code Section 8355(c), that every employee who works on the proposed contract or loan:
 - (a) Will receive a copy of the company's drug-free policy statement, and
 - (b) Will agree to abide by the terms of the company's statement as a condition of employment on the contract or loan.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized legally to bind the Bidder to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME: _____

DATE EXECUTED: _____ EXECUTED IN COUNTY OF: _____

OFFICIAL'S SIGNATURE: _____

TITLE: _____

CERTIFICATE OF NONDISCRIMINATION

1. During the performance of this contract, Bidder and its subcontractors shall not unlawfully discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status, age (over 40) or sex. Bidders and subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free of such discrimination. Bidder and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.) and the applicable regulations promulgated thereunder (California Administrative Code, Title 2, Section 7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12900, set forth in Chapter 5 of Division 4 of Title 2 or the California Administrative Code are incorporated into this contract by reference and made a part hereof as if set forth in full. Bidder and its subcontractor shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.
2. This Bidder shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

THE UNDERSIGNED CERTIFIES THAT THE BIDDER WILL COMPLY WITH THE ABOVE REQUIREMENTS.

BIDDER NAME: _____

CERTIFIED BY:

NAME: _____ TITLE: _____

SIGNATURE: _____ DATE: _____

NONCOLLUSION AFFIDAVIT

State of _____)
) ss.
County of _____)

I, _____, being duly sworn, deposes
and says that he or she is _____ of

_____, the party making the foregoing
bid, that the bid is not made in the interest of, or on behalf of, any undisclosed person,
partnership, company, association, organization, or corporation; that the bid is genuine and not
collusive or sham; that the bidder has not directly or indirectly colluded, conspired, connived, or
agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from
bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement,
communication, or conference, with anyone to fix the bid price of the bidder or any other bidder,
or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to
secure any advantage against the public body awarding the contract of anyone interested in the
proposed contract; that all statements contained in the bid are true; and, further, that the bidder
has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the
contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any
fee to any corporation, partnership, company association, organization, bid depository, or to any
member or agent thereof the effectuate a collusive or sham bid.

Signature of Bidder: _____

Subscribed and sworn to before me on this _____ day of _____
_____, 20__.

BIDDER'S EXPERIENCE

Name of Bidder: _____

License Number: _____

DIR Registration Number: _____

Bidders shall have successfully completed a minimum of five (5) similar projects during the last eight (8) years performing the type and value of work required by this contract on public potable water distribution systems, of which at least two (2) must include Pressure Reducing Stations.

Complete the table on the following page. Additional sheets may be provided, as needed. Projects not similar in scope, fee, and complexity will not be considered as representative of this project.

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Project Name and Location					
Prime or Subcontractor to the Project					
Project Owner. Provide Contact Name & Phone Number					

(Continued on next page)

Cost of Bidder's Work					
Description of Relevant Work					
Date Completed					

I declare, under penalty of perjury, that the foregoing is true and correct.

Dated: _____, 20__

_____ (Signature of Bidder)

INSURANCE ACKNOWLEDGMENT

On behalf of the Bidder making this bid, the undersigned warrants and represents that the Bidder has carefully read and understood all of the insurance requirements of the Contract Documents and has included the full cost of providing insurance meeting all requirements of the Contract Documents in the bid. **The minimum insurance coverage shall be set forth in the Special Provisions Section 00810.**

Upon request by Owner prior to the time of Award, the Bidder agrees to promptly provide Owner with letters from insurance companies meeting the requirements of the Contract Documents verifying that they are prepared to issue insurance to Bidder meeting all requirements of the Contract Documents. The failure of Bidder to provide Owner with this proof of insurance prior to the time of Award shall entitle Owner to reject the Bidder's bid as nonresponsive and to Award the bid to the next lowest Bidder at the sole discretion of Owner.

The failure of Bidder to provide Owner with insurance meeting all requirements of the Contract Documents within 15 calendar days after the Award, shall constitute a material breach of the Contract, entitling Owner to terminate the Contract and call the bid bond.

By dating and executing this Insurance Acknowledgment, Bidder hereby accepts all terms and conditions of this Insurance Acknowledgment and agrees to be bound by all of its terms.

Dated: _____, 20____

(Name of Bidder)

(Signature)

(Typed Name and Title)

(BLANK)

BID BOND

We, _____ as Principal, and
_____ as Surety, jointly and severally, bind
ourselves, our heirs, representatives, successors and assigns, as set forth herein, to the

OLIVENHAIN MUNICIPAL WATER DISTRICT

(herein called Owner) for payment of the penal sum of _____ Dollars
(\$ _____), lawful money of the United States. Principal has submitted the accompanying
bid for the construction of

**THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS)
REPLACEMENTS**

If the Principal is awarded the Contract and enters into a written contract, in the form
prescribed by the Owner, at the price designated by his bid, and files two bonds with the
Owner, one to guarantee payment for labor and materials and the other to guarantee faithful
performance, in the time and manner specified by the Owner, and carries all insurance in type
and amount which conforms to the Contract Documents and furnishes required certificates and
endorsements thereof, then this obligation shall be null and void; otherwise it shall remain in
full force and effect.

Forfeiture of this bond, or any deposit made in lieu thereof, shall not preclude the Owner from
seeking all other remedies provided by law to cover losses sustained as a result of the Principal's
failure to do any of the foregoing.

Principal and Surety agree that if the Owner is required to engage the services of an attorney in connection with the enforcement of this bond, each shall pay Owner's reasonable attorney's fees incurred with or without suit.

Executed on _____, 20__

PRINCIPAL

By: _____

(Seal if Corporation)

Title: _____

(Attach Acknowledgment of Authorized Representative of Principal)

Any claims under this bond may be addressed to:

_____ (name and address of Surety)

_____ (name and address of Surety's agent for service of process in California, if different from above)

_____ (telephone number of Surety's agent in California)

(Attach Acknowledgment)

SURETY

By: _____

(Attorney-in-Fact)

NOTICE:

No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California. A certified copy of the Power of Attorney must be attached.

AGREEMENT

THIS AGREEMENT, made and entered into by and between the

OLIVENHAIN MUNICIPAL WATER DISTRICT

hereinafter referred to as "OWNER" and

_____ ;

a corporation under the laws of the state of _____

;

a partnership composed of _____

_____ ;

a joint venture composed of _____

_____ ;

an individual doing business as _____ ;

hereinafter referred to as "CONTRACTOR."

OWNER and CONTRACTOR agree as follows:

- (1) **SCOPE OF WORK:** CONTRACTOR will furnish all materials and will perform all of the work for the construction of the

THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS

in accordance with the plans and specifications and other contract documents therefor.

- (2) **TIME OF COMPLETION:** The work shall be completed within the times set forth in the Special Provisions Section 00810. Time is of the essence.
- (3) **CONTRACT SUM:** OWNER will pay CONTRACTOR in accordance with the prices shown in the Bid Form.
- (4) **PAYMENTS:** Monthly progress payments and the final payment will be made in accordance with the General Provisions as modified by the Special Provisions. The filing of the notice of completion by OWNER shall be preceded by acceptance of the work made only by an action of the Governing Body of OWNER in session.
- (5) **COMPLIANCE WITH PUBLIC CONTRACTS LAW:** OWNER is a public agency in the State of California and is subject to the provisions of law relating to public contracts. It is

agreed that all provisions of law applicable to public contracts are a part of this Contract to the same extent as though set forth herein and will be complied with by CONTRACTOR.

(6) CONTRACT DOCUMENTS: The complete contract includes all the contract documents set forth herein, to wit: Notice Inviting Sealed Bids, Bid Form, Bid Bond, Agreement, Performance Bond, Payment Bond, Contractor's Certificate Regarding Workers' Compensation, Certificate of Insurance (Workers' Compensation and Employer's Liability), Insurance Endorsement (Workers' Compensation and Employer's Liability), Certificate of Insurance (Liability), Insurance Endorsement (Liability), Certificate of Insurance (Builders' Risk "All Risk"), Insurance Endorsement (Builders' Risk "All Risk"), General Provisions, Special Provisions, Standard Specifications, Standard Drawings, Referenced Permits, Drawings, Plans, and also Addenda thereto and supplemental agreements.

This Agreement is executed by the OWNER pursuant to an action of its Governing Body in session on _____, 20____, authorizing the same, and CONTRACTOR has caused this Agreement to be duly executed.

Dated: _____, 20____ By: _____
(Authorized Representative of Owner)

Title: _____ GENERAL MANAGER _____

Dated: _____, 20____ _____
(Contractor)

By: _____
(Authorized Representative of Contractor)

Title: _____

(Seal if Corporation)

(Attach Acknowledgment for Authorized Representative of Contractor)

APPROVED:

(Attorney for OWNER)

Date

CERTIFICATE OF CONTRACTOR

I, _____, certify that I am a/the

[designate sole proprietor, partner in partnership, or specify corporate office, e.g., secretary] in the entity named as CONTRACTOR in the foregoing contract.

I hereby expressly certify that the name of the entity to which I am associated is _____

_____;

that this entity is in good standing and has complied with all applicable laws and regulations, and that I have been expressly authorized by the proper parties in this entity to execute this contract on behalf of the above-named entity.

(Signature)

ATTEST:

Name: _____

(Please Print)

Title: _____

(BLANK)

PERFORMANCE BOND

We, _____ as Principal,
and _____ as Surety, jointly and
severally, bind ourselves, our heirs, representatives, successors and assigns, as set forth herein,
to the

OLIVENHAIN MUNICIPAL WATER DISTRICT

(herein called Owner) for payment of the penal sum of _____

Dollars (\$ _____),

lawful money of the United States. Owner has awarded Principal a contract for the construction
of

**THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS)
REPLACEMENTS**

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Principal shall in all things abide
by and well and truly keep and perform the covenants, and agreements in the said contract, and
any alteration thereof made as therein provided, on his part to be kept and performed at the time
and in the manner therein specified, including all guarantees of workmanship and/or materials
for a two (2) year period, and shall indemnify and save harmless the Owner, District, the
Engineer/Architect, the Owner's Representative, and their consultants, and each of their
directors, officers, employees, and agents, as therein stipulated, this obligation shall become
null and void, otherwise, it shall be and remain in full force and effect.

Surety agrees that no change, extension of time, alteration, or addition to the terms of the
contract, or the work to be performed thereunder, or the plans and specifications shall in any
wise affect its obligation on this bond, and it does hereby waive notice thereof.

Principal and Surety agree that if the Owner is required to engage the services of an attorney in
connection with the enforcement of this bond, each shall pay Owner's reasonable attorney's fees
incurred, with or without suit, in addition to the above sum.

Executed in three original counterparts on

_____, 20__

PRINCIPAL

By: _____

(Seal if Corporation)

Title: _____

(Attach Acknowledgment of Authorized Representative of Principal)

Any claims under this bond may be addressed to:

_____ (name and address of Surety)

_____ (name and address of Surety's agent for service of process in California, if different from above)

_____ (telephone number of Surety's agent in California)

(Attach Acknowledgment)

_____ SURETY

By: _____
(Attorney-in-Fact)

APPROVED:

(Attorney for OWNER)

Date

NOTICE:

No substitution or revision to this bond form will be accepted. Sureties must meet all requirements of Code of Civil Procedure Section 995.660(a). A certified copy of the Power of Attorney must be attached.

PAYMENT BOND

We, _____ as Principal,
and _____ as Surety, jointly and
severally, bind ourselves, our heirs, representatives, successors and assigns, as set forth herein, to the

OLIVENHAIN MUNICIPAL WATER DISTRICT

(herein called Owner) for payment of the penal sum of _____

_____ Dollars (\$ _____),

lawful money of the United States. Owner has awarded Principal a contract for the construction of

**THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS)
REPLACEMENTS**

If Principal or any of his subcontractors fails to pay any of the persons named in Section 3181 of the California Civil Code, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract or during the two-year guarantee period, or for any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board from the wages of employees of the contractor and his subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor, then Surety will pay the same in an amount not exceeding the sum specified above, and also will pay, in case suit is brought upon this bond, such reasonable attorney's fees as shall be fixed by the court.

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

Surety agrees that no change, extension of time, alteration, or addition to the terms of the contract, or the work to be performed thereunder, or the plans and specifications shall in any wise affect its obligation on this bond, and it does hereby waive notice thereof.

Principal and Surety agree that should Owner become a party to any action on this bond that, each will also pay Owner's reasonable attorney's fees incurred therein in addition to the sum above set forth.

Executed in three original counterparts on

_____, 20____

PRINCIPAL

By: _____

(Seal if Corporation)

Title: _____

(Attach Acknowledgment of Authorized Representative of Principal)

Any claims under this bond may be addressed to:

_____ (name and address of Surety)

_____ (name and address of Surety's agent for service of process in California, if different from above)

_____ (telephone number of Surety's agent in California)

(Attach Acknowledgment)

SURETY

By: _____
(Attorney-in-Fact)

APPROVED:

(Attorney for OWNER)

Date

NOTICE:

No substitution or revision to this bond form will be accepted. Sureties must meet all requirements of Code of Civil Procedure Section 995.660(a). A certified copy of the Power of Attorney must be attached.

CONTRACTOR'S CERTIFICATE

REGARDING WORKERS' COMPENSATION

Name of Contract: **THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS**

Name of Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT**

Labor Code Section 3700:

"Every employer except the State shall secure the payment of compensation in one or more of the following ways:

- (a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this State.
- (b) By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his employees.
- (c) For all political subdivisions of the state, including each member of a pooling arrangement under a joint exercise of powers agreement (but not the state itself), by securing from the Director of Industrial Relations a certificate of consent to self-insure against workers' compensation claims, which certificate may be given upon furnishing proof satisfactory to the director of ability to administer workers' compensation claims that may become due to its employees. On or before March 31, 1979, a political subdivision of the state which, on December 31, 1978, was uninsured for its liability to pay compensation, shall file a properly completed and executed application for a certificate of consent to self-insure against workers' compensation claims. The certificate shall be issued and be subject to the provisions of Section 3702."

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.

Dated: _____, 20____
_____ (Contractor)

By: _____
_____ (Authorized Representative of Contractor)

Title: _____

(Seal if Corporation)

(Labor Code Section 1861 provides that the above certificate must be signed and filed by the Contractor with the Owner prior to performing any work under this Contract.)

CERTIFICATE OF INSURANCE

Name of Contract: **THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS**

Name of Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT**

Type of Insurance: **WORKERS' COMPENSATION INSURANCE AND EMPLOYER'S LIABILITY INSURANCE**

THIS IS TO CERTIFY that the following policy has been issued by the below-stated company in conformance with the requirements of Articles 8-1 and 8-2 of the General Provisions and is in force at this time.

The Company will give at least 30 days' written notice by certified mail to the Owner and Engineer/Architect prior to any material change or cancellation of said policy.

<u>POLICY NUMBER</u>	<u>EXPIRATION DATE</u>	<u>TYPE OF INSURANCE</u>	<u>LIMITS OF LIABILITY</u>	
_____		A. WORKERS' COMPENSATION	Statutory Limits Under the Laws of the State of California	
_____		B. EMPLOYER'S LIABILITY	Each Employee	Each Accident
		Bodily Injury By Accident	\$	\$
		Bodily Injury By Disease	\$	\$

Named Insured (Contractor)

Insurance Company

Street Number

Street Number

City and State

City and State

By: _____
(Company Representative)
(SEE NOTICE ON PAGE 3 OF 3)

State of _____)
County of _____) ss.

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

On _____ before me, _____
Date Here Insert Name and Title of the Officer

Personally appeared _____
Name(s) of Signer(s)

Who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the withing instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal

NOTARY PUBLIC

Insurance Company Agent for Service of Process in California:

Name

Agency

Street Number

Street Number

City and State

City and State

Telephone Number

Telephone Number

This certificate or verification of insurance is not an insurance policy and does not amend, extend, or alter the coverage afforded by the policies listed herein. Notwithstanding any requirement, term, or condition of any contract or other document with respect to which this certificate or verification of insurance may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions, and conditions of such policies.

NOTICE:

No substitution or revision to the above certificate form will be accepted. If the insurance called for is provided by more than one insurance company, a separate certificate in the exact above form shall be provided for each insurance company.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.

(BLANK)

INSURANCE ENDORSEMENT

Name of Contract: **THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS**

Name of Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT**

Type of Insurance: **WORKERS' COMPENSATION INSURANCE AND EMPLOYER'S LIABILITY INSURANCE**

This endorsement forms a part of Policy No. _____.

ENDORSEMENT:

It is agreed that with respect to such insurance as is afforded by the policy, the Company waives any right of subrogation it may acquire against the Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents by reason of any payment made on account of injury, including death resulting therefrom, sustained by any employee of the insured, arising out of the performance of the above-referenced contract.

This endorsement does not increase the Company's total limits of liability.

Named Insured (Contractor)

Insurance Company

Street Number

Street Number

City and State

City and State

By: _____
(Company Representative)

(SEE NOTICE ON PAGE 2 OF 2)

State of _____)
County of _____) ss.

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

On _____ before me, _____
Date Here Insert Name and Title of the Officer

Personally appeared _____
Name(s) of Signer(s)

Who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the withing instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal

NOTARY PUBLIC

NOTICE:

No substitution or revision to the above endorsement form will be accepted. If the insurance called for is provided by more than one policy, a separate endorsement in the exact above form shall be provided for each policy.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.

CERTIFICATE OF INSURANCE

Name of Contract: **THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS**

Name of Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT**

Type of Insurance: **LIABILITY INSURANCE**

THIS IS TO CERTIFY that the following policies have been issued by the below-stated company in conformance with the requirements of Articles 8-1 and 8-3 of the General Provisions and are in force at this time. The policy shall be an occurrence policy with a deductible not to exceed \$5,000.

<u>POLICY NUMBER</u> <u>EXPIRATION DATE</u>	<u>TYPE OF INSURANCE</u>	<u>LIMITS OF LIABILITY</u>	
		In Thousands (000)	
		Occurrence	Aggregate
	A. GENERAL LIABILITY		
	Bodily Injury, Personal Injury, and Property Damage Combined	\$	\$
	B. EXCESS GENERAL LIABILITY	\$	\$
	C. AUTOMOBILE LIABILITY		
	Bodily Injury and Property Damage Combined	\$	\$
	D. EXCESS AUTOMOBILE LIABILITY	\$	\$

The following types of coverage are included in said policies (indicate by "X" in space):

A. GENERAL LIABILITY

- Comprehensive Form -----YES__ NO__
- Premises-Operations-----YES__ NO__
- Explosion and Collapse Hazard ----- YES__ NO__
- Underground Hazard-----YES__ NO__
- Products/Completed Operations Hazard-----YES__ NO__
- Contractual Insurance -----YES__ NO__
- Broad Form Property Damage Including Completed Operations -----YES__ NO__
- Independent Contractors-----YES__ NO__
- Personal Injury-----YES__ NO__

B. EXCESS GENERAL LIABILITY

- Umbrella Form -----YES__ NO__
- Other Than Umbrella Form-----YES__ NO__

If other than Umbrella Form, please explain below:

C. AUTOMOBILE LIABILITY

- Comprehensive Form Including Loading and Unloading -----YES__ NO__
- Owned -----YES__ NO__
- Hired-----YES__ NO__
- Non-Owned-----YES__ NO__

D. EXCESS AUTOMOBILE LIABILITY

- Umbrella Form -----YES__ NO__
- Other Than Umbrella Form-----YES__ NO__

If other than Umbrella Form, please explain below:

This certificate or verification of insurance is not an insurance policy and does not amend, extend, or alter the coverage afforded by the policies listed herein. However, the insurance provided shall meet the requirements of the Contract Documents and include coverage as specified in this certificate.

The Company will give at least 30 days' written notice by certified mail to the Owner and the Engineer/Architect prior to any material change or cancellation of said policies.

Named Insured (Contractor)

Insurance Company

Street Number

Street Number

City and State

City and State

By: _____
(Company Representative)

(SEE NOTICE ON PAGE 5 OF 5)

State of _____)
County of _____) ss.

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

On _____ before me, _____
Date Here Insert Name and Title of the Officer

Personally appeared _____
Name(s) of Signer(s)

Who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the withing instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal

NOTARY PUBLIC

Insurance Company Agent for Service
of Process in California:

Name

Agency

Street Number

Street Number

City and State

City and State

Telephone Number

Telephone Number

NOTICE:

No substitution or revision to the above certificate form will be accepted. If the insurance called for is provided by more than one insurance company, a separate certificate in the exact above form shall be provided for each insurance company.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.

(BLANK)

INSURANCE ENDORSEMENT

Name of Contract: **THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS**

Name of Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT**

Type of Insurance: **LIABILITY INSURANCE**

This endorsement forms a part of Policy No. _____.

ENDORSEMENT:

The Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents are included as additional insureds under said policies but only while acting in their capacity as such and only as respects operations of the named insured, his contractors, any subcontractor, any supplier, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable in the performance of the above-referenced contract. This insurance shall not apply if the loss or damage is ultimately determined to be the result of the sole and exclusive negligence (including any connected with the preparation or approval of maps, drawings, opinions, reports, surveys, designs, or specifications) of one or more of the aforesaid additional insureds. The insurance afforded to these additional insureds is primary insurance. If the additional insureds have other insurance which might be applicable to any loss, the amount of this insurance shall not be reduced or prorated by the existence of such other insurance.

The Contractual Liability Insurance afforded is sufficiently broad to insure all of the matters set forth in the article entitled "Indemnity" in the General Provisions of the above-referenced contract except those matters set forth in the third paragraph thereof.

This endorsement does not increase the Company's total limits of liability.

Named Insured (Contractor)

Insurance Company

Street Number

Street Number

City and State

City and State

By: _____
(Company Representative)

(SEE NOTICE ON PAGE 2 OF 2)

State of _____)

County of _____)
) ss.

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

On _____ before me, _____
Date Here Insert Name and Title of the Officer

Personally appeared _____
Name(s) of Signer(s)

Who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the withing instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal

NOTARY PUBLIC

NOTICE:

No substitution or revision to the above endorsement form will be accepted. If the insurance called for is provided by more that one policy, a separate endorsement in the exact form shall be provided for each policy.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.

CERTIFICATE OF INSURANCE

Name of Contract: **THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS**

Name of Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT**

Type of Insurance: **BUILDERS' RISK "ALL RISK" INSURANCE**

THIS IS TO CERTIFY that the following policy has been issued by the below-stated company in conformance with the requirements of Articles 8-1 and 8-4 of the General Provisions and is in force at this time:

POLICY NUMBER	EXPIRATION DATE	LIMITS OF LIABILITY
		\$
		(Not Less Than Contract Amount)
		Deductible:
		\$
	(Not Sooner Than Contract Completion Date)	(Not More Than \$100,000)

This certificate or verification of insurance is not an insurance policy and does not amend, extend, or alter the coverage afforded by the policies listed herein. Notwithstanding any requirement, term, or condition of any contract or other document with respect to which this certificate or verification of insurance may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions, and conditions of such policies.

The Company will give at least 30 days' written notice by certified mail to the Owner and the Engineer/Architect prior to any material change or cancellation of said policy.

Named Insured (Contractor)

Insurance Company

Street Number

Street Number

City and State

City and State

By: _____
(Company Representative)

(SEE NOTICE ON PAGE 3 OF 3)

State of _____)

County of _____)

ss.

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

On _____ before me, _____
Date Here Insert Name and Title of the Officer

Personally appeared _____
Name(s) of Signer(s)

Who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the withing instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal

NOTARY PUBLIC

Insurance Company Agent for Service

of Process in California:

Name

Agency

Street Number

Street Number

City and State

City and State

Telephone Number

Telephone Number

NOTICE:

No substitution or revision to the above certificate form will be accepted. If the insurance called for is provided by more than one insurance company, a separate certificate in the exact above form shall be provided for each insurance company.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.

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INSURANCE ENDORSEMENT

Name of Contract: **THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS**

Name of Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT**

Type of Insurance: **BUILDERS' RISK "ALL RISK" INSURANCE**

This endorsement forms a part of Policy No. _____.

ENDORSEMENT:

The Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents are included as additional insureds under said policy but only while acting in their capacity as such with respect to the above-referenced contract.

The insurance afforded to these additional insureds is primary insurance. If the additional insureds have other insurance which might be applicable to any loss, the amount of this insurance shall not be reduced or prorated by the existence of such other insurance.

This endorsement does not increase the Company's total limits of liability.

Named Insured (Contractor)

Insurance Company

Street Number

Street Number

City and State

City and State

By: _____
(Company Representative)

(SEE NOTICE ON PAGE 2 OF 2)

State of _____)
County of _____) ss.

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

On _____ before me, _____
Date Here Insert Name and Title of the Officer

Personally appeared _____
Name(s) of Signer(s)

Who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the withing instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal

NOTARY PUBLIC

NOTICE:

No substitution or revision to the above endorsement form will be accepted. If the insurance called for is provided by more than one policy, a separate endorsement in the exact above form shall be provided for each policy.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.

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GENERAL PROVISIONS

SECTION 1 DEFINITIONS, TERMS, AND ABBREVIATIONS

1-1 DEFINITIONS

Whenever the following terms occur in the Contract Documents, the meaning shall be interpreted as follows:

ACCEPTANCE, FINAL ACCEPTANCE - The formal action by the Owner accepting the work as being complete.

ACCEPTED BID - The bid accepted by the Owner.

ATTORNEY FOR OWNER – Alfred E. Smith, Nossaman, LLP, 777 S. Figueroa Street, 34th Floor, Los Angeles, CA. 90017, (213) 612-7831

BIDDER - Any individual, partnership, corporation, joint venture, or other combination thereof submitting a bid for the work contemplated, acting directly or through an authorized representative.

CALENDAR DAY - Means all days of the week including Saturdays, Sundays and Holidays with the first day counted being the first day following the date specified.

CONTRACT - The written agreement executed between the Owner and the Contractor covering the performance of the work.

CONTRACTOR - The individual, partnership, corporation, joint venture, or other combination thereof who has entered into the contract with the Owner for the performance of the work. The term "Contractor" means the Contractor or his authorized representative.

CONTRACT DOCUMENTS - The Contract Documents set forth in the Agreement; also any and all supplemental agreements amending or extending the work contemplated. Supplemental agreements are written agreements covering alterations, amendments, or extensions to the contract and include contract change orders.

DAYS - Unless otherwise specified, days shall mean calendar days.

ENGINEER/ARCHITECT – The term "Engineer/Architect" means the Engineer/Architect or his authorized representative.

OWNER - The public entity identified as such in the Agreement. The term "Owner" means the Owner or his authorized representative.

OWNER'S REPRESENTATIVE - The person or firm authorized by the Owner to represent it during the performance of the work by the Contractor. The term "Owner's Representative" means the Owner's Representative or his assistants.

PLANS, DRAWINGS - The Plans (drawings), or reproductions thereof, which show the location, character, dimensions, and details of the work to be done.

SPECIAL PROVISIONS - Additions, deletions, and changes to the General Provisions and Standard Specifications.

SPECIFICATIONS - The directions, provisions, and requirements contained in the General Provisions and Standard Specifications as supplemented by the Special Provisions.

STANDARD SPECIFICATIONS - The Contract Documents identified or referenced as such.

SUBCONTRACTOR - An individual, partnership, corporation, joint venture, or other combination thereof who has a contract with the Contractor to perform any of the work at the site. Subcontractor also means an individual, partnership, corporation, joint venture, or other combination thereof who has a contract with another subcontractor to perform any of the work at the site.

STANDARD DRAWINGS, STANDARD PLANS - That portion of the Plans identified or referenced as such.

UTILITY - Public or private fixed works for the transportation of fluids, gases, power, signals, or communications.

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

1-2 TERMS

Wherever the terms "required," "permitted," "ordered," "designated," "directed," "prescribed," or terms of like import are used, it shall be understood that the requirements, permission, order, designation, direction, or prescription of the Owner's Representative is intended. Similarly, the terms "acceptable," "satisfactory," "or equal," or terms of like import shall mean acceptable to or satisfactory to the Owner's Representative, unless otherwise expressly stated. The word "provide" shall be understood to mean furnish and install.

1-3 ABBREVIATIONS

Wherever abbreviations are used, they shall have the meanings as set forth in the Special Provisions.

SECTION 2 BID REQUIREMENTS AND CONDITIONS

2-1 CONTRACT DOCUMENTS

The Contract Documents are set forth in the Agreement form and the definition of "Contract Documents" is in Article 1-1 DEFINITIONS.

2-2 LICENSE AND BIDDER'S EXPERIENCE

No bid will be accepted from a bidder who is not licensed to conduct business in the state of California and licensed to perform the class of work defined by the Contract Documents. All bidders shall complete the Bidder's Experience form as part of their bid. Bidders failing to complete and submit the Bidder's Experience form with their bid may be treated as nonresponsive at the option of the Owner. Bidders unable to demonstrate five (5) years of successful prior experience performing the type and magnitude of work required by this contract may also be rejected as nonresponsive.

2-3 BIDS

Bids shall be made upon the Bid Form furnished by the Owner and a part of the Contract Documents. The Bid Form Checklist, Bid Form and Bid Bond must be submitted with the bid. All bids shall be properly executed and with all items filled in; the signatures of all persons signing shall be in longhand. Erasures, interlineations, or other corrections shall be authenticated by affixing in the margin immediately opposite the correction the initials of a person signing the bid. Written amounts shall govern in case of discrepancy between the amounts stated in writing and the amounts stated in figures. If the unit price and the total amount named by a bidder for any item are not in agreement, the unit price alone shall be considered as representing the bidder's intention, and the totals shall be corrected to conform thereto.

Bids shall not contain any recapitulation of the work to be done. Alternative bids will not be considered, except as called for. No oral, telegraphic, or telephonic bids or modifications will be considered.

Bids shall be accompanied by a "Bid Guarantee" in the form of cash, a cashier's check, a certified check, or bidder's bond executed by an admitted surety insurer, in an amount not less than 10% of the amount of bid, and made payable to or for the benefit of the Owner. Said cash, check, or bond shall be given as a guarantee that the bidder will enter into a contract and furnish the required bonds or substitutes and insurance certificates and endorsements if awarded the contract, and in case of refusal or failure to enter into said contract and furnish the required bonds or substitutes and insurance certificates and endorsements within 15 calendar days after notice of award by the Owner in writing, the cash or the check and the money represented by said check shall be forfeited to the Owner, or in the event that a bond is deposited, said security shall be forfeited. Forfeiture does not preclude the Owner from seeking all other remedies provided by law to recover losses sustained as a result of the Contractor's failure to enter into the contract or to furnish the required bonds or insurance certificates and endorsements.

Bids shall be sealed in an envelope marked and addressed as set forth in the Notice Inviting Sealed Bids. Bids shall be delivered to personnel of the Owner at the location designated in the Notice Inviting Sealed Bids on or before the day and hour set for the opening of bids.

2-4 WITHDRAWAL OF BID

A bidder may withdraw his bid by a signed written request any time prior to the day and hour for receiving bids designated in the Notice Inviting Sealed Bids. Thereafter the Bid may be withdrawn only as permitted in accordance with Public Contract Code Section 5100, et seq., regarding relief of Bidders.

The withdrawal of a bid does not prejudice the right of a bidder to file a new bid so long as the new bid is delivered as set forth in Article 2-3 BIDS prior to the closing time specified for all bids.

2-5 BIDDERS INTERESTED IN MORE THAN ONE BID

No person, partnership, or corporation shall be allowed to make or file, or be interested in more than one bid for the work, unless alternative bids are called for. A person, partnership, or corporation submitting a subbid to a bidder, or who has quoted prices on material to a bidder, is not thereby disqualified from submitting a subbid or quoting prices to other bidders.

2-6 INTERPRETATION OF PLANS AND OTHER CONTRACT DOCUMENTS

If any person or entity contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of the Plans, Specifications, or other Contract Documents, or finds discrepancies in, or omissions from the Plans and Specifications or other Contract Documents, he may submit to the Owner a written request for an interpretation or correction thereof. The person submitting the request will be responsible for its prompt delivery. An interpretation or correction of the Contract Documents will be made only by Addendum duly issued by the Owner and made available on the District website at www.olivenhain.com. The Owner and the Engineer/Architect will not be responsible for any other explanation or interpretation of the documents.

2-7 ADDENDA

Addenda issued before the time in which to submit bids expires shall be included in the bid and shall be made a part of the contract.

2-8 EXISTING CONDITIONS AND EXAMINATION OF CONTRACT DOCUMENTS

The bidder represents that he has carefully examined the Contract Documents and the site where the work is to be performed and that he has familiarized himself with all local conditions and federal, state and local laws, ordinances, rules, and regulations that may affect in any manner the performance of the work. The bidder further represents that he has studied all surveys and investigation reports about subsurface and latent physical conditions pertaining to the jobsite, that he has performed such additional surveys and investigations as he deems necessary to complete the work at his bid price, and that he has correlated the results of all such data with the requirements of the Contract Documents. The submittal of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, including locality, uncertainty of weather and all other contingencies, and as to the character, quality, quantities, and scope of the work.

The Plans and Specifications for the work show subsurface conditions or otherwise hidden conditions as they are supposed or believed by the Engineer/Architect to exist; but it is not

intended or to be inferred that the conditions as shown thereon constitute a representation that such conditions are actually existent. Except as otherwise specifically provided in the Contract Documents, the Owner, the Engineer/Architect, and their consultants shall not be liable for any loss sustained by the Contractor as a result of any variance of such conditions as shown on the Plans and the actual conditions revealed during the progress of the work or otherwise.

Where the Owner or the Engineer/Architect or their consultants have made investigations of subsurface conditions in areas where the work is to be performed, such investigations were made only for the purpose of study and design. The conditions indicated by such investigations apply only at the specific location of each boring or excavation at the time the borings or excavations were made. Where such investigations have been made, bidders or Contractors may inspect the records as to such investigations subject to and upon the conditions hereinafter set forth. The inspection of the records shall be made at the office of the Engineer/Architect.

The records of such investigations are not a part of the contract and are shown solely for the convenience of the bidder or Contractor. It is expressly understood and agreed that the Owner, the Engineer/Architect, and their consultants assume no responsibility whatsoever in respect to the sufficiency or accuracy of the investigations; the records thereof; or of the interpretations set forth therein or made by the Owner's consultants, the Engineer/Architect or his consultants in the use thereof by the Engineer/Architect, and there is no warranty or guarantee, either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such areas, or any part thereof, or that unlooked-for developments may not occur, or that materials other than, or in proportions, densities, or other characteristics different from, those indicated may not be encountered.

When a log of test borings showing a record of the data obtained by the investigation of subsurface conditions by the Owner, the Engineer/Architect, or their consultants is included with the Plans or other documents, it is expressly understood and agreed that said log of test borings does not constitute a part of the contract, represents only the opinion of the Owner or the Engineer/Architect or their consultants as to the character of the materials encountered by them in the test borings, is included in the Plans or other documents only for the convenience of bidders, and its use is subject to all of the conditions and limitations set forth in this article.

The availability or use of information described in this article is not to be construed in any way as a waiver of the provisions of the first paragraph in this article and a bidder or Contractor is cautioned to make such independent investigations and examination as he deems necessary to satisfy himself as to conditions to be encountered in the performance of the work.

No information derived from such inspection of records of investigations or compilation thereof made by the Owner, the Engineer/Architect, or their consultants will in any way relieve the bidder or Contractor from any risk or from properly fulfilling the terms of the contract nor entitle the Contractor to any additional compensation.

SECTION 3 AWARD AND EXECUTION OF CONTRACT

3-1 AWARD OF CONTRACT OR REJECTION OF BIDS

The award of the contract, if it be awarded, will be to the lowest responsible responsive bidder complying with the instructions contained in the Contract Documents. The Owner, however, reserves the right to select the schedules under which the bids are to be compared; to delete certain bid items from the Bid Schedule, to reject any and all bids, and to waive any irregularity in bids received. If, in the judgment of the Owner, a bid is unbalanced or if the bidder is not responsible, it shall be considered sufficient grounds for rejection of the entire bid.

The Owner shall have the period of time set forth in the Special Provisions after the opening of bids within which to accept or reject the bids. No bidder may withdraw his bid during said period. The Owner will return the bid guarantees, except any guarantees which have been forfeited, and except bidders' bonds, to the respective bidders whose bid they accompanied after the execution of the contract by the successful bidder or rejection of all bids or upon receipt of a written request therefor received after said period of time set forth in the Special Provisions.

Before award of the contract, any bidder shall furnish upon request proof of required insurance, a recent statement of his financial condition, and previous construction experience or such other evidence of his qualifications as may be requested by the Owner. If a bidder fails to furnish in a timely manner the information requested, it shall be considered sufficient grounds for rejection of such bidder's entire bid.

3-2 EXECUTION OF CONTRACT

The form of agreement, bonds, and other documents which the successful bidder, as Contractor, will be required to execute are included as a part of the Contract Documents.

The contract shall be signed by the successful bidder and returned to the Owner, together with the bonds or substitutes and insurance certificates and endorsements, within 15 calendar days or such additional time as may be allowed by the Owner from the date of the mailing of notice from the Owner to the bidder or from the date of personal delivery of notice from the Owner to the bidder that the agreement is ready for signature. The agreement, bonds or substitutes, insurance certificates and endorsements, and other documents to be executed by the Contractor shall be executed in original-quadruplicate, one each of which shall be filed with the Owner and one each with the Attorney for the Owner and the Engineer/Architect for the Owner.

3-3 BONDS

The successful bidder, simultaneously with execution of the Contract Documents, shall either furnish a Payment Bond and Performance Bond each in an amount equal to 100% of the contract amount, or equivalent cash or securities in lieu of these bonds in accordance with Code of Civil Procedure Section 995.710. The failure of Contractor to make a written request to Owner to use alternative securities meeting the requirements of Code of Civil Procedure Section 995.710 at the time the Contract Documents are signed shall be deemed a waiver of the right of Contractor to subsequently substitute these alternative securities. Alternative securities proposed by the Contractor shall be subject to review and approval by Owner. Contractor agrees to provide

Owner with a deposit in a sum determined adequate by the Owner to cover all attorney's fees and all other fees, costs, and expenses incurred by the Owner in reviewing Contractor's request to use alternative securities in lieu of the required bonds and to prepare all agreements determined necessary by Owner to adequately protect Owner's interest. Performance and Payment Bonds shall be furnished by surety companies meeting the requirements of Code of Civil Procedure Section 995.660(a) and shall be completed on the forms furnished as part of the Contract Documents. Surety companies, to be acceptable to Owner, must meet all requirements of Code of Civil Procedure Section 995.660(a).

If at any time a surety on any such bond fails to comply with Code of Civil Procedure Section 995.660(a), the Contractor shall, within 10 calendar days after notice from the Owner, substitute new bonds with surety companies meeting all requirements of Code of Civil Procedure Section 995.660(a). All premiums on these new bonds shall be paid solely by the Contractor. No further progress payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished new bonds to Owner meeting all requirements of Code of Civil Procedure Section 995.660(a).

The Performance Bond and the Payment Bond, or alternative securities meeting the requirements of Code of Civil Procedure Section 995.710 approved by the Owner, must remain in full effect throughout the period of the Work and for a period of two-year thereafter as required by Article 5-14 TWO-YEAR GUARANTEE.

3-4 INSURANCE REQUIREMENTS

The successful bidder will be required to furnish the Owner proof of full compliance with all insurance requirements as specified in SECTION 8 CONTRACTOR'S INSURANCE. The forms of Certificate of Insurance and Endorsement which the successful bidder, as Contractor, will be required to furnish are included as a part of the Contract Documents.

3-5 FAILURE TO EXECUTE CONTRACT

Failure by a bidder to whom the contract is awarded to execute the contract or to furnish the required bonds or insurance certificates and endorsements within the period of time required by Section 3-2 Execution of Contract shall be just cause for the annulment of the award and the forfeiture of the bid guarantee.

A bidder who is awarded the contract and fails to execute the contract or furnish the required bonds or substitutes, or insurance certificates and endorsements shall be liable to the Owner for all damages resulting therefrom including reasonable attorneys' fees. The bid guarantee forfeited shall not be a limitation thereon.

SECTION 4 SCOPE OF WORK

4-1 WORK TO BE DONE

The work to be done consists of furnishing all transportation, labor, materials, tools, equipment, services, permits, utilities and all other items which are necessary or appurtenant to construct and complete the entire project and construct the project designated in the Contract Documents, and to leave the grounds in a neat and presentable condition.

4-2 CHANGES IN THE WORK

The Owner may require changes in, additions to, or deductions from the work, including complete termination thereof. Adjustment, if any, in the amounts to be paid to the Contractor by reason of any such change, addition, or deduction shall be determined as set forth in SECTION 9 ESTIMATES AND PAYMENTS.

The Owner's Representative may order minor changes in the work not involving an increase or decrease in the contract amount, not involving a change in the time for completion, and not inconsistent with the purposes for which the work is being constructed. **If the Contractor believes that any order for minor changes in the work for which the contract amount or time for completion should be changed, he shall not proceed with the changes in the work so ordered and shall within seven calendar days of the receipt of such order notify the Owner's Representative in writing of his estimate of the changes in the contract amount and time for completion he believes to be appropriate.**

No payment for changes in the work will be made and no changes in the time for completion by reason of changes in the work will be made, unless the changes are covered by a written change order approved by the Owner in advance of the Contractor's proceeding with the changed work.

4-3 OBSTRUCTIONS

The Contractor shall remove and dispose of all structures, debris, or other obstructions of any character necessary to accommodate the work. Where such obstructions consist of improvements not required by law to be removed by the owner thereof, all such improvements shall be removed, maintained, and permanently replaced by the Contractor at his expense except as otherwise specifically provided in the Contract Documents.

4-4 UTILITIES

The Engineer/Architect has endeavored to determine the existence of utilities at the site of the work from the records of the owners of known utilities in the vicinity of the work. The positions of these utilities as derived from such records are shown on the Plans. The service connections to these utilities are not shown on the Plans.

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

facilities not identified in the Plans or Specifications or in a position different from that shown in the Plans and Specifications, he shall immediately notify in writing the Owner's Representative and the owner of the utility facility.

The Owner shall have the responsibility for the timely removal, relocation, protection, and temporary maintenance of existing main or trunkline utility facilities which are not indicated in the Plans and Specifications with reasonable accuracy.

In case it should be necessary to remove, relocate, protect, or temporarily maintain a utility because of interference with the work, the work on such utility shall be performed and paid for as follows:

When it is necessary to remove, relocate, protect, or temporarily maintain an existing main or trunkline utility facility not indicated in the Plans and Specifications with reasonable accuracy, the Owner will compensate the Contractor for the costs of locating, for the costs of repairing damage not due to the failure of the Contractor to exercise reasonable care, for the costs of removing, relocating, protecting, or temporarily maintaining such utility facilities, and for the costs for equipment on the site necessarily idled during such work. These costs, the work to be done by the Contractor in locating, removing, relocating, protecting, or temporarily maintaining such utility facilities shall be covered by a written change order conforming to the provisions of Article 4-2 CHANGES IN THE WORK and Article 9-1 PAYMENT FOR CHANGES IN THE WORK. The Owner may make changes in the alignment and grade of the work to obviate the necessity to remove, relocate, protect, or temporarily maintain such utility facilities or to reduce the costs of the work involved in removing, relocating, protecting, or temporarily maintaining such utility facilities. Changes in alignment and grade will be ordered in accordance with Article 4-2 CHANGES IN THE WORK.

When it is necessary to remove, relocate, protect, or temporarily maintain a utility (other than [1] existing main or trunkline utility facilities not indicated in the Plans and Specifications with reasonable accuracy, or [2] existing service laterals or appurtenances when their presence cannot be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the work) the cost of which is not required to be borne by the owner thereof, the Contractor shall bear all expenses incidental to the work on the utility or damage thereto. The work on the utility shall be done in a manner satisfactory to the owner thereof; it being understood that the owner of the utility has the option of doing such work with his own forces, or permitting the work to be done by the Contractor. No representations are made that the obligations to remove, relocate, protect, or temporarily maintain any utility and to pay the cost thereof is or is not required to be borne by the owner of such utility, and it shall be the responsibility of the Contractor to investigate to find out whether or not said cost is required to be borne by the owner of the utility.

The right is reserved to governmental agencies and to owners of utilities to enter at any time upon any street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the work and for the purpose of maintaining and making repairs to their property.

4-5 PLANS AND SPECIFICATIONS FURNISHED BY THE OWNER

The Owner will furnish to the Contractor PDF copies of Plans and Specifications necessary for the execution of the work. The Contractor shall keep one set of Plans and Specifications in good order with red line changes available to the Owner's Representative at the site of the work.

4-6 FINAL CLEANUP

Upon completion and before making application for acceptance of the work, the Contractor shall clean all rights-of-way, streets, borrow pits, and all other grounds occupied by him in connection with the work of all rubbish, excess materials, temporary structures, and equipment, and all parts of the work and grounds occupied by him shall be left in a neat and presentable condition.

SECTION 5 QUALITY OF THE WORK

5-1 AUTHORITY OF THE OWNER'S REPRESENTATIVE

The Owner's Representative shall decide any and all questions which may arise as to the interpretation of the Plans and Specifications and shall have authority to disapprove or reject materials and equipment furnished and work performed which, in his opinion, is not in accordance with the Contract Documents. The Owner's Representative shall also have the authority to require the Contractor or any subcontractor to replace any workman or supervisor who, in his opinion, is not performing the work in a safe manner, fails to follow the instructions of the Owner's Representative, fails to perform work in accordance with the Contract Documents, fails to properly supervise the work, or demonstrates lack of competence to perform the particular work assigned to the workman or supervisor. The failure of the Contractor or any subcontractor to replace a worker or supervisor as directed by the Owner's Representative shall constitute a material breach of this agreement. Neither the Owner's Representative nor the Owner shall be liable to Contractor, any subcontractor, or any other person or entity for removing a workman or supervisor in accordance with the terms of this article.

5-2 SUPPLEMENTAL DRAWINGS

The Plans shall be supplemented by such drawings as are necessary to better define the work. All such drawings delivered to the Contractor by the Owner's Representative shall be deemed written instructions to the Contractor. If the Contractor believes that any supplemental drawings call for changes in the work for which the contract amount or time for completion should be changed, he shall not proceed with the changes in the work so called for and shall within seven calendar days of the receipt of the supplemental drawings notify the Owner's Representative in writing of his estimate of the changes in the contract amount and time for completion he believes to be appropriate.

No payment for changes in the work will be made and no change in the time for completion by reason of changes in the work will be made, unless the changes are covered by a written change order approved by the Owner in advance of the Contractor's proceeding with the changed work.

5-3 CONFORMITY WITH CONTRACT DOCUMENTS AND ALLOWABLE DEVIATIONS

The work shall conform to the lines, grades, dimensions, tolerances, and material and equipment requirements shown on the Plans or set forth in the Specifications. Although measurement, sampling, and testing may be considered evidence as to such conformity, the Owner's Representative shall be the sole judge as to whether the work or materials deviate from the Plans and Specifications, and his decision as to any allowable deviations therefrom shall be final.

If specific lines, grades, and dimensions are not shown on the Plans, those furnished by the Owner's Representative shall govern.

5-4 MANUFACTURER'S INSTRUCTIONS

All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, supplier, or distributor, except as otherwise specifically provided in the Contract Documents.

5-5 COORDINATION OF PLANS AND SPECIFICATIONS

The Plans, Specifications, and other Contract Documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for the complete work. In the event of an apparent difference between Plans and Specifications, reference shall be made to the Owner's Representative whose decision thereon shall be final.

Special Provisions shall govern over General Provisions and Standard Specifications.

5-6 INTERPRETATION OF PLANS AND SPECIFICATIONS

Figured dimensions on drawings shall govern, but work not dimensioned shall be as directed. Work not particularly shown or specified shall be the same as similar parts that are shown or specified. Large-scale details shall take precedence over smaller scale drawings as to shape and details of construction. Specifications shall govern as to materials and workmanship. Plans and Specifications are intended to be fully complementary and to agree. The Specifications calling for the higher quality material or workmanship shall prevail. Materials or work described in words which so applied have a well known technical or trade meaning shall be deemed to refer to such recognized standards. In the event of any discrepancy between any drawings and the figures thereon, the figures shall be taken as correct. In the event of any doubt or question arising respecting the true meaning of the Plans or Specifications, reference shall be made to the Owner's Representative whose decision thereon shall be final.

5-7 ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR

It is the duty of the Contractor to promptly notify the Owner's Representative in writing of any design, materials, or specified method that the Contractor believes may prove defective or insufficient. If the Contractor believes that a defect or insufficiency exists in design, materials, or specified method and fails to promptly notify the Owner's Representative in writing of this belief,

the Contractor waives any right to assert that defect or insufficiency in design, materials, or specified method at any later date in any legal or equitable proceeding against Owner, or in any subsequent mediation, arbitration, or settlement conference between the Owner and the Contractor. The Owner's Representative, on receipt of any such notice, will promptly investigate the circumstances and give appropriate instructions to the Contractor. Until such instructions are given, any work done by the Contractor after he comes to the belief that a defect or insufficiency exists in design, materials, or specified method which is directly or indirectly affected by such alleged defect or insufficiency in design, materials, or specified method will be at his own risk and he shall bear all cost arising therefrom.

If the Contractor, either before commencing work or in the course of the work, finds any discrepancy between the Plans and the Specifications or between either of them and the physical conditions at the site of the work or finds any error or omission in any of the Plans or in any survey, he shall promptly notify the Owner's Representative of such discrepancy, error, or omission. If the Contractor observes that any Plans or Specifications are at variance with any applicable law, ordinance, regulation, order, or decree, he shall promptly notify the Owner's Representative in writing of such conflict. The Owner's Representative, on receipt of any such notice, will promptly investigate the circumstances and give appropriate instructions to the Contractor. Until such instructions are given, any work done by the Contractor after his discovery of such error, discrepancy, or conflict which is directly or indirectly affected by such error, discrepancy, or conflict will be at his own risk and he shall bear all cost arising therefrom.

5-8 SUPERVISION AND SUPERINTENDENCE

The Contractor shall supervise and direct the work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the work in accordance with the Contract Documents.

The Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but the Contractor shall not be solely responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence, or procedure of construction which is indicated in and required by the Contract Documents except as otherwise provided in Article 5-7 ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR.

The Contractor shall be responsible to see that the completed work complies with the Contract Documents.

The Contractor shall designate and keep on the work at all times during its progress a competent superintendent who shall not be replaced without written notice to the Owner's Representative. The superintendent will be the Contractor's representative at the site and shall have authority to act on behalf of the Contractor. All communications given to the superintendent shall be as binding as if given to the Contractor. During periods when the work is suspended, the Contractor shall make appropriate arrangements for any emergency work which may be required.

Whenever the superintendent is not present on any particular part of the work where the Owner's Representative may desire to inform the Contractor relative to interpretation of the Plans and

Specifications or to the disapproval or rejection of materials or work performed, the Owner's Representative may so inform the foreman or other worker in charge of the particular part of the work in reference to which the information is given. Information so given shall be as binding as if given to the superintendent.

5-9 SHOP DRAWINGS

Shop drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier, or distributor and which illustrates some portion of the work.

The Contractor shall review, mark with his approval, and submit for review by the Owner's Representative shop drawings as called for in the Special Provisions and Standard Specifications or requested by the Owner's Representative. Shop drawings shall be submitted by email as a PDF to the Owner's Representative and be accompanied by the Shop Drawing Submittal Form included at the end of the General Provisions. Shop drawings shall show the name of the project, the name of the Contractor, and, if any, the names of suppliers, manufacturers, and subcontractors. Shop drawings shall be submitted with promptness and in orderly sequence so as to cause no delay in prosecution of the work.

Shop drawings shall be complete in all respects. If the shop drawings show any deviations from the requirements of the Plans and Specifications because of standard shop practices or other reasons, the deviations and the reasons therefor shall be set forth in the Shop Drawing Submittal Form.

By submitting shop drawings, the Contractor represents that material, equipment, and other work shown thereon conforms to the Plans and Specifications, except for any deviations set forth in the Shop Drawing Submittal Form. A log shall be maintained by the Contractor showing the following information: sequential shop drawings number brief description, date submitted, date approved, any other data relevant to the shop drawings.

Within 30 calendar days after receipt of said shop drawings, the Owner's Representative will return via electronic mail (email), of the shop drawings to the Contractor with any comments noted thereon.

If so noted by the Owner's Representative, the Contractor shall correct the drawings and resubmit them in the same manner as specified for the original submittal. The Contractor in the Shop Drawing Submittal Form accompanying resubmitted shop drawings shall direct specific attention to revisions other than the corrections requested by the Owner's Representative on previous submittals.

The review by the Owner's Representative is only of general conformance with the design concept of the project and general compliance with the Plans and Specifications and shall not be construed as relieving the Contractor of the full responsibility for: providing materials, equipment, and work required by the contract; the proper fitting and construction of the work; the accuracy and completeness of the shop drawings; selecting fabrication processes and techniques of construction; and performing the work in a safe manner.

No portion of the work requiring a shop drawing submittal shall be commenced until the submittal has been reviewed by the Owner's Representative and returned to the Contractor with a notation indicating that resubmittal is not required.

If the Contractor believes that any shop drawing or communication relative thereto calls for changes in the work for which the contract amount or time for completion should be changed, he shall not proceed with the changes in the work so called for and shall within seven calendar days of the receipt of the shop drawings notify the Owner's Representative in writing of his estimates of the changes in the contract amount and time for completion he believes to be appropriate.

No payment for changes in the work will be made and no change in the time for completion by reason of changes in the work will be made, unless the changes are covered by a written change order approved by the Owner in advance of the Contractor's proceeding with the changed work.

5-10 QUALITY AND SAFETY OF MATERIALS AND EQUIPMENT

All equipment, materials, and supplies to be incorporated in the work shall be new, unless otherwise specified. All equipment, materials, and supplies shall be produced in a good and workmanlike manner. When the quality of a material, process, or article is not specifically set forth in the Plans and Specifications, the best available quality of the material, process, or article shall be provided.

Whenever any material, process, or article is indicated or specified by grade, patent or proprietary name, or by name of manufacturer, such Specification shall be deemed to be used for the purpose of facilitating description of the materials, process, or articles desired and shall be deemed to be followed by the words "or equal", and the Contractor may offer any material, process, or article which shall be substantially equal or better in every respect to that so indicated or specified; provided, however, that if the material, process, or article offered by the Contractor is not, in the opinion of the Owner's Representative, equal or better in every respect to that specified, then the Contractor must furnish the material, process, or article specified or one that in the opinion of the Owner's Representative is the substantial equal or better in every respect. In the event that the Contractor furnishes material, process, or article more expensive than that specified, the difference in cost of such material, process, or article so furnished shall be borne by the Contractor.

In accordance with Public Contract Code Section 3400, the Contractor shall submit data substantiating requests for substitution of "equal" items within 35 calendar days after award of the contract. This 35-day period of time is included in the number of days allowed for the completion of the work.

All materials, equipment, and supplies provided shall, without additional charge to Owner, fully conform with all applicable state and federal safety laws, rules, regulations, and orders, and it shall be Contractor's responsibility to provide only such materials, equipment, and supplies notwithstanding any omission in the Contract Documents therefor or that a particular material, equipment, or supply was specified.

All machinery and equipment provided by the Contractor for the work shall include locking mechanisms capable of locking any shut-down devices on the machinery and equipment before commencement of any repairs or other work. Any machinery or equipment provided by the Contractor, which does not have this locking ability, shall be altered at the expense of the Contractor to provide these locking mechanisms without compromising any safety features on the equipment or machinery prior to the commencement of any repairs or work on the equipment or machinery. The Contractor shall not commence any work or repairs on any machinery or equipment which has been shut down until the locking mechanism has been activated and the Contractor has tagged the applicable machinery or equipment with a tag stating "Danger Do Not Operate." This tag shall include the name of the employee who locked the equipment prior to the commencement of any work or repairs. The Contractor shall insure that all equipment and machinery fully complies with Title 8 of California Administrative Code Sections 3202, 3314, 6003, 2320.4-2320.6, 2530.43, and 2530-86 at all times during performance of the work.

5-11 STANDARDS, CODES, SAMPLES, AND TESTS

Whenever reference is made to a standard, code, Specification, or test and the designation representing the date of adoption or latest revision thereof is omitted, it shall mean the latest revision of such standard, code, Specification, or test in effect on the day the Notice Inviting Sealed Bids is dated.

Tests shall be made in accordance with commonly recognized procedures of technical organizations and such special procedures as may be prescribed elsewhere in the Plans and Specifications. The Contractor shall furnish without charge such samples for testing as may be required by the Owner's Representative.

5-12 OBSERVATION OF WORK BY OWNER'S REPRESENTATIVE

The Owner's Representative shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining full knowledge respecting the progress, workmanship, and character of materials and equipment used and employed in the work.

Whenever the Contractor varies the normal period during which work or any portion of it is carried on each day, he shall give timely notice to the Owner's Representative so that the Owner's Representative may, if he wishes, be present to observe the work in progress. If the Contractor fails to give such timely notice, any work done in the absence of the Owner's Representative will be subject to rejection.

The Contractor shall give timely notice to the Owner's Representative in advance of backfilling or otherwise covering any part of the work so that the Owner's Representative may, if he wishes, observe such part of the work before it is concealed.

The observation, if any, by the Owner's Representative of the work shall not relieve the Contractor of any of his obligations to fulfill the contract as prescribed. Defective work shall be made good, and materials and equipment furnished and work performed which is not in accordance with the Contract Documents may be rejected notwithstanding the fact that such

materials, equipment, and work have been previously observed by the Owner's Representative or that payment therefor has been included in an estimate for payment.

5-13 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

Any work which does not conform the requirements of the Contract Documents or which is found unacceptable or deficient by the Owner or the Owner's Representative shall be remedied or removed and replaced by the Contractor at the Contractor's sole cost and expense, together with any other work which may be displaced in so doing, and no compensation will be allowed the Contractor for such removal, replacement, or remedial work. All materials found inadequate or deficient by the Owner or the Owner's Representative shall be immediately removed from the site.

Any work done beyond the lines and grades shown on the Plans or established by the Owner or any changes in, additions to, or deductions from the work done without written authority from the Owner will be considered as unauthorized and will not be paid for. Work so done will be ordered remedied, removed, or replaced by the Owner or the Owner's Representative at the Contractor's sole cost and expense.

Upon failure on the part of Contractor to comply promptly with any order of the Owner or Owner's Representative made under the provisions of this article the Owner or Owner's Representative shall have authority to cause all non-conforming materials, rejected work, or unauthorized work to be remedied, removed, or replaced at the Contractor's sole cost and expense and to deduct all fees and costs incurred by the Owner including staff time from any monies due or to become due the Contractor under this contract.

5-14 TWO-YEAR GUARANTEE

Besides guarantees required elsewhere, the Contractor shall and hereby does guarantee all work, materials, parts, equipment and supplies to be free from all defects due to faulty materials or workmanship for a period of two-years after the date of formal acceptance of the work by the Board of Directors of Owner except for any portion of the work that is utilized or placed into service by the Owner in accordance with the provisions of Article 6-6 USE OF COMPLETED PORTIONS. The guarantee period for portions of the work so utilized or placed into service shall be two-years commencing on the date of the written notification to the Contractor described in Article 6-6 USE OF COMPLETED PORTIONS. The Contractor shall repair or remove and replace any and all such work, together with any other work which may be displaced in so doing, that is found to be defective by Owner in workmanship and/or materials, equipment, parts or supplies within the two-year period, at the Contractor's sole cost and expense, ordinary wear and tear and unusual abuse or neglect excepted. In the event the Contractor fails to correct all defects identified by the Owner within seven (7) consecutive days after written notice of the defects from Owner, the Owner is hereby authorized to proceed to have the defects remedied and made good at the sole expense of the Contractor who hereby agrees to pay the cost and charges therefore immediately on demand. Such action by the Owner will not relieve the Contractor of the guarantees required by this article or elsewhere in the Contract Documents.

The Performance Bond and the Payment Bond shall continue in full force and effect for the guarantee period.

If, in the opinion of the Owner, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to the Owner or to prevent interruption of operations of the Owner, the Owner may require the Contractor to correct the defects in a shorter period of time determined solely by Owner. If the Contractor does not correct the defects within the time specified by Owner, Owner may proceed to make such corrections or provide such attention; and all fees and costs of such correction or attention shall be charged against the Contractor. Such action by the Owner will not relieve the Contractor of the guarantees required by this article or elsewhere in the Contract Documents.

This article does not in any way limit the guarantee on any items for which a longer guaranty is specified or on any items for which a manufacturer or supplier gives a guarantee for a longer period. The Contractor agrees to act as a co-guarantor with such manufacturer or supplier and shall furnish the Owner all appropriate guarantee or warranty certificates upon completion of the project. No guarantee period whether provided for in this article or elsewhere in this contract shall in any way limit the liability of the Contractor or his subcontractors, materialmen, suppliers, sureties or insurers for the full statutory periods provided by California law.

SECTION 6 PROSECUTION AND PROGRESS

6-1 CONTRACTOR'S LIABILITY

The Contractor shall be solely liable and responsible to the Owner for all acts and omissions of the Contractor's directors, officers, agents, owners, and employees and for all acts and omissions of all subcontractors, materialmen and suppliers and their respective directors, officers, managers, members, agents, owners and employees performing any of the work or providing any materials or supplies included as part of the work. The Owner, the Engineer/Architect and the Owner's Representative shall not be liable in any way for any acts or omissions of the Contractor, any subcontractors, any materialmen, any suppliers, or any of their respective directors, officers, managers, members, agents, employees or owners. Nothing contained in the Contract Documents shall create any contractual relationship between any subcontractor materialman, or supplier and the Owner. The Contractor shall bind all subcontractors to all terms of the Contract Documents for all work being performed by those subcontractors.

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor in dividing the work among subcontractors.

6-2 ASSIGNMENT

The performance of the contract may not be assigned, except upon the written consent of the Owner. Consent will not be given to any proposed assignment which would relieve the original Contractor or his sureties or insurers of their responsibilities under the contract, nor will the Owner consent to any assignment of a part of the work under the contract.

Upon obtaining a prior written consent of the Owner, the Contractor may assign moneys due or to become due him under the contract, to the extent permitted by law, but any assignment of moneys shall be subject to all proper setoffs in favor of the Owner and to all deductions provided for in the contract, and particularly all money withheld, whether assigned or not, shall be subject to being used by the Owner for the completion of the work in the event that the Contractor should be in default therein.

No assignment of this contract will be approved unless it shall contain a provision that the funds to be paid to the assignee under the assignment are subject to a prior lien for services rendered or materials supplied for performance of the work called for under the contract in favor of all persons, firms, or corporations rendering such services or supplying such materials and that the Owner may withhold funds due until all work required by the Contract Documents is completed to the Owner's satisfaction.

In the event of bankruptcy of the Contractor, whether voluntary or involuntary, this Agreement may be automatically terminated at the election of the Owner. The election to terminate in accordance with this provision shall be deemed effective as of the date the Owner mails notice of termination in accordance with this section to the Contractor at the Contractor's last known address without any further action of any party. Upon termination in accordance with this provision, the Contractor shall be entitled to no further payments over and above the reasonable value of the actual Work completed as of the date the termination notice is mailed.

6-3 CONTRACTOR'S CONSTRUCTION SCHEDULE AND COST BREAKDOWN

Within fourteen (14) days after Notice to Proceed, the Contractor shall deliver to the Owner's Representative a construction progress schedule and cost breakdown in bar chart form showing the proposed dates of commencement and completion and cost of each of the various parts of the work and the anticipated amount of each monthly payment that will become due the Contractor in accordance therewith. The Owner shall be entitled to terminate this Contract if, in the Owner's opinion, the Contractor is failing to carry on the work diligently or in accordance with the approved construction schedule and breakdown. The Contractor has been advised and understands that time is of the essence with respect to completion of all phases of the work in accordance with the approved construction schedule.

6-4 TIME FOR COMPLETION AND FORFEITURE DUE TO DELAY

The Contractor shall complete all or any designated portion of the work called for under the contract within the time set forth in Special Provisions Section 00810. Time is of the essence in this contract.

Failure of the Contractor to perform any covenant or condition contained in the Contract Documents within the time period specified shall constitute a material breach of this contract entitling the Owner to terminate the contract unless the Contractor applies for, and receives, an extension of time in accordance with the procedures set forth in this article and Article 6-5 EXTENSION OF TIME.

Failure of the Owner to insist upon the performance of any covenant or condition within the time period specified in the Contract Documents shall not constitute a waiver of the Contractor's duty to complete performance within the designated periods unless the waiver is in writing.

The Owner's agreement to waive a specific time provision or to extend the time for performance shall not constitute a waiver of any other time provisions contained in the Contract Documents. Failure of the Contractor to complete performance promptly within the additional time authorized in the waiver or extension of time agreement shall constitute a material breach of this contract entitling the Owner to terminate.

In accordance with Government Code 53069.85, Contractor agrees to forfeit and pay Owner the amount per day set forth in the Special Provisions for each and every day of delay which shall be deducted from any payments due or to become due the Contractor.

The Contractor shall not be deemed in breach of this contract and no forfeiture due to delay shall be made because of any delays in the completion of the work due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor provided the Contractor requests an extension of time in accordance with the procedures set forth in this article and Article 6-5 EXTENSION OF TIME. Unforeseeable causes of delay beyond the control of Contractor shall include acts of God, acts of a public enemy, acts of the government, acts of the Owner, or acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and weather, or delays of subcontractors due to such causes, or delays caused by failure of the Owner or the owner of a utility to provide for removal or relocation of existing utility facilities. Delays caused by actions or neglect of Contractor or his agents, servants, employees, officers, subcontractors, directors, or of any party contracting to perform part or all of the work or to supply any equipment or materials shall not be excusable delays. Excusable delays (those beyond Contractor's control) shall not entitle the Contractor to any additional compensation. The sole remedy of the Contractor shall be to seek an extension of time.

6-5 EXTENSION OF TIME

The Contractor shall not be entitled to any increase in the contract price as a result of the Owner's approval of any extension of time except to the extent that the Owner approves an increase in the contract price on a properly executed Change Order.

The time specified for completion of all of the work or any part of the work may be extended only by a written change order executed by the Owner or other written form executed by the Owner.

Requests for an extension of time must be delivered to the Owner's Representative within ten consecutive calendar days following the date of the occurrence which caused the delay. The request must be submitted in writing and must state the cause of the delay, the date of the occurrence causing the delay, and the amount of additional time requested. Requests for extensions of time shall be supported by all evidence reasonably available or known to the Contractor which would support the extension of time requested. Requests for extensions of time failing to include the information specified in this article and requests for extensions of time

which are not received within the time specified above shall result in the forfeiture of the Contractor's right to receive any extension of time requested.

If the Contractor is requesting an extension of time because of weather, he shall supply daily written reports to the Owner's Representative describing such weather and the work which could not be performed that day because of such weather or conditions resulting therefrom and which he otherwise would have performed.

The Owner's acceptance of the daily reports shall not be deemed an admission of the Contractor's right to receive an extension of time or a waiver of the Owner's right to strictly enforce the time provisions contained in the Contract Documents.

When the Contractor has submitted a request for an extension of time in accordance with the procedures of this article and Article 6-4 TIME FOR COMPLETION AND FORFEITURE DUE TO DELAY, the Owner will ascertain the facts and extent the delay and extend the time for completing the work if, in its judgment, the findings of fact justify such an extension, and its findings of facts thereon shall be final and conclusive. An extension of time may be granted by the Owner after the expiration of the time originally fixed in the contract or as previously extended, and the extension so granted shall be deemed to commence and be effective from the date of such expiration.

Any extension of time shall not release the sureties upon any bond required under the contract.

6-6 USE OF COMPLETED PORTIONS

When the work or any portion of it is sufficiently complete to be utilized or placed into service, the Owner shall have the right upon written notification to the Contractor to utilize such portions of the work and to place the operable portions into service and to operate same.

Upon said notice and commencement of utilization or operation by the Owner, the Contractor shall be relieved of the duty of maintaining the portions so utilized or placed into operation; provided, however, that nothing in this article shall be construed as relieving the Contractor of the full responsibility for completing the work in its entirety, for making good defective work and materials, for protecting the work from damage, and for being responsible for damage and for the work as set forth in the General Provisions and other Contract Documents nor shall such action by the Owner be deemed completion and acceptance, and such action shall not relieve the Contractor, his sureties, or insurers of the provisions of SECTION 8 CONTRACTOR'S INSURANCE, of Article 7-12 INDEMNITY, and of Article 5-14 TWO-YEAR GUARANTEE.

SECTION 7 LEGAL RELATIONS AND RESPONSIBILITIES

7-1 OBSERVING LAWS AND ORDINANCES

The Contractor shall keep himself fully informed of all existing and future laws, ordinances, and regulations which in any manner affect those engaged or employed to perform any of the work or providing any materials or supplies or which in any way affect the conduct of the work and of all statutes, laws, rules, regulations, orders, decisions, and decrees of any court or governmental agency having any jurisdiction or authority over all or any of the work or the conduct of the work,

including all federal, state and local safety rules, regulations, and orders. This shall expressly include all ordinances, rules, regulations, and requirements applying to the work or the conduct of the work enacted by the Owner. If any discrepancy or inconsistency is discovered in the Plans, Specifications, or contract for the work the relation to any such law, rule, regulation, ordinance, order or decree, the Contractor shall forthwith report the same to the Owner's Representative in writing and cease operations on that part of the work until the Owner's Representative has given him appropriate instructions as provided for Article 5-7 ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR.

The Contractor shall at all times observe and comply with and shall cause all of his directors, officers, agents, managers, members, owners, employees, subcontractors, materialmen and suppliers to observe and comply with all existing and future laws, ordinances, regulations, orders, and decrees, and shall hold harmless, indemnify, and defend the Owner, the Water Authority, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents from and against any and all liability, claims, causes of action, damages, losses, claim fees and costs, staff time, expenses, fees, and costs, including all costs of defense and attorneys' fees, arising from or based on the violation any such law, ordinance, regulation, order, or decree by the Contractor, any subcontractor, any materialman or supplier or any of their respective directors, officers, agents, managers, members, owners, or employees.

7-2 PERMITS AND LICENSES

The Contractor shall be solely liable and responsible for securing all permits and licenses necessary to perform all of the work, for paying all fees and charges necessary to secure any such permit, license, or approval, and for giving all notices which are appropriate or necessary to the proper and safe prosecution of the work. The Owner shall have no obligation to procure any permit, license, or approval necessary to perform all or any portion of the work. The Contractor shall also be solely liable and responsible for fully complying with all requirements of any permits, licenses or approvals pertaining to all or any of the work. The failure of Contractor to strictly comply with all requirements of any permits, licenses, or approvals applying to all or any of the work shall constitute a material breach of the contract.

7-3 INVENTIONS, PATENTS, AND COPYRIGHTS

The Contractor shall pay all royalties and assume all costs arising from the use of any invention, design, process, materials, equipment, product, or device which is the subject of patent rights or copyrights.

The Contractor shall hold harmless, indemnify, and defend the Owner, the Water Authority, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents from and against all claims, damages, losses, expenses, and other costs, including costs of defense and attorneys' fees, arising out of any infringement of patent rights or copyrights incident to the use in the performance of the work or resulting from the incorporation in the work of any invention, design, process, materials, equipment, product or device, and shall defend all such claims in connection with any alleged infringement of such rights.

7-4 PUBLIC CONVENIENCE AND SAFETY

The Contractor shall conduct his operations at all times in a manner that creates the least possible obstruction and inconvenience to the public, and he shall have under construction no greater length or amount of work than he can prosecute properly with due regard to the rights of the public and all property owners in the area of the work. The Contractor shall be solely liable and responsible for ensuring that all of the work is conducted at all times in a safe manner that does not injure or damage any workers, members of the public or private or public property.

Convenient access to driveways, houses, and buildings along the line of work shall be maintained and temporary crossings shall be provided and maintained in good condition at all times during performance of the work. Not more than one crossing or intersecting street or road shall be closed at any one time.

The Contractor shall provide and maintain such fences, barriers, directional signs, lights, and flagmen as are necessary to give adequate warning to the public at all times of any conditions to be encountered as a result of the work and to give directions to the public. The Contractor shall ensure that all unsafe conditions created by the work are promptly remedied and that any unsafe conditions created by the work are protected by barriers, safeguards and warnings preventing vehicular, bicycle or walking access in any unsafe areas.

It shall also be the sole responsibility of the Contractor to ensure that the work is performed at all times in a manner that does not injure or harm any person or injure or damage any real or personal property of any person or entity.

The Contractor shall perform the work only the areas expressly identified in the Contract Documents. The Contractor must operate entirely within the limits of the project site. No equipment or materials may be parked, stockpiled, or stored outside the project site or designated Contractor staging areas. The Contractor shall not enter onto, occupy, or disturb any privately owned land or any public or private habitat not scheduled for removal in the approved plans with any men, tools, materials, dirt, or equipment except with the prior express written consent of the Owner and all owners of any privately-owned land. The Contractor has been advised, and understands, that any request to enter onto, occupy, or disturb any privately-owned land or habitat must be submitted to the general manager of the Owner for written approval prior to entering onto, occupying, or disturbing any privately-owned land or public or private habitat for any purpose. The violation of this section by Contractor shall constitute a material breach of this contract.

The Contractor and any subcontractors, materialmen, or suppliers shall not, at any time, conduct any of the work in any manner that creates any public or private nuisance or trespass on the land of any private party or public agency. It shall be the sole responsibility of Contractor to conduct the work at all times in a manner that avoids creating any nuisance or trespass on any real or personal property owned by any private party or public agency.

The Contractor hereby agrees to indemnify, defend, and hold harmless the Owner, City of Encinitas, Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents from and against any and all liability, claims,

any and all liability, claims, causes of action, actions, damages, losses, fees, costs, or expenses, of whatever type or nature, including all costs of defense, attorneys' fees, and claim fees or costs, arising out of or resulting from performance of any of the work by the Contractor, its subcontractors, materialmen, or suppliers, or their respective directors, officers, agents, managers, members, owners, or employees which results in any injury or damage to persons or property including wrongful death regardless of whether or not such claim, cause of action, damage, loss or expense is caused in whole or in part by the negligence, active or passive, of Owner, the Engineer/Architect, or the Owner's Representative excepting only those claims and causes of action caused by the sole active negligence or intentional misconduct of the Owner, the Engineer/Architect, or the Owner's Representative. From and after the date of submission of any claim or demand to Owner, the indemnified parties shall recover from the Contractor all attorneys fees, expert fees and costs, claim costs, and staff time involved in handling the claim or any subsequent action on the claim at the standard hourly rates for staff handling the claim or action.

7-5 RESPONSIBILITY FOR LOSS, DAMAGE, OR INJURIES

The Contractor shall be solely responsible for all liability, claims, causes of action, demands, losses, costs, fees, expenses, and damages, of whatever type or nature, from any cause arising out of or resulting from or in connection with the performance of any of the work, excepting only those claims and causes of action caused solely and exclusively by the active negligence or intentional misconduct of the Owner, the Engineer/Architect, the Owner's Representative, or their consultants, directors, officers, employees, and agents. This exclusive responsibility shall extend to all liability, claims, causes of action, demands, losses, costs, fees, and expenses, of whatever type or nature, after completion of the work as well as during the progress of the work.

In the event any hazardous or toxic materials, including but not limited to asbestos, are utilized in construction or hazardous or toxic materials are otherwise encountered during construction, the Contractor shall take all appropriate precautions to protect persons and property and shall comply with all applicable regulations for the installation and handling of such hazardous or toxic materials. The Contractor is solely responsible for protection of all persons and property that could be affected by any construction or work and for the proper handling and disposal of all such hazardous or toxic materials.

Contractor has been advised that the Owner has Material Safety Sheets (hereinafter "MSS") available for review on any hazardous chemical they may be exposed to while working in or around Owner facilities. It shall be the sole responsibility of Contractor to request and inspect these MSS forms prior to commencement of any work and to alert all employees and agents of Contractor of potential hazardous waste exposure from Owner facilities. It shall be the sole responsibility of Contractor to provide the Owner's Representative with completed MSS forms for all hazardous or toxic substances that the Contractor utilizes as part of the work prior to the use of any hazardous or toxic substances and to provide these MSS forms to the Contractor's agents and employees prior to their exposure to any hazardous or toxic substance utilized by the Contractor. Further, Contractor shall comply with all provisions contained in General Industry Safety Orders Section 5194 of Title 8 of the California Administrative Code (the California Hazardous Communication Regulation) at all times during performance of the work.

7-6 CONTRACTOR'S RESPONSIBILITY FOR THE WORK

Until formal acceptance of the work by action of the Board of Directors of Owner, the Contractor shall be solely liable and responsible for all aspects of the work and all equipment materials and supplies to be provided as part of the work (including materials for which he has received partial payment or materials which have been furnished by the Owner) and shall bear the sole risk of injury, loss, or damage to any of the work, or any materials, supplies, or equipment being used or provided in conjunction with the work from any act of nature or the elements and from all other causes, whether arising from the execution or from the non-execution of the work.

The Contractor, at the Contractor's sole cost and expense, shall rebuild, repair, restore, and make good all injuries, losses, or damages whatsoever to any portion of the work or to any materials, equipment, or supplies from any cause before completion and formal acceptance of the work by formal action of the Board of Directors of Owner and shall solely bear the expense thereof. Where the Owner or the Owner's Representative determines it is necessary to protect the work or materials from any damage or injury, the Contractor shall at his sole expense provide suitable drainage and erect any additional structures and take all additional protective actions determined necessary or appropriate by either the Owner or the Owner's Representative to protect the work or materials from further damage or injury. The suspension of the work or the granting of an extension of time from any cause whatsoever shall not relieve the Contractor of his sole responsibility for the work, materials, or equipment as specified herein.

In an emergency affecting the safety of life or property, including any adjoining property, the Contractor, without special instructions or authorizations, shall promptly act to prevent such threatened loss or injury. The Contractor shall also promptly implement any and all directions given by the Owner or the Owner's Representative to protect the safety of life or property during any emergency as determined by Owner.

Notwithstanding the foregoing provisions of this section, the Contractor shall not be responsible for the cost of repairing or restoring damage to the work where the damage has been determined to have been caused solely by an Act of God in excess of 5% of the contract and amount provided that the work damaged is built in accordance with accepted and applicable building standards and in strict compliance with the Plans and Specifications. For the purpose of this paragraph, "Acts of God" shall include only earthquakes in excess of a magnitude of 3.5 on the Richter Scale and tidal waves. No other actions of the elements, nature, or man shall be treated as Acts of God under this paragraph.

7-7 PRESERVATION OF PROPERTY

The Contractor shall be solely liable and responsible for avoiding injury or damage or interfering with the construction or operation of any and all existing improvements or facilities, all utility facilities, all personal and real property whether owned by any public agency or private party, and any and all trees, shrubbery, landscaping and habitat that are not to be removed. The Contractor shall be solely liable and responsible for any and all damage and injury to any real or personal property of any person or entity both during and after performance of the work.

All trees, shrubbery, and landscaping that are not to be removed, and all lines, fences, signs, survey markers and monuments, buildings and structures, conduits, pipelines both under or above ground, all sewer and water pipelines or facilities, all highway or street facilities, and any and all other improvements, facilities, habitat, trees, or landscaping within or adjacent to the work not to be removed in the approved plans shall be protected by the Contractor from all injury or damage and the Contractor shall provide and install suitable safeguards to protect all such objects from any injury or damage. If any of the foregoing objects are injured or damaged either during or after performance of the work, they shall be promptly replaced or restored to a condition as good as when the Contractor commenced work or as good as required by the Plans and Specifications if any such objects or are part of the work being performed, at the Contractors sole cost and expense. The Owner, the Engineer/Architect and the Owners Representative and their respective Directors, officers, agents and employees shall have no liability whatsoever for any injury or damage caused in whole or in part by the actions or omissions of the Contractor, any subcontractor, any materialmen or supplier, or any of their respective directors, officers, agents, employees, managers, or members except where the injury or damage is caused by the sole and exclusive active negligence or intentional misconduct of the Owner, the Engineer/Architect, the Owners Representative, or their consultants, directors, officers, employees, and agents. The Contractor shall also be solely liable and responsible for any and all damage or injury to any landscaping or habitat caused in whole or in part by the actions or omissions of the Contractor, any subcontractor, any materialmen or supplier, or their respective directors, officers, agents, employees, managers, owners, or members.

The fact that any pipeline or other underground facility is not shown on the Plans, shall not relieve the Contractor of his responsibility under this section.

In addition to any requirements imposed by law, the Contractor shall shore up, brace, underpin, and protect all foundations, structures, or improvements adjacent to or adjoining the site of the work which are in any way affected by the excavations or by any of the work. Whenever any notice is required to be given by the Owner or the Contractor at any adjacent or adjoining landowner or other party before commencement of any work, this notice shall be given by the Contractor.

7-8 REGIONAL NOTIFICATION CENTER CONTACT

The Contractor, except in an emergency, shall contact the appropriate regional notification center prior to commencing any excavation work. Notify the center at least two working days in advance or up to a maximum of 14 calendar days in advance of any excavation work. The Contractor shall delineate the proposed excavation site with white paint on paved surfaces or with markings such as flags or stakes in unpaved areas. The Contractor shall provide the regional notification center with all job site location information. The regional notification center will assign to the Contractor a Dig Alert Number which validates the Contractor's excavation permit and will notify all of its members having subsurface installations in the area. No excavation shall be commenced and carried out by the Contractor until all existing subsurface installations have been field marked and the Owner has been given the Dig Alert Number by the Contractor.

Emergency shall be defined as a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life,

health, property, or essential public services. Emergency includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage (Government Code Section 4216).

Subsurface installation means any underground pipeline, conduit, duct, wire, or other structure operated or maintained in or across a public street or public right-of-way (Government Code Section 4216).

7-9 EXCAVATION PLANS FOR WORKER PROTECTION REQUIRED BY LABOR CODE SECTION 6705

If the total amount of the contract is in excess of \$25,000, the Contractor shall submit to the Owner for acceptance, in advance of excavation, a detailed Plans showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any trench or trenches 5 feet or more in depth. The Plans shall be prepared by a registered civil or structural engineer. As a part of the Plans, a note shall be included stating that the registered civil or structural engineer certifies that the Plans complies with all CAL-OSHA Construction Safety Orders and regulations, or that the registered civil or structural engineer certifies that the Plans is not less effective than the shoring, bracing, sloping, or other provisions of the Safety Orders and regulations.

The Owner or the Engineer/Architect or their consultants may have made investigations of subsurface conditions in areas where the work is to be performed. If so, these investigations are identified in the Special Provisions and the records of such investigations are available for inspection at the office of the Engineer/Architect. The detailed Plans showing the design of shoring, etc., which the Contractor is required to submit to the Owner for acceptance in advance of excavation will not be accepted by the Owner if the Plans are based on subsurface conditions which are more favorable than those revealed by the investigations made by the Owner or the Engineer/Architect or their consultants; nor will the Plans be accepted if it is based on soils-related design criteria which is less restrictive than the criteria set forth in the report on the aforesaid investigations of subsurface conditions.

The detailed Plans showing the design of shoring, etc., shall include surcharge loads for nearby embankments and structures, for spoil banks, and for construction equipment and other construction loadings.

The Plans shall indicate for all trench conditions the minimum horizontal distances from the side of the trench at its top to the near side of the surcharge loads.

Nothing contained in this article shall be construed as relieving the Contractor of the full responsibility for providing shoring, bracing, sloping, or other provisions which are adequate for worker protection.

7-10 SAFETY

In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons and property

during performance of the work, and the Contractor shall fully comply with all state, federal and other laws, rules, regulations, and orders relating to safety of the public and workers.

The right of the Engineer/Architect or the Owner's Representative to conduct construction review or observation of the Contractor's performance will not include review or observation of the adequacy of the Contractor's safety measures in, on, or near the construction site.

7-11 PERSONAL LIABILITY

No director, officer, employee, or agent of the Owner, the Engineer/Architect, the Owner's Representative, or their consultants shall be personally responsible for any liability arising under or by virtue of the contract.

7-12 DEFENSE AND INDEMNITY

The Contractor hereby agrees to indemnify, defend, and hold harmless the Owner, the Engineer/Architect, and the Owner's Representative and their respective directors, officers, agents, employees and consultants from and against any and all liability, claims, demands, causes of action, actions, damages, losses, fees, costs, or expenses, of whatever type or nature, including all costs of defense and attorneys' fees, caused in whole or in part, or claimed to be caused in whole or in part, by any act or omission of the Contractor, any subcontractor, any supplier or materialman or any of their respective directors, officers, agents, employees, managers, members, or owners except only those claims and causes of action caused by the sole active negligence or intentional misconduct of the Owner, the Engineer/Architect or the Owner's Representative or their respective agents or employees. This indemnification shall extend to all claims, demands, causes of action, actions, or liability occurring after completion of the project as well as during the progress of the Work.

The Contractor further agrees to indemnify, defend, and hold harmless the Owner, the Engineer/Architect, and Owner's Representative and their respective directors, officers, agents, employees, and consultants from and against any and all liability, claims, causes of action, actions, losses, fees, costs, expenses, or damages, of whatever type or nature, including all costs of defense and attorneys' fees, as a result of the failure of or claimed failure of the Contractor to strictly comply with any of the Contractor's obligations under this contract. This indemnity shall expressly include claims by the Owner for any injury, damages, losses, costs, fees or expenses arising from or related to the failure of the Contractor or any of his subcontractors, materialmen, or suppliers to strictly comply with all terms of this contract or as a result of any improper workmanship or defective supplies or materials.

The Contractor's indemnity obligations as contained in this section shall remain in full force and effect and shall apply whether or not the claim, cause of action, damage, cost, fee, or expense is covered by any applicable insurance policy and regardless of any position that may be taken by any insurance company regarding a defense or coverage for any claim or cause of action asserted. From and after the date any claim or demand is submitted to Owner covered by these indemnity provisions, the indemnified parties shall be entitled to recover from Contractor all fees and costs incurred in investigating the claim, all staff time involved in handling the claim or any subsequent action on the claim at staff's ordinary hourly rates, all expert fees and costs, all

attorneys' fees, and all court costs. The Contractor shall also be solely liable and responsible for paying any and all damages, fees or costs awarded to the claimant as a result of any settlement or final judgment of any cause of action or action covered by these indemnity provisions. This indemnity shall expressly include all wrongful death actions as well as any actions asserting any damage or injury to any persons or real or personal property.

From and after submission of any claim or demand to any of the indemnified parties, the indemnified party shall be entitled to appoint their own independent counsel to represent them and the Contractor shall pay all fees, costs, and expenses of whatever type or nature (including all staff time) incurred by each of the indemnified parties within thirty (30) consecutive days of receipt of a demand for reimbursement of these costs, fees, or expenses by each of the indemnified parties. A breach of this indemnity provision by Contractor shall constitute a material breach of the contract.

7-13 HOURS OF LABOR

The Contractor shall forfeit as a penalty to the Owner \$25 for each worker employed in the execution of the contract by the Contractor or any subcontractor under him for each calendar day during which such worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of the Labor Code and, in particular, Section 1810 to Section 1815 thereof, inclusive, except that work performed by employees of Contractors in excess of 8 hours per day and 40 hours during any one week shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than one and one-half times the basic rate of pay as provided in said Section 1815.

7-14 PREVAILING WAGE

The Contractor shall comply with Labor Code Section 1775. In accordance with said Section 1775, the Contractor shall forfeit as a penalty to the Owner \$50 for each calendar day or portion thereof for each worker paid less than the stipulated prevailing rates for such work or craft in which such worker is employed for any work done under the contract by him or her or by any subcontractor under him or her in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. In addition to said penalty and pursuant to said Section 1775, the difference between such stipulated prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor. Pursuant to Labor Code Section 1775, to the extent there is insufficient money due a contractor to cover all penalties forfeited and amounts due, the Division of Labor Standards Enforcement shall be notified of the violation and the Division of Labor Standards Enforcement shall be entitled to maintain an action in any court of competent jurisdiction to recover the penalties and the amounts due pursuant to Labor Code Section 1775.

Section 1776 of the Labor Code requires each contractor and its subcontractors to keep accurate payroll records showing the name, address, social security number, work classification, straight time, and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection

with the work required by these Contract Documents. These payroll records shall be made available for inspection or furnished to all employees, any representative of the Owner, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations. Contractor shall provide a certified copy of these payroll records to any of the aforementioned parties within 10 calendar days after receipt of a written request for these records. Contractor understands that it is the responsibility of the Contractor to ensure that these payroll records are maintained by Contractor and all subcontractors performing the work in accordance with Labor Code Section 1776(h). The payroll records shall be on forms provided by the Division of Labor Standard Enforcement or provide the same information as the information required by this form.

Pursuant to Labor Code Section 1777.1, whenever any contractor or subcontractor performing a public works project is found by the Labor Commissioner or the Owner to be in violation of Labor Code Section 1770 et seq., except Section 1775, the contractor or subcontractor or any firm, corporation, partnership, or association of which the contractor or any subcontractor has a substantial interest, shall be ineligible to bid on or to receive any public works contract for a period of not less than one-year or more than three years. The period of debarment shall run from the date the determination of the violation is made by the Labor Commissioner.

The Owner shall be entitled to withhold wages and penalties due as a result of any violation of the Labor Code from Payments due the Contractor in accordance with Labor Code Section 1726. These withheld amounts shall be paid to the Labor Commissioner for disbursement in accordance with Labor Code Section 1730. The Contractor's right to recover these wages and penalties shall be limited as provided in the Labor Code.

7-15 TRAVEL AND SUBSISTENCE PAYMENTS

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.

7-16 APPRENTICES

Attention is directed to the provisions in Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning the employment of apprentices by the Contractor or any subcontractor under him.

The Contractor and any subcontractor under him shall comply with the requirements of Sections 1777.5 and 1777.6 of the Labor Code in the employment of apprentices.

Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, ex officio the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.

Willful violations of Section 1777.5 will result in the Contractor, and the business entity under which the Contractor is doing business, being denied the right to bid on, or to receive, any public works contract for a period of up to one year for the first violation and for a period of up to three years for the second and subsequent violations commencing from the date the determination of

noncompliance by the Administrator of Apprenticeship Council. In addition, if the Contractor violates Section 1777.5, he will forfeit as a civil penalty the sum of \$50 for each calendar day of non-compliance which shall be withheld from progress payments by Owner upon notice from the Department of Industrial Relations. (Labor Code Section 1777.7.)

7-17 WARRANTY OF TITLE

No materials, supplies, or equipment for the work under this contract shall be purchased subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest therein or any part thereof is retained by the seller or supplier. The Contractor warrants clear and good title to all materials, supplies, and equipment installed and incorporated in the work and agrees upon completion of all work to deliver the premises together with all improvements and appurtenances constructed or placed thereon by him to the Owner free from any claims, liens, encumbrances, or charges and further agrees that neither he nor any person, firm, or corporation furnishing any material or labor for any work covered by the contract shall have any right to a lien upon the premises or any improvement or appurtenance thereon, provided that this shall not preclude the Contractor from installing metering devices or other equipment of utility companies or of municipalities, the title of which is commonly retained by the utility company or the municipality. Nothing contained in this article, however, shall defeat or impair the right of such persons furnishing materials or labor under any bond given by the Contractor for their protection or any right under any law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this article shall be inserted in all subcontracts and material contracts, and notices of its provision shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

7-18 PROPERTY RIGHTS IN MATERIALS

Nothing in the contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil. All such materials shall become the property of the Owner upon being so attached or affixed. Soil, stone, gravel, and other materials found at the site of the work and which conform to the Plans and Specifications for incorporation into the work may be used in the work. No other use shall be made of such materials except as may be otherwise described in the Plans and Specifications.

7-19 MUTUAL RESPONSIBILITY OF CONTRACTORS

Nothing in the contract shall be interpreted as granting to the Contractor exclusive occupancy of the site of the project. The Contractor must ascertain to his own satisfaction the scope of the project and the nature of any other contracts that have been or may be awarded by the Owner in the construction of the project, to the end that the Contractor may perform this contract in the light of such other contracts, if any.

The Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the project. If the performance of any contract for the project is likely to be interfered with by the simultaneous performance of some other contract or contracts, the Owner's Representative shall decide which contractor shall cease work temporarily and which contractor shall continue or whether the work under the contracts can be coordinated so that the contractors

contractors concerned and the Owner, the Engineer/Architect, the Owner's Representative, and their consultants shall not be responsible for any damages suffered or extra costs incurred by the Contractor resulting directly or indirectly from the award or performance or attempted performance of any other contract or contracts on the project or caused by a decision or omission of the Owner's Representative respecting the order of precedence in the performance of the contracts.

If through acts of neglect on the part of the Contractor, any other contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration, if such other contractor or subcontractor will so settle. If such other contractor or subcontractor shall assert any claim against the Owner, the Engineer/Architect, the Owner's Representative, or their consultants or any of their directors, officers, employees, or agents on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor who shall hold harmless, indemnify, and defend the Owner, City of Encinitas, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents against any such claim, including all attorneys' fees and any other costs incurred by the indemnified parties relative to any such claim.

7-20 TERMINATION FOR BREACH

If the Contractor refuses or fails to prosecute the work or any separable part thereof with such diligence as will ensure its completion within the time specified herein, or any extension thereof, or fails to complete such work within such time, or if the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he files a petition to take advantage of any debtor's act, or if he or any of his subcontractors should violate any of the provisions of the contract, or if he should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials to complete the work in the time specified, or if he should fail to make prompt payment to subcontractors or for material or labor, or if he should persistently disregard laws, ordinances, or instructions given by the Owner or Owner's Representative, the Owner may, without prejudice to any other right or remedy, serve written notice upon the Contractor and his surety of his intention to terminate the contract, said notice to contain the reasons for such intention to terminate the contract, and unless within ten days after the service of such notice such violations shall cease and satisfactory arrangements for the corrections thereof be made, the contract shall upon the expiration of said ten days cease and terminate. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished.

In the event of any such termination, the Owner shall immediately serve written notice thereof upon the surety and the Contractor, and the surety shall have the right to take over and perform the contract; provided, however, that if the surety within 15 calendar days after the serving upon it of a notice of termination does not give the Owner written notice of its intention to take over and perform the contract or does not commence performance thereof within 30 calendar days from the date of serving said notice, the Owner may take over the work and prosecute the same to completion by contract or by any other method it may deem advisable for the account and at the expense of the Contractor, and his surety shall be liable to the Owner for any excess cost or

to completion by contract or by any other method it may deem advisable for the account and at the expense of the Contractor, and his surety shall be liable to the Owner for any excess cost or other damage occasioned the Owner thereby, and in such event the Owner may, without liability for so

doing, take possession of and utilize in completing the work such materials, appliances, plants, and other property belonging to the Contractor that may be on the site of the work and be necessary therefor. For any portion of such work that the Owner elects to complete by furnishing its own employees, materials, tools, and equipment, the Owner shall be compensated for such in accordance with the schedule of compensation for force account work in Article 9-1 PAYMENT FOR CHANGES IN THE WORK.

If the unpaid balance of the contract price exceeds the direct and indirect costs of completing the work, including, but not limited to, all costs to Owner arising from professional services and

attorneys' fees and all costs generated to insure or bond the work of substituted contractors or subcontractors utilized to complete the work, such excess shall be paid to Contractor. If such costs exceed the unpaid balance, Contractor shall pay the difference to Owner promptly upon demand; on failure of Contractor to pay, the surety shall pay on demand by Owner. Any portion of such difference not paid by Contractor or surety within 30 calendar days following the mailing of a demand for such costs by Owner shall earn interest at the rate of 10% per annum or the maximum rate authorized by California law, whichever is lower.

The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the Owner.

7-21 NOTICE AND SERVICE THEREOF

Any notice required or given under the contract shall be in writing, be dated, and signed by the party giving such notice or his duly authorized representative, and be served as follows:

If to the Owner, by personal delivery or by deposit in the United States mail.

If to the Contractor, by personal delivery to the Contractor or to his authorized representative at the site of the project or by deposit in the United States mail.

If to the surety or any other person, by personal delivery to said surety or other person or by deposit in the United States mail.

All mailed notices shall be in sealed envelopes, shall be sent by certified mail with postage prepaid, and shall be addressed to the addresses in the Contract Documents or such substitute addresses which a party designates in writing and serves as set forth herein.

7-22 PARTIAL INVALIDITY

If any provision of this contract is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions shall nevertheless continue in full force without being impaired or invalidated in any way.

7-23 ATTORNEYS' FEES

In the event any arbitration proceeding, administrative proceeding or litigation in law or in equity, including an action for declaratory relief, is brought to invalidate, enforce, or interpret any term or provision of this contract, the prevailing party shall recover all attorneys' fees, all expert fees and costs, and all costs of the proceeding which shall be determined by the Court or the presiding officer at the proceeding authorized to make a determination of the issues or in a separate action brought for that purpose, in addition to any other relief provided by California law.

If any party to this agreement becomes a party to any litigation, administrative proceeding or arbitration concerning the invalidation, enforcement or interpretation of the provisions of this agreement or the performance of this agreement by reason of any act or omission of another party or authorized representative of another party to this agreement and not by any act or omission of a party that becomes a party to that proceeding or any act or omission of its authorized representatives, the party that causes another party to become involved in the proceeding shall be liable to that party for all expert fees and costs, all attorneys' fees, and all costs of the proceeding. The award of these expert fees and costs, attorneys' fees, and costs shall be determined as provided above.

From and after any date of submission of any demand or claim to Owner or any of the other indemnified parties covered by any indemnity provisions of this contract, the indemnified party shall be entitled to appoint their own independent counsel to represent them and the Contractor shall pay all fees and costs incurred by the indemnified parties to investigate and evaluate the claim or cause of action, for all staff time at the hourly rates of each staff member handling the claim or cause of action, all attorneys' fees, all expert fees and costs, and all court costs when and as these fees and costs are incurred by each of the indemnified parties. The Contractor agrees to pay all of these fees, costs, and expenses to each of the indemnified parties not later than thirty (30) days following a demand for reimbursement of these fees, costs, and expenses by each of the indemnified parties. Amounts not paid by the Contractor within this thirty (30) day period shall earn interest at the rate of one percent (1%) per month until paid by Contractor in full.

In the event opposing parties have each prevailed on one or more cause of action actually contested or admitted by pleadings or pre-hearing documents on file, the presiding officer may offset such fees and costs between prevailing parties after considering the necessity of the proceeding and the importance of the issue or issues upon which a party has prevailed. However, the court or presiding officer shall have no authority to relieve the Contractor of the Contractor's obligation to pay all damages, fees, costs, and expenses of each of the indemnified parties as provided in the indemnity provisions of this contract.

The term "prevail" as used in this section shall include any action at law, in equity, or pursuant to arbitration in which either party has been successful including, but not limited to, demurrers, motions to strike, judgments on the pleadings, summary judgments or summary adjudications of issues, any other motion of whatever type or nature, or any trial proceeding or motion.

7-24 LANDS AND RIGHTS-OF-WAY

The lands and rights-of-way for the facility to be constructed will be provided by the Owner. The Contractor shall make his own arrangements and pay all expenses for additional area required by him outside the limits of the Owner's lands and rights-of-way.

Work in public right-of-way shall be done in accordance with the requirements of the permit issued by the public agency in whose right-of-way the work is located in addition to conforming to the Plans and Specifications. If a permit is not required, the work shall conform to the standards of the public agency involved in addition to conforming to the Plans and Specifications.

7-25 NO WAIVER OF RIGHTS OR REMEDIES

No action or failure to act by the Owner, Engineer/Architect, or Owner's Representative shall constitute a waiver of any right or duty afforded any of them under the Contract Documents, nor shall any such action or failure to act constitute an approval of or acquiescence in a breach of this contract by Contractor. No oral waiver of any rights or remedies granted to the Owner, Engineer/Architect, or Owner's Representative shall be effective for any purpose. To be effective, the waiver must be in writing and executed by an authorized representative of Owner, the Engineer/Architect, or the Owner's Representative. Contractor has been informed, and understands, that the Engineer/Architect and Owner's Representative have no authority whatsoever to waive any rights or remedies granted to the Owner by this contract or to alter any term or provision of the Contracts Documents or the approved Plans and Specifications. Any such purported waiver shall be void and unenforceable.

7-26 TAXES

The Contractor shall pay all sales, consumer, use, and other taxes.

NOTICE OF TAXABLE POSSESSORY INTEREST - The terms of this document may result in the creation of a possessory interest. If such a possessory interest is vested in a private party to this document, the private party may be subjected to the payment of personal property taxes levied on such interest.

7-27 ASSIGNMENT OF ANTI-TRUST ACTIONS

In entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the

bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

Contractor shall insure that a comparable provision is included in all subcontracts at all tier levels which are executed pursuant to this Agreement.

7-28 PAYROLL RECORDS

It shall be the responsibility of the Contractor to maintain an accurate payroll record showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each employee in accordance with Labor Code Section 1776, and to ensure that each subcontractor also complies with all provisions of Labor Code Section 1776 and this contract provision.

All payroll records shall be certified as accurate by the applicable contractor or subcontractor or its agent having authority over such matters.

The Contractor shall ensure that all payroll records are available for inspection at the Contractor's principal office during normal business hours and shall notify the Owner, in writing, of the place where all payroll records are located from time to time.

The Contractor shall furnish a copy of all payroll records, upon request, to employees or their authorized agents, to the Owner, to the Division of Labor Standards Enforcement, and to the Division of Apprenticeship Standards of the Department of Industrial Relations. The Contractor shall also furnish a copy of payroll records to the general public upon request provided the public request is made through the Owner, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement of the Department of Industrial Relations. In no event shall members of the general public be given access to payroll records at the Contractor's principal office.

Records made available to the general public in accordance with the prior paragraph shall be marked or obliterated in such a manner that the name and address of the Contractor and/or subcontractor and the name, address, and telephone number of all employees does not appear on the modified record.

The Contractor shall file a certified copy of any requested payroll records with the entity that requested such records within ten days of the date a written request for payroll records has been received.

Failure of the Contractor to comply with any provisions of this article or Labor Code Section 1776 within ten days of the date of a written request for compliance is received shall result in a forfeiture of up to \$50 per calendar day or portion thereof, for each worker, until strict compliance is obtained. Upon notification by the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement of the Department of Industrial Relations, the Owner shall withhold penalties under this article or Labor Code Section 1776 from the Contractor's payments then due.

7-29 MODIFICATION

This contract may not be altered in whole or in part except by modification in writing and properly executed by all parties hereto or by change as provided herein.

7-30 JURISDICTION AND VENUE

In the event any legal or equitable proceeding is commenced to invalidate, enforce, or interpret any of the terms or provisions of this contract, the parties expressly agree that jurisdiction and venue shall lie only in the Superior Court located in the North County Judicial District, County of San Diego, State of California. The Contractor acknowledges and agrees that this contract has been executed and requires performance solely within the jurisdiction and venue of the North County Judicial District and that the contract requires work solely within the jurisdiction and venue of the North County Judicial District.

7-31 HAZARDOUS WASTE

It shall be the responsibility of the Contractor to pay all fees and costs associated with removal and cleanup of any hazardous waste used at or brought to the job site by the Contractor, any subcontractor, or any agent, representative, or employee of the Contractor or any subcontractor.

The Contractor shall identify and remove all such hazardous waste in accordance with all federal, state, and local rules and regulations and shall promptly notify the Owner's Representative of any such hazardous waste. If hazardous waste is discovered during performance of the work which has not been brought to, or used at, the job site by the Contractor, any subcontractor, or any agent, representative, or employee of the Contractor or any subcontractor, the Contractor shall identify and remove this hazardous waste in accordance with all federal, state, and local rules and regulations and in accordance with directions of the Owner and the Contractor shall be entitled to request an increase in compensation due for these removal and cleanup costs in accordance with Article 9-1 PAYMENT FOR CHANGES IN THE WORK.

7-32 EXCAVATIONS BELOW FOUR (4) FEET

If any work required by this contract includes digging trenches or other excavations that extend deeper than four feet below the surface, the Contractor shall promptly, and before the following conditions are disturbed, notify the Owner in writing of any:

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 the provisions of existing law.

Subsurface or latent physical conditions at the site differing from those indicated.

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.

Nothing in this article is intended to relieve the Contractor of his responsibility to carefully examine the Contract Documents and the site where the work is to be performed in accordance with Article 2-8 EXISTING CONDITIONS AND EXAMINATION OF CONTRACT DOCUMENTS;

to familiarize himself with all local conditions and federal, state, and local laws, ordinances, rules, and regulations that may affect the performance of any work; to study all surveys and investigation reports about subsurface and latent physical conditions pertaining to the job site; to perform such additional surveys and investigations as the Contractor deems necessary to complete the work at his bid price; and to correlate the results of all such data with the requirements of the Contract Documents.

If the Owner determines that hazardous waste exists and that conditions exist which Contractor could not discover through the investigations required by the preceding paragraph, the Owner shall notify the Contractor and the Contractor may request a change order in accordance with Article 9-1 PAYMENT FOR CHANGES IN THE WORK. Nothing in this article shall relieve the Contractor of the obligation to pay all fees and costs associated with removal and cleanup of any hazardous waste used at, or brought to, the job site by the Contractor as specified in Article 7-31 HAZARDOUS WASTE. Nor shall this article relieve the Contractor of responsibility for site conditions discoverable by any investigation required by the preceding paragraph.

In the event that a dispute arises between the Owner and the Contractor involving hazardous waste and whether site conditions differ materially from those the Contractor could or should have discovered by the investigations required by this contract, the Contractor shall not be excused from the scheduled completion date provided in the Contract Documents and shall proceed with all work in the manner and in the time required by the Contract Documents.

7-33 ARBITRATION

All public works claims between the Contractor and Owner relating to this contract where the total claims of both parties are equal to or less than \$375,000 shall be submitted to mediation first and then to arbitration in accordance with Public Contract Code Section 20104, et seq. A copy of Public Contract Code Section 20104, et seq stating these arbitration requirements is attached following the General Provisions. When a total payment of the Contractor and the Owner exceed a total of \$375,000, this section shall not apply and neither the Owner nor the Contractor shall have any obligation to arbitrate the claim.

SECTION 8 CONTRACTOR'S INSURANCE

8-1 GENERAL

The Contractor shall not commence or continue to perform any work unless he, at his own expense, has in full force and effect all required insurance. The Contractor shall not permit any subcontractor to perform work on this project unless the Workers' Compensation Insurance requirements have been complied with by such subcontractor.

The types of insurance the Contractor shall obtain and maintain are Workers' Compensation Insurance and Employer's Liability Insurance, Liability Insurance, Builders' Risk "All Risk" Insurance, all as set forth herein.

Workers' Compensation Insurance and Employer's Liability Insurance and Liability Insurance shall be maintained in effect for the full guarantee period.

Insurers must be authorized to do business and have an agent for service of process in California, have an "A" policyholder's rating and a financial rating of at least Class VI in accordance with the most current rating by A.M. Best Company.

As evidence of specified insurance coverage, the Contractor shall provide certificates of insurance and endorsements on the forms provided as a part of the Contract Documents. No alteration or substitution of said forms will be allowed.

8-2 WORKERS' COMPENSATION INSURANCE AND EMPLOYER'S LIABILITY INSURANCE

Upon execution of the Agreement, the Contractor shall provide a Certificate(s) of Insurance certifying that he has obtained for the period of the contract full Workers' Compensation Insurance coverage for no less than the statutory limits and Employer's Liability Insurance coverage in limits not less than the amounts set forth in the Special Provisions, for all persons whom he employs or may employ in carrying out the work under the contract. At the same time, the Contractor shall provide the Insurance Endorsement(s) on the forms provided as part of the Contract Documents. This insurance shall be in strict accordance with the requirements of the most current and applicable state Workers' Compensation Insurance laws.

8-3 LIABILITY INSURANCE

Upon execution of the Agreement, the Contractor shall provide a Certificate(s) of Insurance showing that he has Liability Insurance coverage in limits not less than the amounts set forth in the Special Provisions. At the same time, the Contractor shall provide the Insurance Endorsement(s) on the forms provided as part of the Contract Documents.

All liability insurance shall include occurrence coverage with a deductible amount not exceeding the amount specified on the liability certificate form.

Included in such insurance shall be a "Cross Liability" or "Severability of Interest" clause.

The Liability Insurance coverage shall include each of the following types of insurance:

- A. General Liability
 - (1) Comprehensive Form.
 - (2) Premises-Operations.
 - (3) Explosion and Collapse Hazard.
 - (4) Underground Hazard.
 - (5) Products/Completed Operations Hazard.
 - (6) Contractual Insurance.
 - (7) Broad Form Property Damage Including Completed Operations.

(8) Independent Contractors.

(9) Personal Injury.

B. Automobile Liability

(1) Comprehensive Form Including Loading and Unloading.

(2) Owned.

(3) Hired.

(4) Non-Owned.

The Liability Insurance shall include as additional insureds: the Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents. The insurance afforded to these additional insureds shall be primary insurance. If the additional insureds have other insurance which might be applicable to any loss, the amount of the insurance provided under this article on LIABILITY INSURANCE shall not be reduced or prorated by the existence of such other insurance.

8-4 BUILDERS' RISK "ALL RISK" INSURANCE

Upon execution of the Agreement, the Contractor shall provide a Certificate(s) of Insurance showing that he has obtained for the period of the contract Builders' Risk "All Risk" completed value insurance coverage (including any damage attributable directly or indirectly to surface water, runoff, rainfall or flood but excluding earthquake and tidal wave) upon the entire project which is the subject of the contract and including completed work and work in progress. At the same time, the Contractor shall provide the Insurance Endorsement(s) on the forms provided as a part of the Contract Documents. Such insurance shall include as additional insureds: the Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents.

Such insurance may have a deductible clause but not to exceed \$25,000.

8-5 CONTRACTOR'S LIABILITY NOT LIMITED BY INSURANCE

Nothing contained in these insurance requirements is to be construed as limiting the liability of the Contractor or the right of the Owner to secure damages in excess of any insurance which may be provided.

SECTION 9 ESTIMATES AND PAYMENTS

9-1 PAYMENT FOR CHANGES IN THE WORK

The Contractor shall not be entitled to any increase in the contract price due to any change in the work unless the Contractor submits a written request within seven calendar days from the date of the event which causes the Contractor to request a change in the price.

Changes in, additions to, or deductions from the work, including increases or decreases in the quantity of any item or portion of the work, shall be set forth in a written change order executed by the Owner and by the Contractor which shall specify:

The changes, additions, and deductions to be made.

The increase or decrease in compensation due the Contractor, if any.

Adjustment in the time of completion, if any.

Adjustment in the compensation due the Contractor shall be determined by one or more of the following methods in the order of precedence listed below:

Unit price contained in the contract.

Mutually agreeable lump sum or unit prices. If requested by the Owner's Representative, the Contractor shall furnish an itemized breakdown of the quantities and prices used in computing proposed lump sum and unit prices.

Force account whereby the Contractor is compensated for furnishing labor, materials, tools, and equipment as follows:

Cost of labor plus 15% for workers directly engaged in the performance of the work. Cost of labor shall include actual wages paid including employer payments to or on behalf of the workers for health and welfare, pension, vacation, and similar purposes plus payments imposed on payroll amounts by state and federal laws plus subsistence and travel allowance payments to workers.

Cost of material plus 15%. Cost of material shall include sales tax, freight, and delivery charges. The Owner reserves the right to furnish such materials as he deems advisable and the Contractor shall not be paid the 15% markup on such materials.

For tools and equipment actually engaged in the performance of the work, rental rates plus 15%. The rental rates shall be those prevailing in the area where the work is performed. No rental charge shall be made for the use of tools or equipment having a replacement value of \$500 or less.

Subcontractor invoices to the Contractor plus 5%. Subcontractor invoices shall be based on the above-described cost of labor plus 15%, cost of material plus 15%, and tool and equipment rental rates plus 15%.

No payment shall be made for any item not set forth above, including without limitation, Contractor's overhead, general administrative expense, supervision, or damages claimed for delay in prosecuting the remainder of the work.

For force account work, the Contractor shall submit to the Owner's Representative for his verification, daily work sheets showing an itemized breakdown of labor, materials, tools, and

equipment used in performing the work. No payment will be made for work not verified by the Owner's Representative.

9-2 PROGRESS PAYMENTS

The Contractor shall, on or before the third day of each calendar month after actual construction work is started, prepare the Progress Estimate and Payment Form included at the end of the General Provisions. The Contractor and the Owner's Representative shall review each work item and agree on the total value of work performed during the previous month. In the event the Contractor and the Owner's Representative cannot agree on the estimated total value of work during the previous month, the estimated total value of work performed as determined by the Owner's Representative during the previous month shall be used. No progress payment will be processed by the Owner until all information required by the Progress Estimate and Payment Form has been completed and the Contractor has signed the form. By signing the Progress Estimate and Payment Form, the Contractor expressly waives and releases any claims the Contractor may have, of whatever type or nature, for the period specified which is not shown as a retention amount or a disputed claim on the Release Form included at the end of the General Provisions. The Contractor shall submit to the Owner's Representative a completed and signed Conditional Waiver and Release Form that corresponds to the same pay estimate work period. The Owner shall have no obligation to pay the Contractor for any work done until the Conditional Waiver and Release Form has been executed by the Contractor and submitted to the Owner's Representative for the corresponding pay period in accordance with Article 9-6 REQUIRED RELEASES.

As a prerequisite for payment, the Contractor shall submit monthly updates to the construction schedule and as-builts to the Owner's Representative for approval.

Properly submitted Progress Estimate and Payment Form with corresponding Conditional Waiver and Release Form shall be paid by the Owner within thirty days after receipt. Properly submitted forms not paid within this thirty-day period shall earn interest at the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure. The Contractor and Owner agree that the thirty-day period for payment shall not commence until the Contractor has executed and submitted the Release Form to the Owner for the corresponding pay period.

In preparing any progress payment with the Contractor, the Owner's Representative will use the cost breakdown in by Article 6-3 CONTRACTOR'S CONSTRUCTION SCHEDULE AND COST BREAKDOWN. No allowance shall be made for materials delivered but not installed. In evaluating any progress payment, the Owner's Representative may take into consideration any facts and conditions deemed proper by him or her in his or her sole discretion including, but not limited to, the ratio of the difficulty or cost of the work done to the probable difficulty or cost of the work remaining to be done under the contract, the value of the work actually completed, and the estimated cost to complete all of the work in accordance with the contract price. In the event of any dispute between the Owner and the Contractor on the amount that should be paid for any progress payment, the determination of the Owner or the Owner's Representative shall control and be binding on the Contractor. No dispute between the Contractor and the Owner concerning the amount to be paid for any progress payment shall relieve the Contractor of its continuing obligation to complete all contract work within the time required by the Contract Documents, and

to complete the work for the contract price and shall not relieve the Contractor of any other obligations contained in the Contract Documents. Owner shall retain five percent (5%) of each progress payment approved by the Owner's Representative as part security for the fulfillment of the contract by Contractor, unless Contractor has substituted adequate equivalent securities as required by Article 9-5 WITHHELD CONTRACT FUNDS. The total amount retained will equal 5% of the contract price. In the event of a dispute between the Owner and Contractor, the Owner shall have the right to withhold an amount up to 150% of the disputed amount in accordance with Public Contract Code Section 7107(c). As part of any progress payment the Owner shall have the express right to deduct and withhold from any payments due the Contractor any amounts the Owner or the Owner's Representative determines are necessary or appropriate to cover all fees, costs, expenses, and damages incurred or estimated by the Owner as a result of any breach of this contract by the Contractor and to cover any and all damages suffered or estimated by the Owner as a result of the breach of any term or provision of the contract by the Contractor. Amounts the Owner may withhold also expressly include any and all liquidated damages authorized by the terms of this contract.

9-3 FINAL ESTIMATE AND PAYMENT

Contractor shall not make any request for the final payment until all work required by the Plans and Specifications of the Contract Documents has been completed to the satisfaction of the Owner's Representative. Upon receipt of a request from Contractor for final payment, the Owner's Representative will make a final inspection of the work done and advise the Contractor of additional work required before final payment will be processed. All prior progress estimates and payments shall be subject to correction in the final estimate and payment.

As a prerequisite for final payment, the Contractor shall submit final as-builts to the Owner's Representative for approval.

The final payment shall not be due and payable until 60 calendar days after the date of filing a Notice of Completion of the accepted work. The date of completion shall be determined in accordance with Public Contract Code Section 7107. In the event of a dispute between the Owner and the Contractor, Owner shall be entitled to withhold an amount up to 150% of the disputed amount.

It is mutually agreed between the parties to the contract that no certificate given or payment made under this contract shall constitute evidence of performance of the contract and no payment by Owner shall be construed as an acceptance of any defective work or improper materials.

Contractor shall not be entitled to payment of the final amount due until Contractor has executed a Release Form in accordance with Article 9-6 REQUIRED RELEASES. Contractor hereby expressly agrees that payment of the final amount due under the contract shall release the Owner, the Engineer/Architect, the Owner's Representative, and their consultants, and each of their directors, officers, employees, and agents, from any and all claims relating to the work for which Contractor is being paid. It is the declared intention of the parties that this provision comply with Public Contract Code Section 7100 and that this section shall be construed as in compliance with Public Contract Code Section 7100 to the maximum feasible extent.

9-4 OWNER'S RIGHT TO WITHHOLD CERTAIN AMOUNTS AND MAKE APPLICATION THEREOF

In addition to the amounts which the Owner may retain under Sections 9-2 and 9-3 of this contract, the Owner may withhold a sufficient amount or amounts from any payment otherwise due to the Contractor (including any final payment) as may be necessary or appropriate in Owner's sole and exclusive judgment to cover each of the following:

Payments which are or may be past due and payable for properly filed claims against the Contractor or any subcontractors for any labor, materials, or equipment furnished in or about the performance of the work on the project under this contract including any amounts asserted as attorneys' fees, costs, or interest by the claimant.

All fees, costs, and expenses estimated by the Owner for correcting any work determined to be defective by the Owner.

Any amounts determined appropriate or necessary by the Owner to cover the Owner's estimate of any damages paid or payable as a result of any claim or cause of action on the contract caused, or claimed to be caused by any action or omission of Contractor, any subcontractor, supplier or materialmen or their respective directors, officers, agents, employees, members, managers or consultants and all fees, costs, and expenses, including all attorneys' fees, expert fees and costs, staff time at each staff members' normal hourly rates and all court costs estimated by the Owner in responding to the claim or cause of action.

Any amounts determined necessary or appropriate by Owner to cover all of the indemnity obligations of Contractor under this contract.

Any amounts claimed by the Owner as forfeiture due to delay and any and all other amounts, fees, costs, or expenses estimated by the Owner as offsets.

The Owner has the express authority to withhold any amount or amounts determined appropriate by Owner from time to time from any payments otherwise due Contractor to cover all or any of the preceding items in the Owner's sole and exclusive judgment. The Owner may also apply all or any portion of any such withheld amount or amounts to the payment of any claims in such amounts and at such times as are determined appropriate by Owner, in Owner's discretion. In withholding any sums permitted by this section or in paying any claims, the Owner shall be deemed the agent of the Contractor and any payments made by the Owner on any claim shall be considered as a payment made under the contract by the Owner to the Contractor. The Owner shall not be liable to the Contractor for Owner's withholding of any and all amounts permitted by this section or Owner's payment of any claims as permitted by this section. Such withholdings and payments may be made by Owner at any time without prior judicial determination of the merits of any claims or causes of action. The Owner will render to the Contractor a proper account of any funds withheld or disbursed as permitted by this section.

9-5 WITHHELD CONTRACT FUNDS

Pursuant to Public Contract Code Section 22300, the Contractor may substitute equivalent securities for retention amounts which this Contract requires. However, the Owner reserves the right to solely determine the adequacy of the securities being proposed by the Contractor and the value of those securities. The Owner shall also be entitled to charge an administrative fee, as determined by Owner in its sole discretion, for substituting equivalent securities for retention amounts.

The Contractor agrees that the Owner's decision with respect to the administration of the provisions of Section 22300 shall be final and binding and not subject to subsequent litigation or arbitration of any kind as to acceptance of any securities being proposed, the value of these securities, the costs of administration and the determination of whether or not the administration should be accomplished by an independent agency or by the Owner. The Owner shall be entitled, at any time, to request the deposit of additional securities of a value designated by the Owner, in Owner's sole discretion, to satisfy this requirement. If the Owner does not receive satisfactory securities within 12 calendar days of the date of the written request, Owner shall be entitled to withhold amounts due Contractor until securities of satisfactory value to Owner have been received.

9-6 REQUIRED RELEASES

In accordance with Public Contract Code Section 7100, the Contractor shall not be entitled to any payment specified in this Contract which is undisputed until such time as the Contractor has executed the Release Form(s) included at the end of the General Provisions releasing the Owner from all claims relating to work for which the Contractor is being paid. The Release Form contains space for the Contractor to claim any disputed amount and to designate the retention amount for each pay period associated with the release. Contractor hereby expressly agrees that failure on his part to designate any disputed amount or to designate the correct retention amount for each release period on the Release Form shall constitute an express waiver of the right of the Contractor to claim any disputed amount or any retention amount at any later date. The Owner shall have no obligation to pay the Contractor for any work done until the Release Form at the end of the General Provisions has been executed by the Contractor and submitted to the Owner.

9-7 AB 626

State of California Assembly Bill 626 (AB 626) establishes, for contracts entered into on or after January 1, 2017, a claims resolution process that must be applied to any and all claims by contractors in connection with a public works project. AB 626 also creates a process whereby a subcontractor, who may lack legal standing to assert a claim against a public entity, may make a claim through the contractor.

A claim is defined as a separate demand by the contractor for one or more of the following: (i) a time extension for relief from damages or penalties for delay, (ii) payment of money or damages arising from work done pursuant to the contract for a public work, or (iii) payment of an amount disputed by the public entity, as specified.

AB 626 requires a public entity, upon receipt of a claim sent by registered or certified mail, to conduct a reasonable review, within 45 days, provide a written statement identifying the disputed

and undisputed portions of the claim. The 45-day period may be extended by mutual agreement or, until after the next meeting of the governing body of the public entity, if the governing body must approve the disputed and undisputed portions of the claim. The Bill also requires any payment due on the undisputed portion of the claim to be processed within 60 days.

If the claimant disputes the public entity's written response or if the public entity fails to respond to a claim within the time prescribed, the claimant must demand, in writing, a meet and confer for settlement of the issues in dispute. The public entity must then schedule a meet and confer conference within 30 days for settlement of the dispute. AB 626 requires any disputed portion of the claim that remains in dispute after the meet and confer conference to be subject to nonbinding mediation, as specified. The public entity can also require arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if the mediation does not resolve the dispute.

If the public entity fails to respond to a claim from a contractor within the time periods prescribed in AB 626, the claim is deemed rejected in its entirety and alternate dispute resolution processes may be pursued. AB 626 provides that unpaid claim amounts which are not paid in a timely manner shall accrue interest at 7% per annum.

SECTION 10 AUTHORITY AND STATUS OF OWNERS REPRESENTATIVES

10-1 STATUS OF OWNERS REPRESENTATIVES

The Contractor has been informed, and understands, that the Engineer/Architect and the Owner's Representative are not agents or employees of Owner. They are independent contractors retained by Owner to assist in preparation of the design plans for the work and in supervising the work to be performed by the Contractor. Owner does not direct the Engineer/Architect or the Owner's Representative in the performance of their respective duties and obligations. Owner shall not be liable for any errors or omissions of the Engineer/Architect, the Owners Representative or their respective directors, officers, agents or employees.

10-2 AUTHORITY OF OWNER'S REPRESENTATIVES

Contractor has been informed, and understands, that the Engineer/Architect and the Owner's Representative have no authority to alter any of the terms or provisions of the Contract Documents

or to alter any of the requirements contained in the plans and specifications approved by Owner. In the event that Contractor desires to modify any term or provision of the Contract Documents or to modify any of the requirements of the approved plans and specifications, a written request must be submitted with the requested changes to the Owner through the Owner's Representative. Only the general manager of Owner has the authority to alter or modify any of the terms or provisions of the Contract Documents. No modification or change to the Contract Documents shall be effective for any purpose unless the change or modification has been expressly approved, in writing, by the general manager of Owner. Any requested changes by the Contractor to the approved plans and specifications must be submitted to the Owner's Engineer for review and approval through the Owner's Representative. No changes to the approved plans or specifications shall be effective for any purpose unless the Owner's Engineer

has expressly approved of the change, in writing. The Contractor is expressly prohibited from entering onto private property, disturbing any habitat, or using private property to stockpile, store, or spread any men, tools, equipment, materials, or dirt without the express prior written consent of the general manager of Owner. The violation of this section by Contractor or any of its subcontractors, materialmen, or suppliers or their respective directors, officers, managers, members, agents, consultants or employees shall constitute a material breach of this Agreement.

SECTION 11 FORMS

11-1 SHOP DRAWING SUBMITTAL FORM

The Contractor shall complete the Shop Drawing Submittal Form included at the end of the General Provisions when submitting Shop Drawings as called for in the Special Provisions and Standard Specifications or requested by the Owner's Representative. Duplication of this form is permissible to comply with the requirements of the Contract Documents. No substitution or revision to this form will be accepted and approved by the Owner.

11-2 PROGRESS ESTIMATE AND PAYMENT FORM

The Contractor will use the Progress Estimate and Payment Form included at the end of the General Provisions when preparing the monthly progress payment for review. No progress payment will be processed to pay the Contractor until the progress estimate and payment form and the release form included at the end of these general provisions have been fully completed and submitted by the Contractor to the Owner's Representative and approved by the Owner.

11-3 RELEASE FORM(S)

The Contractor shall complete the Conditional and/or Final Release Forms (as appropriate) included at the end of the General Provisions and submit to the Owner for the corresponding pay period in accordance with Article 9-6, REQUIRED RELEASES. Duplication of this form is permissible to comply with the requirements of the Contract Documents. No substitution or revision to this form will be accepted. No payment request to the Contractor will be processed until the Release Form has been fully completed and submitted by the Contractor.

END OF SECTION

SHOP DRAWING SUBMITTAL FORM

TO: OWNER'S REPRESENTATIVE
c/o Olivenhain Municipal Water District
1966 Olivenhain Road
Encinitas, CA 92024

From: (Contractor)
(Address)

Contractor Job Number _____

Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT**

OMWD PN: _____

Project: **THE GARDENDALE AND VILLAGE PARK WEST
PRESSURE REDUCING STATIONS (PRS)
REPLACEMENTS**

OWNER'S REP ACCT NO. _____

SUBMITTAL NO.: _____

RESUBMITTAL: Yes No

SPECIFICATION SECTION: _____

DESCRIPTION: _____

This Shop Drawing Submittal has been prepared by the Contractor or any subcontractor, manufacturer, supplier, or distributor and illustrates some portion of the work. The Contractor warrants one of the following conditions:

The Contractor has approved this submittal and represents that the material, equipment, and other work shown conforms to the Plans and Specifications.

The Contractor has approved this submittal but represents that this is a deviation from the requirements of the Plans and Specifications and has set forth the reasons for the deviation below.

DEVIATION/REVISIONS:

By: _____

Title: _____

(BLANK)

(BLANK)

PROGRESS ESTIMATE AND PAYMENT FORM

Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT** OMWD _____

Project: **THE GARDENDALE AND VILLAGE PARK WEST**
PRESSURE REDUCING STATION (PRS) REPLACEMENTS Contract End Date _____

Contractor: _____ Revised Contract End Date _____

PAY ESTIMATE NO. _____

PERIOD WORK PERFORMED: _____ Contract Job No. _____

Date Created _____

Work Item	Description of Work Item	Total Cost of Work Item	Percent Complete	Value of Work

Total Project Cost of Work Items _____

Estimated Total Value of Work Performed _____

Less Five Percent (5%) of Such Estimated Total Value _____

Total Amount Due for Work Performed _____

Less All Previous Payments _____

AMOUNT DUE AND PAYABLE TO THE CONTRACTOR

Prepared by Owner's Representative _____ Accepted by CONTRACTOR By: _____ Date: _____	<input type="checkbox"/> CM has reviewed and approved monthly as-builts and schedule updates Approved by OWNER By: _____ Date: _____
---	---

Distribution: Owner Contractor Engineer Finance

(BLANK)

**CONDITIONAL WAIVER AND RELEASE ON
PROGRESS PAYMENT**

(CA CIVIL CODE §8132) (1)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information:

Name of Claimant: _____

Name of Customer: **Olivenhain Municipal Water District** _____

Job Location: _____

Owner: Olivenhain Municipal Water District _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: Olivenhain Municipal Water District _____

Amount of Check: _____

Check Payable to: _____

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:
Date(s) of waiver and release: _____
Amount(s) of unpaid progress payment(s): \$ _____
- (4) Contract rights, including:
(A) a right based on rescission, abandonment, or breach of contract, and
(B) the right to recover compensation for work not compensated by the payment.

SIGNATURE

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

(BLANK)

**CONDITIONAL WAIVER AND RELEASE ON
FINAL PAYMENT**
(CA CIVIL CODE §8136) (3)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information:

Name of Claimant: _____

Name of Customer: **Olivenhain Municipal Water District** _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: Olivenhain Municipal Water District _____

Amount of Check: _____

Check Payable To: _____

Exceptions

This document does not affect any of the following:

Disputed claims for extras in the amount of: \$ _____

SIGNATURE

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

(BLANK)

PROPOSED CHANGE ORDER

Owner: **OLIVENHAIN MUNICIPAL WATER DISTRICT**

Project: **THE GARDENDALE AND VILLAGE PARK
WEST PRESSURE REDUCING STATION (PRS)
REPLACEMENTS**

Contractor: _____

PROPOSED CHANGE ORDER NO. _____

Date: _____

*A change to the contract documents for the above referenced project is being considered. Please provide cost and schedule impact(s) for the following described work:

DESCRIPTION OF CHANGE / PCO's	Cost Impact	Schedule Impact
	\$ _____	_____ Day(s)

TOTAL	\$ _____	_____ Calendar Day(s)
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NOTE: Attention is called to the sections in the General Provisions on Scope of Work and Estimates and Payments.

THIS PROPOSED CHANGE ORDER IS NOT EFFECTIVE UNTIL A CONTRACT CHANGE ORDER HAS BEEN APPROVED BY OWNER.

This PCO was initiated by _____ On _____

Submitted _____ On _____
Contractor

(BLANK)

Article 1.5

RESOLUTION OF CONSTRUCTION CLAIMS

Section	Section
20104. Application of article; provisions included in plans and specifications.	20104.6. Payment on undisputed portion of claim; interest on arbitration awards or judgments
20104.2. Claims; requirements; tort claims excluded.	20104.8. Repealed.
20104.4. Civil action procedures; mediation and arbitration; trial de novo; witnesses.	

Article 1.5 was added by Stats. 1994, c. 726 (A.B. 3069), § 22, eff. Sept. 22, 1994.

Former Article 1.5, Resolution of Construction Claims, consisting of §§20104 to 20104.8, added by Stats. 1990, c. 1414 (A.B. 4165), § 2, was repealed by Stats. 1990, c. 1414 (A.B. 4165), § 2, operative Jan. 1, 1994.

§ 20104. Application of article; provisions included in plans and specifications

(a) (1) This article applies to all public works claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between a contractor and local agency.

(2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2.

(b) (1) "Public work" has the same meaning as in Sections 3100 and 3106 of the Civil Code, except that "public work" does not include any work or improvement contracted for by the state or the Regents of the University of California.

(2) "Claim" means a separate demand by the contractor for (A) a time extension, (B) 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 (C) an amount the payment of which is disputed by the local agency.

(c) The provisions of this article or a summary thereof shall be set forth in the plans or specifications for any work which may give rise to a claim under this article.

(d) This article applies only to contracts entered into on or after January 1, 1991.

(Added by Stats. 1994, c. 726 (A.B. 3069), § 22, eff. Sept. 22, 1994.)

Historical and Statutory Notes

1990 Legislation

Former § 20104 was renumbered Public Contract Code § 20103.5 and amended by Stats. 1990, c. 1414 (A.B. 4165), § 1.

Former § 20104, added by Stats. 1990, c. 1414 (A.B. 4165), § 2, relating to application of article regarding resolution

of construction claims, was repealed by Stats. 1990, c. 1414 (A.B. 4165), § 2, operative Jan. 1, 1994. See, now, this section.

Derivation: Former § 20104, added by Stats. 1990, c. 1414, § 2.

§ 20104.2 Claims; requirements; tort claims excluded

For any claim subject to this article, the following requirements apply:

(a) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.

(b) (1) For claims of less than fifty thousand dollars (\$50,000), the local agency shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 80 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.

(c) (1) For claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000), the local agency shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

(d) If the claimant disputes the local agency's written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15 days of receipt of the local agency's response or within 15 days of the local agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

(f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of Government Code.

(Added by Stats. 1994, c. 726 (A.B. 3069), § 22, eff. Sept. 22, 1994.)

Historical and Statutory Notes

1990 Legislation

Former § 20104.2, added by Stats. 1990, c. 1414 (A.B. 4165), § 2, amended by Stats. 1991, c. 1029 (A.B. 1086), § 1, relating to requirements for claims filed under the article,

was repealed by Stats. 1990, c. 1414 (A.B. 4165), § 2, operative Jan. 1, 1994. See, now, this section.

Derivation: Former § 20104.2, added by Stats. 1990, c. 1414, § 2, amended by Stats. 1991, c. 1029, § 1.

Library Reference

California Practice Guide: Alternative Dispute Resolution, Knight, Fannin & Disco, see Guide's Table of Statutes for chapter paragraph number references to paragraphs discussing this section.

Civil Procedure Before Trial, Well & Brown, Guide's Table of Statutes for chapter paragraph number references to paragraphs discussing this section.

§ 20104.4 Civil action procedures, mediation and arbitration; trial de novo; witnesses

The following procedures are established for all civil actions filed to resolve claims subject to the article:

(a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

(b) (1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.

(c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

(Added by Stats. 1994, c. 726 (A.B. 3069), § 22, eff. Sept. 22, 1994.)

Historical and Statutory Notes

1990 Legislation

Former § 20104.4, added by Stats. 1990, c. 1414 (A.B. 4165), § 2, amended by Stats. 1991, c. 1029 (A.B. 1086), § 2, relating to procedures for civil actions filed to resolve construction claims, was repealed by Stats. 1990, c. 1414

(A.B. 4165), § 2, operative Jan. 1, 1994. See, now, this section.

Derivation: §20104.4, added by Stats. 1990, c. 1414, § 2, amended by Stats. 1991, c. 1029, § 2.

Library Reference

California Practice Guide: Alternative Dispute Resolution,
Knight, Fannin & Disco, see Guide's Table of Statutes

for chapter paragraph number references to paragraphs
discussing this section.

§ 20104.6 Payment on undisputed portion of claim; interest on arbitration awards or judgments

(a) No local agency shall fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the contract.

(b) In any suit filed under Section 20104.4, the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

(Added by Stats. 1994, c. 726 (A.B. 3069), § 22, eff. Sept. 22, 1994.)

Historical and Statutory Notes

1990 Legislation

Former § 20104.6, added by Stats. 1990, c. 1414 (A.B. 4165), § 2, relating to payment of undisputed portion of claims, was repealed by Stats. 1990, c. 1414 (A.B. 4165), § 2, operative Jan. 1, 1994. See, now, this section.

Derivation: Former § 20104.6, added by Stats. 1990, c. 1414, § 2.

§ 20104.8 Repealed by Stats. 1990, c. 1414 (A.B. 4165), § 2, operative Jan. 1, 1994

Historical and Statutory Notes

The repealed section, added by Stats. 1990, c. 1414 (A.B. 4165), § 2, related to application of the article to specified

contracts and provided for repeal of the article on Jan 1, 1994.

SECTION 00810 – SPECIAL PROVISIONS

1.01 DEFINITIONS

Whenever the following terms occur in the Contract Documents, the meaning shall be interpreted as follows:

ATTORNEY FOR Owner – Alfred E. Smith, Nossaman LLP, 777 South Figueroa Street, 34th Floor, Los Angeles, CA 90017, (213) 612-7831

BOARD OF DIRECTORS – Board of Directors of the Olivenhain Municipal Water District.

CITY – City of Encinitas, 505 South Vulcan Ave. Encinitas, CA 92024

CONTRACT TIME – The number of consecutive days stated in the contract documents commencing from the date of the Notice to Proceed, for completion of the Work.

DATE OF AWARD OF CONTRACT – The date of the District Resolution (formal action of the Board of Directors of the District) awarding the Contract.

DISTRICT – Olivenhain Municipal Water District (OMWD), 1966 Olivenhain Road, Encinitas, California 92024, (760) 753-6466.

DISTRICT'S REPRESENTATIVE – The Owner's Representative.

DRAWINGS or PLANS – Construction drawings entitled “**THE GARDENDALE AND VILLAGE PARK WEST PRESSURE REDUCING STATION (PRS) REPLACEMENTS**”. For items not included in the construction drawings, construct the item in accordance with Regional Standard Drawings.

ENCINA – Encinia Wastewater Authority, 6200 Avenida Encinas Carlsbad, (760) 438-3941

ENGINEER – The Owner's Representative. Balboa Engineering, Inc., 14204 Caminito Lazanja, San Diego, CA 92127, Tel: (858) 200-5044

LWD – Leucadia Wastewater District, 1960 La Costa Ave, Carlsbad, CA , (760)753-0155

MORATORIUM – City of Encinitas Trench Cut Moratorium, See 1.37 of this Section 00810

OWNER – Olivenhain Municipal Water District (OMWD), 1966 Olivenhain Road, Encinitas, California 92024, Tel: (760) 753-6466; Fax: (760) 753-1578.

OWNER'S REPRESENTATIVE – The person or engineering/architectural firm authorized by the District to represent it during the performance of the work and until final acceptance. The Owner's Representative is referred to throughout the Contract Documents as if singular in number and masculine in gender. The Owner's Representative means the Owner's Representative and his assistants.

PUBLIC WORKS SPECIFICATIONS – Standard Specifications for Public Works Construction Current Edition by APWA/AGC, the “GREENBOOK”, Current Edition.

REGIONAL STANDARD DRAWINGS – Standard Drawings for Agencies in the San Diego Region as recommended by the Regional Standards Committee and published by the San Diego County Department of Public Works, Current Edition.

SPECIAL PROVISIONS – Section 00810 of the specifications.

SPECIFICATIONS – Division 1 to 15 of the technical specifications contained in these Contract Documents, and those technical specifications contained in the Drawings.

STANDARD DRAWINGS – Drawings A-1.1 through G-15 of the Olivenhain Municipal Water District, Standard Specifications and Drawings for the Construction of Water, Recycled Water, and Sewer Facilities, Current Edition. San Diego Regional Standard Drawings 2022 Edition. City of Encinitas Standard Drawings

STANDARD SPECIFICATIONS – Divisions 1 through 15 of the Olivenhain Municipal Water District, Standard Specifications and Drawings for the Construction of Water, Recycled Water, and Sewer Facilities, dated February 2017, with revisions.

STATE STANDARD SPECIFICATIONS – State of California, Department of Transportation, Standard Specifications, Current Edition, Caltrans.

STATE STANDARD PLANS – State of California, Department of Transportation, Standard Plans, Current Edition, Caltrans.

WATER AUTHORITY – San Diego County Water Authority

Whenever the following terms appear in the State Standard Specifications or Public Works Specifications, the meaning shall be interpreted as follows:

AGENCY, BOARD or DEPARTMENT – The Owner.

ENGINEER – The Owner’s Representative.

1.02 TERMS

- A. Command type sentences used in the Contract Documents refer to and are directed to the Contractor.

1.03 ABBREVIATIONS

- A. Interpret abbreviations used on the Drawings and in the Specifications as explained on the Drawings.

1.04 MARKING AND ADDRESSING BID ENVELOPE

- A. Bids shall be sealed in an envelope marked and addressed as set forth in the Notice Inviting Sealed Bids.

1.05 AWARD OF CONTRACT OR REJECTION OF BIDS

- A. Within a period of 60 calendar days after the opening of bids, the District will accept or reject the bids.

1.06 CONTRACTOR'S LICENSING REQUIREMENTS

- A. The District has determined the license classification necessary to bid and perform the subject contract. In no case shall this contract be awarded to a specialty contractor whose classification constitutes less than a majority of the portion of the work of this contract, all work to be performed outside of the contractor's license specialty, except work specifically authorized by District, shall be performed by a licensed subcontractor in compliance with the Subletting and Subcontractor Fair Practices Act commencing with Section 4100 et seq., of the Public Contract Code. See Business and Professions Code Section 7059.
- B. The Contractor's license classification required for this project is a California State Contractor's License A – General Engineering.
- C. It is the District's intent that "plans", as used in Public Contract Code Section 3300, is defined as the construction Contract Documents, which include both the Drawings and the Specifications

1.07 TIME FOR COMPLETION AND FORFEITURE DUE TO DELAY

- A. The work shall be completed within **THREE HUNDRED FORTY (340) CONSECUTIVE CALENDAR DAYS** from and after the date of the Notice to Proceed.
- B. The Contractor will not be permitted to begin work until the agreement, bonds or substitutes, insurance certificates and endorsements are acceptable to the District and Attorney for District. This period of time is set forth in Paragraph 3-2 Execution of Contract in the General Provisions. Time is of the essence in this contract.
- C. The Contractor shall complete all work in its entirety as specified in the Contract Documents within these time periods. Time of completion shall also include time for all submittals and coordination required to satisfy the requirements of these Contract Documents.
- D. The Contractor agrees that the work shall be prosecuted regularly, diligently, and uninterruptedly and at such rate of progress as will ensure full completion thereof within the Time for completion stated above including minimizing Construction Highline and customer interruption of water service. It is expressly understood and agreed, by and between Contractor and District that the Time for completion is reasonable for the completion of the WORK, taking into consideration the average climatic range, usual industrial conditions prevailing in this locality, and lead time required to procure equipment.
- E. The Contractor shall provide proof of delays caused from equipment or material procurement outside of his/her control for approval by the Owner. Approved delays shall be remedied by additional time to the contract and shall not include additional compensation.

- F. The Contractor shall provide submittals to the Owner for long-lead items seven (7) working days after issuance of the Notice to Proceed. Delays to the contract time for completion as a result of the Contractor's failure to provide submittals for long-lead items within this time period will not be considered by the Owner for requests for additional time.
- G. Contractor shall only take one PRS out of service at a time. See Section 01043 1.3 E.

1.08 LIQUIDATED DAMAGES

- A. Pursuant to Government Code 53069.85, forfeiture for each day project completion is delayed beyond the time allowed shall be at the rate of \$2,000.00 per day, except as noted below.

1.09 PERMITS

- A. The Contractor shall obtain and pay for all required permits and provide copies of all permits to the District's Representative prior to starting work, including the San Diego County Air Pollution Control District's permits for construction and operation of diesel generators, if used. The Contractor shall comply with the ordinances, directives, and regulations of the respective agencies with jurisdiction over the area of the work. All work not specifically covered in the required permits shall conform to the requirements of these Specifications. The cost of all permits and plan check review shall be borne by the Contractor and included in the Contractor's bid.
- B. The Contractor shall be responsible for developing haul routes for the importing or exporting of materials or equipment for the project and obtaining and paying for all required permits from the affected agencies of jurisdiction, i.e., City of Encinitas. The Contractor shall provide copies of all required permits to the District's Representative prior to starting work. The Contractor shall comply with the ordinances, directives, and regulations of the respective agencies with jurisdiction over the area of the work. All costs for transport fees, dump fees, plan or haul route reviews, permits, and related incidentals shall be borne by the Contractor and included in the Contractor's bid.

1.10 USE OF ASBESTOS PRODUCTS NOT PERMITTED

The intent of the Contract Documents is to provide asbestos-free components throughout the project in accordance with the recent Environment Protection Agency stated policy seeking a ban on the use of all products containing asbestos. Where the Contract Documents or the referenced specifications, standards, codes, or tests refer to products containing asbestos, the Contractor shall provide acceptable alternatives under those documents, or in the absence of such referenced alternatives, he shall submit a proposed substitute to the District's Representative for review and acceptance.

1.11 ABATEMENT OF AIR POLLUTION

- A. Comply with all applicable Federal, State, County, and City laws and regulations concerning the prevention and control of air pollution.

- B. Conduct construction activities and equipment in a manner so as to minimize atmospheric emissions or discharges of air contaminants. Equipment or vehicles that show excessive emissions of exhaust gases shall not be operated on the site.

1.12 NOISE CONTROL REQUIREMENTS

- A. The Contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the Contract.
- B. The Contractor shall familiarize themselves with the City or County Zoning Performance Standards applicable to night work and day work.
- C. Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.
- D. Each vehicle equipped with a back-up alarm shall use a white noise back-up alarm Brigade BBS-97 or equal at all times.
- E. Noise level requirements shall apply to all equipment on the job or related to the job, including but not limited to trucks and transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety for the protection of personnel.
- F. All work shall be coordinated with OMWD Staff as to insure minimal disruption to daily operations on the OMWD Campus.

1.13 AMOUNT OF LIABILITY INSURANCE

A. Employer's Liability Insurance:

1. Bodily injury coverage by accident shall be for not less than \$1,000,000 for each employee and \$1,000,000 for each accident.
2. Bodily injury coverage by disease shall be for not less than \$1,000,000 for each employee and \$1,000,000 for each disease.

B. General Liability:

Bodily injury, personal injury, and property damage coverage shall be in a combined single limit of not less than \$1,000,000 for each occurrence and \$2,000,000 aggregate.

C. Automobile Liability:

1. Bodily injury and property damage coverage shall be in a combined single limit of not less than \$1,000,000 for each occurrence and \$2,000,000 aggregate.

D. Builder's Risk Insurance:

1. Builder's Risk Insurance shall be provided for the **full contract amount**.

E. Earthquake and Tidal Wave Insurance:

1. Earthquake and Tidal Wave Insurance is not required for this project.

F. Additional Insured:

1. In addition to the additional insureds required for Liability insurance in the General Provisions, 8-3 LIABILITY INSURANCE, and 8-4 BUILDER'S RISK "ALL RISK" INSURANCE, the District and each of its directors, officers, employees, and agents and its Design Engineer shall be named as additional insureds for all Liability insurance and Builders' Risk Insurance provided herein.

1.14 USE OF THE STANDARD DRAWINGS

- A. Where the Drawings or Specifications make reference to the Standard Drawings, construct the item in accordance with the details and materials as specified in the Contract Documents. For items not included in the Standard Drawings that are part of the Contract Documents, construct the item in accordance with the Olivenhain Municipal Water District, Standard Specifications and Drawings for the Construction of Water, Recycled Water, and Sewer Facilities dated June 2008 with revisions. These District Standard Drawings and Standard Specifications are available for purchase at the office of the District.

1.15 CONSTRUCTION SCHEDULE AND BID BREAKDOWN

- A. The Contractor shall conform to the requirements of Article 6-3 Contractor's CONSTRUCTION SCHEDULE AND COST BREAKDOWN of the General Provisions within 15 days after the date of award of contract. Submit to the District's Representative a construction progress schedule and bid breakdown in bar chart form. Divide each lump sum bid item into its major elements of work and show separately labor, materials and equipment costs. The District's Representative will use this cost breakdown as a basis for the monthly progress estimate and payment. The schedule shall specifically include and identify the construction sequence requirements defined on the plans.

1.16 STORM DRAIN PROTECTION

A. The Contractor shall comply with all local ordinances, County of San Diego Ordinance No. 9424, National Pollutant Discharge Elimination Permit Number CAS 0108758 and State Water Resources Control Board NPDES Permit No. CAS000002. The Contractor shall install and maintain Best Management Practices (BMPs) to the Maximum Extent Practicable (MEP) to prevent or reduce pollutant discharges to local storm drain/storm water conveyance systems and/or receiving waters from construction activities. The Contractor shall manage the Work to prevent or reduce pollutant discharges to local storm drain/storm water conveyance systems and/or receiving waters. BMPs to be implemented are detailed in the County of San Diego "Stormwater Standards Manual" and shall be applied in the following areas, if applicable to the project:

- (1) Erosion control on slopes;
- (2) Erosion control on flat areas; or BMPs to desilt runoff from flat areas;
- (3) Runoff velocity reduction;
- (4) Sediment control;
- (5) Offsite sediment tracking control;
- (6) Materials management;
- (7) Waste management;
- (8) Vehicle and equipment management;
- (9) Water conservation;
- (10) Structure construction and painting;
- (11) Paving operations;
- (12) Dewatering operations;
- (13) Planned construction operations;
- (14) Downstream erosion control;
- (15) Prevention of non-stormwater discharges;
- (16) Management of run-on discharges;
- (17) Protection of ground water; and

BMPs shall include post-construction BMPs for permanent control of erosion from slopes. These BMPs can include structures to convey runoff safely from the tops of slopes, vegetation or

alternative stabilization of all disturbed slopes and/or the use of natural drainage systems to the MEP.

1.17 PROTECTION OF EXISTING UTILITIES

- A. The Contractor shall coordinate their efforts with the District and shall take every precaution to protect all existing utilities and structures at the project site. The Contractor shall be responsible for all Underground Service Alert notification and mark outs prior to the beginning of work.

1.18 COORDINATION WITH DISTRICT OPERATIONS

- A. The Contractor shall coordinate all work with the District sufficiently ahead of time so as to not interfere with the District's operations. The Contractor shall submit a detailed sequence of work to the District for all work in accordance with Section 01043. This proposed sequence of work shall be reviewed and approved with the District prior to construction for consistency with the Sequence of Work as described in these Contract Documents and the District's required operation.
- B. The Work shall be completed as described in Section 01043.
- C. The two Owner furnished PRS units will be temporarily stored and located within a secured facility. Access to the site shall be provided by the District to allow the contractor to retrieve the units and deliver to the project site. Contractor shall abide by the District's terms of site access at all times including but not limited to abiding by approved working hours, and restrictions to access. The Contractor shall follow the District's safety protocols or the Contractor's safety protocols (whichever is more restrictive) at all times while on District Property.
- D. During PRS retrieval, District Driveway Access/Entrance Gates shall be accessible by District staff at all times, unless specifically approved in writing and coordinated with the District not less than 5 business days in advance.

1.19 PRE-CONSTRUCTION CONFERENCE AND PROGRESS MEETINGS

- A. A Pre-Construction Conference shall be scheduled prior to start of project as described in Section 01201 Preconstruction Conference. The District, the Contractor, and the District's Construction Manager shall be present. The Contractor's detailed sequence of work and a list of labor, material and equipment rates for additional work shall be established and maintained throughout the project. Contractor shall identify all personnel assigned to the project and a complete set of approved submittal data for use by inspection personnel. Contractor shall have a designated representative for this project. **Construction schedule and Schedule of Values are required to be submitted prior to scheduling the Preconstruction Conference** unless otherwise agreed to in writing by the Owner.

- B. The Contractor shall also attend project progress meetings as described in Specification Section 01202, Progress Meetings.

1.20 TRAFFIC CONTROL

The Contractor is responsible for adding temporary striping and maintaining two minimum 12' wide travel lanes in Wandering Rd and Gardendale Rd, and detouring pedestrians to the west side of the roads, for public access around the work zones. The Contractor shall provide two Changeable Message Sign (CMS) boards on Mountain Vista Dr, one in each direction. When one lane of traffic in Wandering/Gardendale Rd is allowed by the City, the Contractor shall provide flaggers at each end of the construction zone. For travel lanes less than the 12' wide minimum, the Contractor shall submit a written request to the City of Encinitas and submit a proposed traffic setup for the reduced width. The City of Encinitas will make the determination whether the reduced widths are acceptable.

Contractor shall provide K-rails, topped with screened fencing as required between vehicle traffic and the work zones in Wandering Rd and Gardendale Rd at the existing PRS excavations and demolitions and new PRS excavations and installations.

To request a full road closure for a specific work activity, the Contractor shall submit a written request to the City of Encinitas. The request shall include a detailed justification for the temporary road closure and anticipated duration. The approval for a full road closure shall be at the City's sole discretion. If a full street closure is approved for a specific work activity, the closure is expected to be limited to a few days. Further, the Contractor shall obtain approval from the Fire Department prior to implementing any full road closures. Conditions for a full road closure:

- a. The City of Encinitas would require the street be trench plated at the end of each working day, unless there is a safety requirement that prevents the Contractor from doing so.
- b. The closures may have limited working hours (to prevent impacts to school drop-off and pick-up periods).
- c. Three CMS boards will be required, two on Mountain Vista, one in each direction, and 1 on Wandering/Gardendale Rd.
- d. The Contractor shall place two CMS boards, one at end of the road to be closed, a minimum of 1 week prior to the closure.

The Contractor is responsible for preparing traffic control plans and obtaining a traffic control permit from the City of Encinitas. Provide appropriate signage and fencing around

the work area. Sidewalk closure and detour will be required. Any changes made to the traffic control is at no additional cost to the District

The Contractor shall be aware of long lead time for jurisdictional agency permit approval and shall account for all associated costs and schedule impacts at no additional cost to the District.

1.21 HOURS OF WORK

Hours of work shall be 7:30 A.M. to 5:00 P.M. unless otherwise specified in writing and agreed to by the District. **Absolutely no equipment shall be started or warmed up prior to 7:30 AM or after 5:00 PM.** Overtime and shift work may be established as short-term procedure by Contractor with written notice to and written permission from District. No work other than overtime and shift work approved by District shall be done between the hours of 5:00 P.M. and 7:30 A.M., nor on weekends, or District recognized holidays, except such work as is necessary for the proper care and protection of the work already performed, except in case of emergency, or as otherwise specified by the District, and as specified herein. Special consideration may be given outside of these established working ours to minimize impact to District Staff and normal business operations. Any special work hours or dates must be arranged and approved by the District in advance of the planned work in writing. The District reserves the right to require any work that interferes with normal scheduled business to be rescheduled. The District recognized holidays are as follows:

- New Year's Day
- Martin Luther King, Jr. Day
- Presidents' Day
- Memorial Day
- Independence Day
- Labor Day
- Veterans Day
- Thanksgiving Day And The Following Friday
- Christmas Day

In the event that a national holiday falls on a Saturday, the previous Friday shall be Considered a holiday. If a national holiday falls on a Sunday, the following Monday shall be considered a holiday.

1.22 CONSTRUCTION SURVEYS

A. LAND MONUMENTS

The Contractor shall notify the District and the District's Representative of any existing Federal, State, City, County, and private land monuments encountered. All monuments shall be preserved, or if necessary to be destroyed during performance of the Work, shall be replaced by a licensed surveyor under contract to the Contractor. Appropriate record of survey drawings shall be filed with the City of Encinitas and County of San Diego for all replaced monuments. When government monuments are encountered, the Contractor shall notify the District's Representative at least two (2) weeks in advance of the proposed construction and provide for surveying of the existing monument before it is disturbed or destroyed.

1.23 GEOTECHNICAL WORK

A. SUBSURFACE INVESTIGATIONS

1. A Geotechnical report has been prepared for the project and is provided in Appendix A. The Contractor shall make independent geotechnical investigations of the project site in order to satisfy himself of the subsurface conditions that may be encountered. No additional compensation will be made for additional geotechnical investigations.

B. CONSTRUCTION TESTING

1. The District shall furnish compaction testing for all bedding, backfill, and soil compaction testing.
2. The District shall furnish all materials testing and special inspections called for in the Contract Documents, including, but not limited to concrete and asphalt pavement.
3. When any work is determined to be unsatisfactory, faulty or defective, or does not conform to the requirements of the Contract Documents, the costs incurred by the District for additional tests or inspections shall be reimbursed by the Contractor. Said costs shall be paid by the District and deducted from progress payments to the Contractor.
4. Contractor shall provide at least 72-hour written notice of its readiness for all special inspection and testing.
5. When tests or inspections cannot be performed after such notice, the Contractor shall reimburse the District for laboratory personnel and travel expenses incurred due to the Contractor's negligence.

1.24 CONSTRUCTION WATER

- A. The Contractor shall obtain and pay for a construction water meter from the District and shall be responsible for all highlines and other temporary equipment and facilities necessary to provide adequate construction water to the project site. The Contractor shall coordinate the locations of water supply with the District.
 1. The Contractor shall submit a construction water service connection plan a minimum of two weeks prior to the need for water. This plan shall indicate all piping, valves, and other materials necessary to connect to District owned piping at designated blow-off, air vacuum, and air release structures located within the project site. Do not install piping, meter, or valves until the District's Representative has approved the water service plan.
 2. Accurately measure all water use and submit meter readings to the District's Representative when the meter is installed, at the end of each month and when the meter is removed.
 3. Securely lock the installed valve in the closed position at the end of each workday and during all times of inactivity. Avoid wasting water and prevent unauthorized use. Do not use water from the District on any other project.

4. Coordinate all use of water, flushing of pipelines and filling of pipelines with the District's representative.

1.25 POWER AND LIGHTING

- A. The Contractor shall provide all power required for construction operations, and shall provide and maintain all temporary power facilities required to perform the work in a safe and satisfactory manner. All electrical facilities shall conform to the requirements of the the requirements of Title 8, Industrial Relations, Subchapter 5, Electrical Safety Orders, of the California Code of Regulation; and Subpart K of the OSHA Safety and Health Standards for Construction.
- B. The Contractor shall provide adequate light for work conducted at night or under low light conditions to provide adequate facilities for inspection and safe working conditions and to insure proper work.
- C. Temporary connections for electricity shall be subject to approval of the District's Representative and the power company representative. Remove temporary electrical connections in like manner prior to final acceptance of the work.

1.26 CONTRACTOR STAGING AND LAYDOWN AREA

- A. Contractor shall obtain approval from the City of Encinitas, for adequate space and area for staging, laydown, and materials storage necessary for completion of this project. Staging and laydown areas, as well as area restrictions, must be established with the City of Encinitas prior to delivery of materials or equipment to the site and are limited to the confines established and agreed to prior to construction.
- B. Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and free from rubbish and debris. The Contractor shall also abate dust nuisance by cleaning or sweeping and sprinkling with water or other means as necessary, in accordance with the San Diego Air Pollution Control District's regulations. The use of water resulting in mud on public streets and/or private property will not be permitted as a substitute for cleaning, sweeping, or other methods. Every day, and as required by the District's Representative, the Contractor shall furnish and operate a motorized, self-loaded sweeper with water spray nozzles to keep paved areas affected by the work acceptably clean and dust free.
- C. The Contractor shall keep the premises free at all times from accumulations of waste materials and rubbish. Contractor shall provide adequate trash receptacles about the site, and shall promptly empty the containers when filled. Wastes shall not be buried or burned on the site or disposed of into storm drains, sanitary sewers, streams, or waterways. All wastes shall be removed from the site and disposed of in a manner complying with local ordinances and antipollution laws. Volatile wastes shall be properly stored in covered metal containers and removed daily. Construction materials shall be neatly stacked by the Contractor when not in use. The Contractor shall promptly remove splattered concrete,

asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage.

1.27 SANITATION AND DRINKING WATER

- A. The Contractor shall provide toilet and wash-up facilities for his work force at the site of work. They shall comply with applicable laws, ordinances, and regulations pertaining to the public health and sanitation of dwellings and camps. The facilities shall be stored within the staging areas overnight and on weekends. The Contractor shall maintain the sanitary facilities in an acceptable condition from the beginning of work to completion and shall remove the facilities and disinfect the premises.
- B. The Contractor shall provide safe drinking water at all times at the jobsite.

1.28 SAFETY

- A. District and its inspectors, consultants, agents and other representatives are in no way responsible for safety and are there only to observe the work compliance with plans and specifications.
- B. As an informational submittal, Contractor shall prepare and submit a general company Health and Safety Plan (HSP), modified or supplemented to include job-specific considerations.
- C. The Contractor acknowledges responsibility for jobsite and acknowledges that the District, Engineer and their agents, employees, consultants and representatives will not have any such responsibility. To the fullest extent permitted by law the Contractor shall indemnify, defend and hold harmless the District, Engineer, their present companies, subsidiaries, agents, and employees from and against all claims, damages, losses and expenses, including but not limited to attorney fees and claim costs, arising out of or resulting from performance of work by the Contractor, its subcontractors, or their agents and employees, which results in damage, loss or expense is caused in whole or in part by the negligence, active or passive, of District, Engineer, their parent and subsidiary companies, as well as their agents and employees, excepting only the sole negligence of District, Engineer, their parent or subsidiary companies and their agents and employees.

1.29 INDEMNIFICATION

- A. Contractor hereby releases and agrees to indemnify, defend, hold harmless the District, the City, Engineer, their parent and subsidiary companies, agents, employees, consultants and representatives for any and all damage to persons or property or wrongful death regardless of whether or not such claim, damage, loss or expense is caused in whole or in part by the negligence, active or passive, of District, Engineer, their parent and subsidiary companies, as well as their agents and employees, excepting only the sole negligence of District, Engineer, their parent or subsidiary companies and their agents and employees to the

fullest extent permitted by law. Such indemnification shall extend to all claims, demands, actions, or liability for injuries, death or damages occurring after completion of the project, as well as during the work's progress. Contractor further agrees that it shall accomplish the above at its own cost, expense and risk exclusive of and regardless of any applicable insurance policy or position taken by any insurance company regarding coverage.

- B. Contractor shall defend, indemnify and hold the District, the City, Engineer, its employees, officers, or agents, harmless against any and all claims by any parties arising from, or related to, any and all damages, including legal costs and attorney's fees, resulting from interference with, interruption of, damage to, or any and all injuries which result from damage caused to subsurface installation, which is unforeseen and despite Engineer's/Architect's effort during the design process was not located, excepting only the gross negligence or willful misconduct of Engineer in providing its services.

1.30 AUDIO-VIDEO DOCUMENTATION OF PROJECT SITE

- A. A minimum of two (2) weeks prior to start of construction, the Contractor shall provide pre-construction digital color audio-video documentation as specified herein for the purpose of establishing the surface conditions existing in all of the areas to be affected by the construction and to avoid potential construction repair disputes. The Contractor shall be responsible for repairing any damage or defect not documented as existing prior to construction.
- B. Digital color audio-video documentation shall consist of the recordation of surface features taken along the entire length of the project, including all work, storage, and staging areas and all intersecting roadways. Prior to audio-video taping of the project, all areas to be documented shall be investigated visually with notations made of items not readily visible by taping methods.
- C. Coverage of the digital color audio-video documentation shall include, but not be limited to: all existing driveways, sidewalks, curbs, streets, signs, landscaping, trees, catch basins, fences, monuments, visible utilities and all buildings located within the zone of influence. Of particular concern are any existing faults, fractures, cracks, defects or other features. Front and/or side yard areas of residential homes within the zone of influence of construction shall also be recorded. Audio description shall be made simultaneously with and support the video coverage.
- D. Two (2) copies of the digital color audio-video documentation shall be provided to the District's Representative on DVD, USB Flash Drive or other electronic data storage device suitable to the District prior to the start of construction. Utility mark out (USA) shall be completed prior to the audio-video documentation and shall be included in the pre-construction audio-video documentation. Any project areas not fully documented shall be re-shot as directed by the District's Representative.

- E. Construction work shall not commence until audio-video documentation has been delivered to the District's Representative.

1.31 MEASUREMENT AND PAYMENT

A. General:

1. The measurement and payment provisions of these Contract Documents shall govern over those of referenced standards, if any.
2. The price set forth in the Bid Form for the work shall include all costs and expenses incidental to completing the work, and payment of the price bid will be payment in full under this contract, except as provided by Article 9-1 PAYMENT FOR CHANGES IN THE WORK of the General Provisions.
3. As a condition precedent to approval of the Contractor's monthly payment application by the District's Representative, the Contractor shall attend all progress or issue resolution meetings scheduled by the District's Representative. In addition, the Contractor shall submit a monthly construction schedule properly updated and accurately showing the work completed to date and the work yet to be performed in the remaining Contract time. The Contractor agrees failure to comply with the foregoing to the satisfaction of the District's Representative shall delay the monthly progress payment to the Contractor without penalty to the District. The District's representative shall review monthly updated as-builts as a condition of monthly payment.

B. Lump Sum Work Items Listed in the Bid Schedule:

1. The lump sum prices include full compensation for furnishing the labor, materials, tools, and equipment and doing all the work involved to complete the work included in lump sum work items listed in the Bid Schedule and defined by the Contract Documents.
2. The application for payment for a lump sum payment item will be for that specific work item based on the percentage completed. The percentage complete will be based on the value of partially completed work relative to the value of the item when entirely completed and ready for service. The application for payment will be in accordance with Article 9-2 PROGRESS PAYMENTS of the General Provisions.

C. Work Items Not Listed in the Bid Schedule:

1. The General Provisions and items in the Special Provisions which are not listed in the Bid Schedule of the Bid Form are, in general, applicable to more than one listed work item, and no separate work item is provided therefor. Include the cost of work not listed but necessary to complete the project designated in the Contract Documents in the various listed work items of the Bid Form.
2. The bids for the work are intended to establish a total cost for the work in its entirety. Should the Contractor feel that the cost for the work has not been established by specific

items in the Bid Form, he shall include the cost for that work in some related bid item so that his bid for the project does reflect his total cost for completing the work in its entirety.

1.32 NOTICE OF COMPLETION

- A. Contractor shall apply for acceptance of the work encompassed in the Bid Schedules in writing to the District. The District's representative will conduct an inspection and issue a deficiency list, as applicable. Upon substantial completion of the work encompassed in the Bid Schedule and resolution of the deficiency list, the District, at the District's sole discretion, will issue a Notice of Substantial Completion for this work.
- B. Upon completion of all work in the Bid Schedules in accordance with the Contract documents, Contractor shall apply for acceptance of the work. Upon acceptance of the work encompassed in the Bid Schedules, the District, at the District's sole discretion, will prepare a Notice of Completion for consideration and approval by the District Board of Directors.

1.33 LABOR COMPLIANCE PROGRAM AND CONTRACTOR REGISTRATION WITH STATE OF CALIFORNIA

- A. In accordance with requirements defined by the California State Legislature via Senate Bill 854, all contractors and subcontractors involved with public works project shall be registered with the State Department of Industrial Relations. Registration is completed through an on-line application process and the payment of a fee to the State. The registration process requires contractors and subcontractors to provide workers' compensation coverage to its employees, hold a valid Contractors State Board License, have no delinquent unpaid wage or penalty assessments, and not be subject federal or state debarment. The registration form is located on the State Department of Industrial Relations website:

<http://www.dir.ca.gov/DLSE/dlsepublicworks.html>

- B. Prior to start of construction, the Contractor shall submit to the District evidence of completing this registration for the prime firm and all subcontracting firms. Failure to submit the requested documentation shall be cause for delay of the project and subject to forfeiture due to delay in accordance with paragraph 1.07 of the Supplement to General Provisions.

1.34 GENERATIVE ARTIFICIAL INTELLIGENCE

- A. Any use of generative artificial intelligence software during this contract shall be disclosed to and approved by the District prior to its use, including the type of software. District data shall not be used in any generative artificial intelligence tool without express written permission by the District, including disclosing intended use and platform.

1.35 SITE RESTORATION

- A. Contractor shall return all disturbed areas to pre-construction conditions including, but not limited to topographic elevations, grade and material of existing surface, slopes, curb and gutter, sidewalks, driveways, striping, seal coatings, landscaping, sod grass, fences, irrigation lines and facilities, railroad ties, District facilities, and structures.

1.36 TREE AND LANDSCAPE PROTECTION

- A. Contractor shall protect trees and existing landscape in place in accordance with the Contract Documents. No tree shall be cut or trimmed without approval of a certified arborist and a District Representative. The cutting of roots greater than 2-inches in diameter shall not be allowed and hand-digging will be required.

1.37 TRENCH CUT MORATORIUM

- A. There are two City of Encinitas Moratoriums around the Gardendale PRS. One Moratorium includes the intersection of Mountain Vista Dr and Gardendale Rd, expiring February 24, 2027, and the other includes Gardendale Rd between Mountain Vista Dr and Village Run East, expiring November 17, 2026.
- B. Contractor shall submit and obtain a Trench Cut Moratorium Waiver request, from the City of Encinitas for the work performed in Gardendale Rd. The contractor shall be responsible for pavement restoration requirements as required by the Moratorium. See Appendix C.

1.38 DISTRICT FURNISHED EQUIPMENT

- A. The District will furnish two (2) – Pressure Reducing Stations (PRS) manufactured by Engineered Fluid Inc (EFI). The District will provide the contractor will final shop drawings.
- B. The Contractor and the District shall make a joint inspection of the condition of each piece of equipment furnished by the District and shall note, in writing, the defects in said equipment. Damage or loss of equipment and materials after the date of their transfer to the Contractor shall be repaired or replaced at the Contractor’s expense.
- C. After the joint inspection is complete, the Contractor shall assume custody of the pre-purchased equipment upon mobilization at the Project site and shall assume liability for damage to the equipment thereafter including during transfer of the equipment from storage at the District HQ site in preparation for installation.
- D. Approved manufacturer’s shop drawings will be provided to the contractor following final procurement by OMWD. The contractor will be notified once units are shipped by the manufacturer.
- E. Contractor shall perform commissioning and acceptance testing, and startup of each PRS and appurtenances.
 - a. Contractor shall schedule commissioning for each PRS with District Operations staff prior to any startup.
 - b. The District will provide a factory trained representative of the Manufacturer for field start-up service with instruction. The factory trained representative will provide one

(1) site visit per PRS. Contractor shall be responsible for coordinating with Owner's Representative sufficiently in advance to allow for assignment and scheduling. All costs, including travel, lodging, meals, and incidentals, for additional visits shall be at no additional cost to the District.

1.39 PUBLIC NOTICE

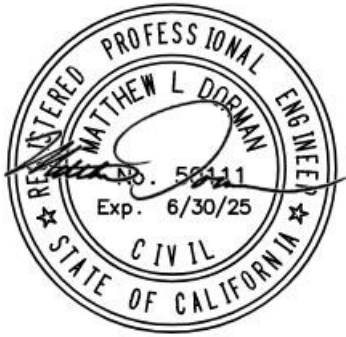
- A. The Contractor shall coordinate public notices to be distributed by the District at a minimum 2 weeks before starting construction, as well as 72 hours in advance of a shutdown or low pressure notifications. Contractor shall provide the District with detailed schedule information for public notice. This notice shall be distributed to all residents and occupants within 300 ft of where construction work is to be performed.
- B. All costs for printing, distributing and hanging of notices shall be the District's responsibility.
- C. If the work is delayed significantly from initial notification, the Contractor shall compensate the District to re-notify residents and occupants of the new work schedule.

END OF SECTION

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PART II

TECHNICAL SPECIFICATIONS



2/09/24



02/09/24

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SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 LOCATION AND DESCRIPTION OF WORK

- A. The Work for this project will consist of the construction of: approximately 235 linear feet of 6-, 8-, 10- and 14-inch diameter ductile iron pipe (DI) for water distribution service and appurtenances and connections to existing systems; installation of cathodic protection systems; the abandonment/demolition of two existing buried PRS stations; installation of two Owner furnished EFI PRS units, restoration of landscape; site restoration and reconstruction of existing pavements, concrete gutters, curb, and sidewalks, striping and markings, curb ramps, and improvements damaged during construction or ordered for replacement; and all incidental work necessary for a complete and operable distribution piping system and two PRS in accordance with the Contract Documents.
- B. The two sites of Work are located at Wandering Rd (Village Park West PRS), the intersection of Mountain Vista Dr and Wandering Rd, and Gardendale Rd (Gardendale PRS) within the City of Encinitas, California in the County of San Diego, California. Refer to the Drawings for vicinity and project location maps.

1.2 CONTRACTS

- A. The Work shall be constructed under one prime contract.

1.3 WORK BY OTHERS

- A. Work by Franchise Utilities. All costs for coordination with the franchise utilities or for any Work performed by Contractor associated with franchise utilities shall be borne by Contractor at no additional cost to Owner. Costs for compensation to franchise utilities for work performed by their forces shall be paid for by the Contractor.

1.4 SALVAGE

- A. The Owner may desire to salvage certain items of existing equipment which are to be dismantled and removed during the course of construction. Prior to removal of any existing equipment from the site of the Work, the Contractor shall ascertain from the Engineer whether or not the particular item or items are to be salvaged. Items to be salvaged shall be stockpiled on the site in a location as directed by the Engineer. All other items of equipment shall be disposed of off-site by the Contractor at his own expense.

1.5 CONTRACT METHOD

- A. The work hereunder will be constructed under a single contract, the total cost of which is a total lump sum and allowance items as outlined in Section 01150
- B. The Contractor shall include all Contract Documents as a part of all its subcontract agreements.

1.6 NOT USED

SECTION 01010 - SUMMARY OF WORK

1.7 CONTRACTOR'S USE OF PREMISES

- A. Contractor's use of the premises shall be as described in the contract documents, Special Provisions, and as approved by the City of Encinitas.
- B. Contractor shall:
 - 1. Assume full responsibility for protection and safekeeping of products stored on or off premises.
 - 2. Move stored products that interfere with the operations of Owner or other contractors.
 - 3. Obtain and pay for all additional storage or work areas required for Contractor operations.

1.8 Owner's USE OF THE PROJECT

- A. The Contractor shall cooperate with the Owner to minimize interference with the Owner's operations and to facilitate the Owner's operations in accordance with Section 01043.

1.9 NOT USED

1.10 OPERATION OF EXISTING WATER SYSTEM PROHIBITED

- A. The Contractor shall at no time undertake to close off any lines, open any valves or take any other action which would affect the operation of the existing water system, except as specifically required by the Contract Documents and after approval is granted by the Owner. Request approval fourteen (14) working days in advance of the time that any interruption/shutdown of the existing system is required.
- B. Work on existing structures and facilities shall be performed on a schedule and in a manner that will permit the existing facility to operate continuously, unless otherwise approved in writing by the Owner of the existing utility and/or facility affected.

1.11 CONTRACT TERMINATION

- A. The Owner may terminate this Contract without cause by giving seven (7) days prior written notice to the Contractor. In event of a contract termination the Owner will pay the Contractor for that portion of the Contract completed as of the date of termination, less the aggregate of previous payments already disbursed. The Owner will also reimburse the Contractor for all costs necessarily incurred for organizing and carrying out the stoppage of the work and paid directly by the Contractor, not including overhead, general expenses and profit. Contractor shall not be entitled to profit on any portion of the project which has not been completed.

1.12 OWNER'S RIGHT TO STOP WORK

- A. The Owner reserves the right to stop work for any reason, at any time. The Contractor's claim for compensation shall apply to an adjustment in the completion

SECTION 01010 - SUMMARY OF WORK

time of the project only. Any additional costs incurred due to any stop work order, shall be incurred by the Contractor.

1.13 HAZARDOUS WASTE

- A. The Contractor shall perform work in such a manner that there will be no hazardous wastes (fuel, oil, chemical, etc.) generated or left on the site. Should the generation of hazardous waste be necessary in order to complete the Work, it shall be the Contractor's responsibility to take all necessary steps to legally dispose of the waste and any contaminated soil or material. All hazardous waste and/or contaminated soil found on the site which has been left by the Contractor shall be properly disposed of by the Contractor. All necessary documentation of the disposal shall be obtained by the Contractor and shall be submitted to the Owner.

Note: It is unacceptable to store fuels and/or oils on site. The Contractor and Subcontractors must make provisions to fuel equipment on a mobile basis only.

1.14 WATER CONSERVATION

- A. Water resources shall be utilized in a manner that promotes maximum efficiency in the conservation of water. Water storage facilities, transport vehicles or systems shall not be permitted to operate in a faulty/leaky condition. Drop tanks, highlines, and other water handling or water-use facilities shall be kept out of public view, whenever possible.
- B. The Contractor shall obtain and pay for a construction water meter from the District in accordance with Section 00810.
- C. The Contractor shall coordinate pipeline flushing activities with the Owner to ensure clear communication and coordination of those activities.
- D. When "Flushing" new water systems in preparation for agency bacteria testing, a conscientious effort shall be made to recover, store or reuse the water. This may require the use of temporary "High Line" or "Fire Hose" to transport the used water to a temporary holding pond or tank.
- E. Water waste in site preparation, storm drain, sewer, water and miscellaneous operations, is not acceptable in any form. The Contractor shall adjust operations, as required, to meet conservation goals noted herein. If excessive waste occurs, the Owner will direct the Contractor in writing to make the necessary changes within twenty-four (24) hours to conserve water. If water waste continues the Contract may be terminated.

END OF SECTION

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SECTION 01043 - COORDINATION WITH OWNER'S OPERATIONS

PART 1 - GENERAL

1.1 CONTINUATION OF OPERATIONS

- A. The Contractor will be performing work in the vicinity of existing water transmission and distribution facilities. Under these conditions, precautions will be necessary to assure that no damage or unscheduled shutdowns occur to any facilities, including piping, utilities, roads, and structures that are to remain in operation and are not to be modified or replaced. Any temporary facilities, materials, equipment and labor required to achieve this objective shall be provided by the Contractor at his own expense. At the completion of work, all such temporary facilities, materials and equipment remaining shall be removed from the site.
- B. Regarding connection to existing buried piping and facilities at or adjacent to the site, it shall be the responsibility of the Contractor to uncover and verify their locations; elevations; bearings and inclinations; joint locations relative to connection points; materials; and dimensions prior to beginning construction or fabrication of any new materials or facilities which are dependent on the location of existing facilities.

1.2 ORDER OF THE WORK

- A. The work shall be carried as shown on the contract drawings and described in this section, also in such order or precedence as may be found necessary by the Engineer to expedite the completion of the project. After work has begun on any portion or designated part of the project, it shall be carried forward to its final completion.

1.3 SHUTDOWNS, RECONNECTIONS, TIE-INS, AND ABANDONMENTS

- A. Any proposed shutdowns must be indicated on the Contractor's preliminary schedule to be submitted for review by the Engineer at the Pre-Construction Conference. The actual allowable durations of the shutdowns will be determined during the preparation of the detailed construction schedule.
- B. No water system shutdowns or tie-ins to existing pipes will be allowed on a Monday or a Friday or immediately prior to a holiday.
- C. The Contractor shall give the Owner a minimum of fourteen (14) calendar days' notice prior to any proposed excavation or shutdown of existing mains or services. Scheduling shall be subject to Owner approval.
- D. The Contractor shall submit a Shutdown Plan for Owner review and approval, including a complete detailed plan of the Contractor's proposed activities including schedule, manpower, equipment, materials and methods which will be utilized to perform the required work during the proposed shutdown, as well as a detailed list of all items of work which must be accomplished during any shutdown. The Contractor shall coordinate his work to minimize the required number of shutdowns by accomplishing as many tasks as possible during each shutdown period. The Contractor shall submit this list of items to the District Representative for his review

SECTION 01043 - COORDINATION WITH OWNER'S OPERATIONS

as a part of the construction schedule defined within Section 01310. The schedule shall indicate all periods and duration of each proposed shutdown and the items of work which will be accomplished. The Contractor shall make specific written requests for all shutdowns fourteen (14) calendar days in advance of the proposed shutdown for review and approval by the District Representative. If, in the opinion of the District Representative, the Contractor's proposed plan is insufficient to successfully complete the required work during the period of the shutdown, the Contractor shall make the appropriate revisions in his proposed plan to the satisfaction of the District Representative. The District reserves the right, at its sole discretion, to cancel any planned shutdown at any time for safety or operational reasons. A canceled shutdown will not constitute the basis for an increase in compensation due the Contractor.

- E. All water services shall remain in service for the duration of construction except when performing reconnections and tie-ins. Only one PRS may be taken out of service at a time. For work in Gardendale Rd, the existing Gardendale PRS may only be out of service between October 1st through April 30th, unless otherwise approved by Owner. The maximum allowable shutdown duration for each PRS shall be 7 consecutive weeks.

1.4 SEQUENCE OF CONSTRUCTION

- A. Work under the Contract shall be scheduled and performed in such a manner as to result in the least possible disruption to the operation of the existing District facilities and to the general public. The Contractor shall coordinate all connections to existing mains with the Owner.
- B. The construction constraints and requirements identified below and throughout this section must be used as a guideline in preparing the scheduling. At the sole discretion of the District Representative, deviation from these suggested sequences is permitted if techniques and methods known to the Contractor will result in reducing the disruption of the facility operation and upon the concurrence of the District Representative.
 - 1. Potholing shall be performed at least two (2) weeks in advance of construction at each PRS location.
- C. Phasing of Work Guidelines. The following guidelines shall be used by the Contractor for the scheduling and performance of the Work. Deviations from these guidelines shall be submitted to the Owner per OMWD Standard Specification Section 01300 and shall not be carried out until written approval is obtained from the Owner. The Work shall be completed in two Phases.
 - 1. General - The following work shall precede the Work of any given phase.
 - a. Field stake the alignments and notify DigAlert for field mark out of all existing utilities that are crossing or paralleling (within 5 feet horizontally) of the proposed construction.

SECTION 01043 - COORDINATION WITH OWNER'S OPERATIONS

- b. A minimum of two (2) weeks prior to start of excavation, pothole all existing utilities that are crossing or paralleling (within 5 feet horizontally) of the proposed pipeline including connection points to existing pipelines and as defined on the Drawings. Provide potholing results to the Owner and inform of any discrepancies at connection points, or at crossing or paralleling utilities, and allow sufficient time for District to make adjustments to the vertical and horizontal alignments, where necessary.
2. Only one of the two project PRS may shutdown at a time. Before each shutdown, the Contractor shall obtain shutdown plan and schedule approval from the Owner, have all regulatory agency approvals in hand, and have all necessary and required equipment and materials to complete the work in hand or in route.
3. Whichever existing PRS is taken out of service and demolished, the replacement PRS must be in service and fully functional prior to taking the second PRS out of service.

END OF SECTION

(BLANK)

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 GENERAL

- A. The Section includes all cutting and patching of all Work under construction, completed Work and existing facilities in order to accommodate the coordination of Work, install other Work, uncover Work for access, inspection or testing, or similar purposes. Execute all cutting and patching, including excavation, backfill and fitting required to:
1. Remove and replace defective Work or Work not conforming to requirements of the Contract Documents.
 2. Remove samples of installed Work as required for testing.
 3. Remove all construction required to provide for specified alteration or addition to existing Work.
 4. Uncover Work to provide for the Engineer's inspection of covered Work or inspection by regulatory agencies having jurisdiction.
 5. Connect to completed Work that was not accomplished in the proper sequence.
 6. Remove or relocate existing utilities and pipes which obstruct the Work to which connections must be made.
 7. Make connections or alterations to existing or new facilities.
- B. Restore all existing Work to a state equal to that which it was in prior to cutting and restore new Work to the standards of these Specifications.
- C. Submittals:
1. Prior to cutting which may affect integrity and design function of Project, Owner's operations, or work of another contractor, submit written notice to Engineer, requesting consent to proceed with cutting, including:
 - a. Identification of Project.
 - b. Description of affected Work of Contractor and work of others.
 - c. Necessity for cutting.
 - d. Effect on other work and on structural integrity of Project.
 - e. Description of Proposed Work. Designate:
 - 1) Scope of cutting and patching.
 - 2) Contractor, Subcontractor or trade to execute Work.

SECTION 01045 - CUTTING AND PATCHING

- 3) Products proposed to be used.
 - 4) Extent of refinishing.
 - 5) Schedule of operations.
- f. Alternatives to cutting and patching, if any.
 - g. Designation of party responsible for cost of cutting and patching.
2. Should conditions of Work, or schedule, indicate change of materials or methods, submit written recommendation to Engineer, including:
 - a. Conditions indicating change.
 - b. Recommendations for alternative materials or methods.
 - c. Submittals as required for substitutions.
 3. Submit written notice to Engineer, designating time Work will be uncovered, to provide for observation. Do not begin cutting or patching operations until authorized by the Engineer.
- D. Provide shoring, bracing and support as required to maintain structural integrity of Project and protect adjacent Work from damage during cutting and patching.
 - E. Conform to all applicable Specifications for application and installation of materials used for patching.

END OF SECTION

SECTION 01070 – ABBREVIATIONS AND SYMBOLS

PART 1 - GENERAL

1.1 ABBREVIATIONS

- A. Interpret abbreviations used on the Contract Documents as defined in ANSI Y1.1.

1.2 ORGANIZATION ABBREVIATIONS

- A. Abbreviations of organizations that may be used in these Specifications are:

AASHTO	American Association of State Highway and transportation Officials
ACS	American Chemical Society
ACI	American Concrete Institute
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineer
AIChE	American Institute of Chemical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APCD	Air Pollution Control District
APHA	American Public Health Association
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASA	American Standard Association (now ANSI)
ASTM	American Society for Testing and Materials
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
AWS	American Welding Society
AWWA	American Water Works Association
DDW	SWRCB Division of Drinking Water
DIPRA	Ductile Iron Pipe Research Association
CALOSHA	California Occupational Safety and Health Association
CALTRANS	State of California Department of Transportation
CBC	California Building Code
CDFG	California Department of Fish and Game

SECTION 01070 – ABBREVIATIONS AND SYMBOLS

CEQA	California Environmental Quality Act
CRSI	Concrete Reinforcing Steel Institute
CRWQCB	California Regional Water Quality Control Board
EBE	Emerging Business Enterprise
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FM	Factory Mutual
HEW	Department of Health, Education and Welfare
HUD	Department of Housing and Urban Development
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronic Engineers
IRI	Industrial Risk Insurance
ISO	Insurance Services Office
NAAMM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NARUC	National Association of Railroad and Utilities Commissioners
NBFU	National Board of Fire Underwriters
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NEPA	National Environmental Policy Act
NF	National Fire Protection Association
NPDES	National Pollution Discharge Elimination System
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Act
OMWD	Olivenhain Municipal Water District
PCA	Portland Cement Association
PCI	Precast Concrete Institute
SDRS	San Diego Regional Standards
SMACNA	Sheet Metal and Air Conditioning National Association
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Council
SWRCB	State Water Resources Control Board
UL or U/L	Underwriters Laboratories, Inc.
USACE	United States Army Corp of Engineers
USASI	United States of American Standard Institute (now ANSI)
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USPHS	United States Public Health Service
WAS	Water Agencies' Standard
WWEMA	Water and Wastewater Equipment Manufacturers Association
WPCF	Water Pollution Control Federation

SECTION 01070 – ABBREVIATIONS AND SYMBOLS

1.3 LEGEND

- A. Legends of symbols used are shown on the contract drawings, and in general, use of symbols is confined to the contract drawings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

(BLANK)

SECTION 01080 - DEFINITIONS

PART 1 - GENERAL

1.1 PURPOSE

- A. Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof.

1.2 DEFINITIONS

- A. ADDENDA - Written or graphic instruments issued prior to the opening of Bids that make additions, deletions, or revisions to the Contract Documents.
- B. AGREEMENT - The written contract between the Owner and the Contractor covering the Work to be performed; other documents are attached to the Agreement and made a part thereof as provided therein.
- C. APPLICATION FOR PAYMENT (PROGRESS ESTIMATE AND PAYMENT FORM) - The form furnished by the Construction Manager which is to be used by the Contractor to request progress or final payment and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
- D. BID - The offer or proposal of the Bidder submitted on the prescribed form setting forth the price or prices for the Work.
- E. BONDS - Bid, Performance, and Payment Bonds and other instruments that protect against loss due to inability or refusal of the Contractor to perform its Contract.
- F. CHANGE ORDER - A document recommended by the Construction Manager, which is signed by the Contractor and the Owner and authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.
- G. CONSTRUCTION MANAGER - The individual, partnership, corporation, joint venture or other legal entity named as such by written notice from the Owner.
- H. CONTRACT DOCUMENTS - The Notice Inviting Bids, Instructions to Bidders, Bid Forms (including the Bid, Bid Schedule(s), Information Required of Bidder, Bid Bond, and all required certificates and affidavits), Agreement, Performance Bond, Payment Bond, General Conditions, Supplementary General Conditions, Technical Specifications, Drawings, and all addenda, and change orders executed pursuant to the provisions of the Contract Documents.
- I. CONTRACT PRICE - The total monies payable by the Owner to the Contractor under the terms and conditions of the Contract Documents.
- J. CONTRACT TIME - The number of successive calendar days stated in the Contract Documents for the completion of the Work.
- K. CONTRACTOR - The individual, partnership, corporation, joint venture or other legal entity with whom the Owner has executed the Agreement.

SECTION 01080 - DEFINITIONS

- L. DAY - A calendar day of 24 hours measured from midnight to the next midnight.
- M. DEFECTIVE WORK - Work that is unsatisfactory, faulty, or deficient; or that does not conform to the Contract Documents; or that does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents; or Work that has been damaged prior to the Construction Manager's recommendation of final payment.
- N. DESIGN CONSULTANT - The individual, partnership, corporation, joint venture or other legal entity named as such in the Contract Documents.
- O. DRAWINGS - The drawings, plans, maps, profiles, diagrams, and other graphic representations which indicate the character, location, nature, extent, and scope of the Work and which have been prepared by the Design Consultant and are referred to in the Contract Documents. Shop Drawings are not Drawings as so defined.
- P. EFFECTIVE DATE OF THE AGREEMENT - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
- Q. ENGINEER - Wherever the word "Engineer" is found in these Contract Documents or in any referenced document, it shall mean the Construction Manager.
- R. FIELD ORDER - A written order issued by the Construction Manager that does not involve a change in the Work.
- S. GENERAL REQUIREMENTS - Division 1 of the Technical Specifications.
- T. HAZARDOUS WASTE - As defined in Section 25117 of the Health and Safety Code, which is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law, whichever is more restrictive.
- U. LAWS AND REGULATIONS; LAWS OR REGULATIONS - Any and all applicable laws, rules, regulations, ordinances, codes, and/or orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.
- V. MECHANIC'S LIEN - A form of security, an interest in real property which is held to secure the payment of an obligation. When referred to in these Contract Documents, "Mechanic's Lien" or "lien" means "Stop Notice".
- W. MILESTONE - A principal event specified in the Contract Documents relating to an intermediate completion date of a portion of the Work, or a period of time within which the portion of the Work should be performed prior to Substantial Completion of all the Work.
- X. NOTICE OF AWARD - The written notice by the Owner to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein within the time specified, the Owner will enter into an Agreement.

SECTION 01080 - DEFINITIONS

- Y. NOTICE OF COMPLETION - A form signed by the Design Consultant, the Construction Manager and the Contractor recommending to the Owner that the Work is Substantially Complete and fixing the date of Substantial Completion. After acceptance of the Work by the Owner's governing body, the form is signed by the Owner and filed with the County Recorder. This filing starts the 60-day lien-filing period on the Work.
- Z. NOTICE TO PROCEED - The written notice issued by the Owner to the Contractor authorizing the Contractor to proceed with the Work and establishing the date of commencement of the Contract Time.
- AA. OWNER – The Owner shall be Olivenhain Municipal Water District, 1966 Olivenhain Road, Encinitas, CA 92024, acting through its legally designated officials, officers, or employees.
- AB. PARTIAL UTILIZATION - Use by the Owner of a substantially completed part of the Work for the purpose for which it is intended prior to Substantial Completion of all the Work.
- AC. PROJECT - The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.
- AD. RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the Construction Manager who is assigned to the site or any part thereof.
- AE. SHOP DRAWINGS - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the Contractor and submitted by the Contractor to illustrate some portion of Work and all illustrations, brochures, standard schedules, performance charts, instructions, and diagrams to illustrate material or equipment for some portion of the Work.
- AF. SPECIFICATIONS - (Same definition as for Technical Specifications hereinafter).
- AG. STOP NOTICE - A legal remedy for subcontractors and suppliers who contribute to public works, but who are not paid for their work, which secures payment from construction funds possessed by the Owner.
- For public property, the Stop Notice remedy is designed to substitute for mechanic's lien rights.
- AH. SUB-CONSULTANT - The individual, partnership, corporation, joint-venture or other legal entity having a direct contract with Design Consultant, the Construction Manager or with any of their Consultants to furnish services with respect to the Project and who is identified as such in the Supplementary General Conditions.
- AI. SUBCONTRACTOR - An individual, partnership, corporation, joint-venture or other legal entity having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the site.

SECTION 01080 - DEFINITIONS

- AJ. SUBSTANTIAL COMPLETION - Refers to when the Work has progressed to the point where, in the opinion of the Construction Manager as evidenced by Notice of Completion as applicable, it is sufficiently complete, in accordance with the Contract Documents, so that the Work can be utilized for the purposes for which it is intended; or if no such notice is issued, when final payment is due in accordance with General Provisions 9-3. The terms "substantially complete" and "substantially completed" as applied to any work refer to substantial completion thereof.
- AK. SUPPLEMENTARY GENERAL CONDITIONS - The part of the Contract Documents that make additions, deletions, or revisions to these General Conditions.
- AL. SUPPLIER - A manufacturer, fabricator, supplier, distributor, materialman, or vendor.
- AM. TECHNICAL SPECIFICATIONS - Divisions 1 through 17 of the Contract Documents consisting of the General Requirements and written technical descriptions of products and execution of the Work.
- AN. UTILITIES - All pipelines, conduits, ducts, cables, wires, tracks, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities which have been installed underground or above the ground to furnish any of the following services or materials: water, sewage and drainage removal, electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, traffic, or other control systems.
- AO. WORK - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing, or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.
- AP. GOVERNING BODY - Owner's Board of Directors.

END OF SECTION

SECTION 01090 - REFERENCE STANDARDS

PART 1 - GENERAL

1.1 GENERAL

- A. Applicable Publications: Whenever in these specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Work is advertised for bids shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the drawings shall be waived because of any provision of, or omission from, said standards or requirements.
- B. When a reference standard is specified, comply with requirements and recommendations stated in that standard, except when they are modified by the Contract Documents, or when applicable laws, ordinances, rules, regulations or codes establish stricter standards. The latest provisions of applicable standards shall apply to the Work.
- C. Reference standards include, but are not necessarily limited to, the following:
1. American Association of State Highway and Transportation Officials.
 2. American Concrete Institute.
 3. American Gear Manufacturers Association.
 4. American Institute of Steel Construction.
 5. American Iron and Steel Institute.
 6. American National Standards Institute.
 7. American Society of Heating, Refrigerating and Air Conditions Engineers.
 8. American Society of Mechanical Engineers.
 9. American Society for Testing and Materials.
 10. American Water Works Association.
 11. American Welding Society.
 12. City of Encinitas Standard Drawings
 13. Concrete Reinforcing Steel Institute.
 14. Factory Mutual Association.
 15. Institute of Electrical and Electronics Engineers.

SECTION 01090 - REFERENCE STANDARDS

16. National Electrical Manufacturer's Association
17. National Fire Protection Association.
18. Prestressed Concrete Institute.
19. Underwriter's Laboratories, Inc.
20. Standard Specifications for Public Works Construction (SSPWC), Current Edition (Greenbook).
21. San Diego Area Regional Standard Drawings, Current Edition
22. State of California, Department of Transportation Standard Specifications (Standard Specifications), Current Edition.
23. All other applicable standards listed in the Specifications, and the standards of utility service companies, where applicable.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Without limiting the generality of other requirements of the specifications, all Work specified herein shall conform to or exceed the requirements of all applicable codes and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of these Specifications nor the applicable codes.
- B. References herein to "Building Code" or CBC shall mean the California Building Code. The latest edition of the code as approved and used by the local agency as of the date of award, as adopted by the agency having jurisdiction, shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto. The CBC is hereby incorporated in and made a part of these Contract Documents, to the extent of the applicable references thereto.
- C. No provisions of any referenced standard specification, manual or code, whether or not specifically incorporated by reference in the Contract Documents, shall be effective to change the duties and responsibilities of the Owner, Engineer, or Contractor from those set forth in the Contract Documents. Nor shall they be effective to assign to the Engineer any duty of authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.
- D. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflict shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or labor. The Contractor shall bid the most stringent requirements.
- E. Applicable Standard Specifications: The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents

SECTION 01090 - REFERENCE STANDARDS

and the referenced portions of those referenced codes, standards, and specifications listed herein.

- F. References herein to "SSPWC" or "Green Book" shall mean "Standard Specifications for Public Works Construction," latest edition, including the County of San Diego Regional and City of San Diego Supplement Amendments.
- G. References to "Standard Drawings" shall mean the "San Diego Area Regional Standard Drawings, Current Edition" including all current supplements, addenda, and revisions thereof.
- H. Reference herein to "OMWD Standard Specifications" shall mean the "Olivenhain Municipal Water District Standard Specifications" dated February 2017, and including all current supplements, addenda, and revisions thereof. The specifications and standard drawing details contained in these Contract Documents shall take precedence over the "OMWD Standard Specifications".
- I. References herein to "Cal-OSHA" shall mean State of California, Department of Industrial Relations, Construction Safety Orders, as amended to date, and all changes and amendments thereto which are effective as of the date of construction.
- J. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- K. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

1.3 TRADE NAMES AND ALTERNATIVES

- A. For convenience in designation in the Contract Documents, 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 alternative material which is equivalent in quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:
 - 1. The burden of proof as to the quality and suitability of such alternative equipment, products, or other materials shall be upon the Contractor.
 - 2. The Engineer will be the sole judge as to the comparative quality and suitability of such alternative equipment, products, or other materials and its decision shall be final.
- B. Wherever in the Contract Documents the name or the name and address of a manufacturer or distributor is given for a product or other material, or if any other source of a product or material is indicated therefore, such information is given for the convenience of the Contractor only, and no limit, restriction, or direction is indicated or intended thereby, nor is the accuracy or reliability of such information guaranteed. It shall be the responsibility of the Contractor to determine the

SECTION 01090 - REFERENCE STANDARDS

accurate identity and location of any such manufacturer, distributor, or other source of any product or material called for in the Contract Documents.

- C. The Contractor may offer any material, process or equipment which it considers equivalent to that indicated. Unless otherwise authorized in writing by the Engineer, submission of data substantiating a request for a substitution of "an equal" item shall be submitted after bid opening and prior to 60 days after award of the Contract. The Contractor, at its sole expense, shall furnish data concerning items it has offered as equivalent to those specified. The Contractor shall provide any materials as required by the Engineer to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the items will fulfill its intended function.

Installation and use of a substitute item shall not be made until approved by the Engineer. If a substitute offered by the Contractor is found to be not equivalent to the specified material, the Contractor shall furnish and install the specified material.

- D. The Contractor's attention is further directed to the requirement that its failure to submit data substantiating a request for a substitution of an "equivalent" item within said period prior to and after the award of the contract, shall be deemed to mean that the Contractor intends to furnish one of the specific brand-named products named in the specification, and the Contractor does hereby waive all rights to offer or use substitute products in each such case. Wherever a proposed substitute product has not been submitted within said period, or wherever the submission of a proposed substitute product fails to meet the requirements of the specifications and an acceptable resubmittal is not received by the Engineer within said period, the Contractor shall furnish only one of the products originally named in the Contract Documents.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

SECTION 01150 – MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The items described below in Paragraph 1.4 - Pay Items refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant, services, Contractor's or Engineer's field offices, layout surveys, job signs, sanitary requirements, testing, safety devices, shop drawings, record drawings, water supplies, power, maintaining traffic, removal of waste, watchmen, bonds, insurance, and all other requirements of the Contract Documents. Compensation for all such services, materials, and items shall be included in the prices stipulated for the lump sum or unit price pay items listed herein.
- B. The lump sum bid prices and unit cost bid prices will be deemed to include an amount considered by the Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

1.2 SCOPE

- A. Payment shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies and manufactured articles and for all labor, operations and incidentals that are appurtenant to the items of Work and necessary to complete the various items of Work in accordance with the requirements of the Contract Documents. This shall include all appurtenances and the costs 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).
- B. Payment shall include all measures necessary to comply with all applicable State and Federal requirements for handling, transporting and disposal of asbestos containing materials (i.e., asbestos cement) including special handling these materials in a manner that will preclude their classification as regulated asbestos containing material and worker protection to reduce health and safety risks resulting from exposure to asbestos containing materials.

1.3 BREAKDOWN OF CONTRACT PRICE

A. Lump Sum

- 1. Prior to the execution of a lump sum contract, the Contractor shall submit a detailed price breakdown showing the allocated portion of the total bid price to the various items of Work. Contractor must submit a preliminary price breakdown for the review and approval of the Engineer. The Owner reserves the right to reject any breakdown submitted by the Contractor which the Owner judges insufficient to allow for the preparation of accurate monthly progress payment estimates or extra work similar in nature to the Work included in the Contractor's bid. The detailed price breakdown shall be listed by specification section number and shall include a separate cost item for all items of equipment or work. The

SECTION 01150 – MEASUREMENT AND PAYMENT

price breakdown shall typically be a unit price type breakdown and shall include quantities, unit prices and total bid cost for each cost item. Where a unit price breakdown is judged impractical, the Owner may allow a breakdown by lump sum for certain cost items. This information will be used by the Owner in preparing monthly progress payment estimates.

1.4 PIPELINE PAY ITEMS

- A. The following requirements, as applicable, shall apply to pipeline pay items listed in this Section, with the additional requirements listed under each pay item. Payment shall include, but is not limited to, field surveying and staking; pavement saw cutting; excavation; demolition and removal of abandoned structures from within excavations; surplus material disposal; recessed trench plating; imported bedding and backfill material and compaction; pipe and fittings; concrete thrust blocks and/or restraint devices; isolation valves; polyethylene encasement; valve stem extensions; valve wells and covers; tubing; corporation stops; linings and coatings for metallic pipe; cathodic protection anodes and test stations; temporary highlining; connections to existing pipelines; abandonment of existing pipelines; removal and replacement of vegetation or trees; record of survey and replacement of monuments; traffic control services, equipment or permits not included in any other bid item; subgrade preparation and compaction; aggregate base; temporary asphalt concrete pavement; pressure testing; disinfection (of potable water pipelines); site restoration and replacement of existing improvements including curbs, gutters, medians, driveways, sidewalks, retaining and block walls, landscaping, and irrigation; and all incidental work, complete in place, in accordance with the Contract Documents. No adjustment to the Contract Price will be made for variations in trench width, pavement removal width, pavement material, or pavement thickness.

The pipeline payment shall also include, but not be limited to, furnishing all labor, materials, tools, and equipment and performing all work required for restoration of pavement striping and markings and traffic detector loops to existing conditions.

The pipeline payment shall also include, but not be limited to, furnishing all labor, materials, tools, and equipment and performing all work required for over-excavation, placement of fabric in accordance with product manufacturer's recommendations, and placement of crushed rock below the design trench subgrade elevation in accordance with the Contract Documents.

In accordance with Article 9-2 PROGRESS PAYMENT of the General Provisions no allowance shall be made for materials delivered but not installed, unless otherwise approved in writing by the Owner.

1.5 PAY ITEMS

- A. SCHEDULE A for Village Park West PRS
A.1. Mobilization, Demobilization, Bonds, Permits, and Insurance

Payment shall include compensation for all labor, materials, tools and equipment including, but not limited to, the following principal items: obtaining and complying

SECTION 01150 – MEASUREMENT AND PAYMENT

with permits not included in any other bid item; mobilizing labor force, equipment and construction facilities; providing Contractor field offices and storage yard; securing construction water supply; providing all temporary construction fencing and safety barriers; providing on-site sanitary facilities; obtaining groundwater discharge permits or waivers; posting OSHA requirements and establishing safety programs; daily cleanup; preparing the Schedule of Values prior to the pre-construction meeting; preconstruction/progress video and photographs, per 1.30 of the Special Provisions, covering the entire project site prior to mobilization; work not specified for payment in any other bid item; and all incidentals for the mobilization, demobilization, and permitting for construction of the project as described in the Contract Documents.

Payment shall also include bonds, insurance (including the City of Encinitas as additional insured with \$1,000,000 coverage limits), permit applications and fees for City of Encinitas Right-of-Way Construction Permit and Traffic Control Permit and incidentals thereto to construct the project in its entirety in accordance with the Contract Documents. City of Encinitas construction inspection fees will be paid for by the Owner. Earthquake & Tidal Wave Insurance is not required.

Payment for this item shall be limited to five (5) percent of the total contract price for bid Schedule A.

A-2. Dewatering

Payment for dewatering for each Pipeline Segment shall include, but is not limited to, all labor, materials, tools, equipment, supplies, supervision, and incidentals required for obtaining groundwater discharge permit(s) and performing dewatering as necessary to complete the Work in accordance with the Contract Documents. Payment for this bid item shall include compliance with the Regional Water Quality Control Board (RWQCB) requirements for groundwater discharge to the environment including, but not limited to, sampling, volumetric measurement, temporary containment, treatment, testing for clarity and constituents as required, monitoring and reporting. Payment shall include all coordination, submittals, insurance, construction means and methods, and incidentals to comply with RWQCB requirements.

A-3. Village Park West PRS Installation

Payment shall include all labor, materials, tools, equipment and incidentals required to retrieve, transport, and install the Owner purchased EFI PRS unit including surface demolition, excavation and shoring, construction of the PRS foundation, piping and appurtenances, catch basin and curb outlet, retaining wall, vent piping, hatch drain piping, PRS and pipeline cathodic protection, conformance testing, startup testing, and all other costs to make system functional per contract.

Payment shall include all labor, materials, tools, equipment, and incidentals required to install new magnesium anodes, test boxes, anode leads, and pipe leads as specified in the contract documents and OMWD Standard Specification 15310.

A-4. Piping, connections, and abandonments

SECTION 01150 – MEASUREMENT AND PAYMENT

Payment shall include all labor, materials, tools, equipment and incidentals required to install 8" DI and 10" DI pipelines in Wandering Rd, demolish and fill the existing PRS, remove conflicting portions of existing pipe, connect to the EFI PRS, and to tie-back into the existing system.

A-5. Site and Surface Restoration

Payment for Surface Restoration shall include, but not be limited to, furnishing all labor, materials, tools and equipment necessary for the surface restoration of pavement, concrete cross-gutter, curb and gutter, and new continental sidewalk that are disturbed as a result of the installation of PRS, Pipelines, appurtenances, pipeline removal or abandonment, or as a result of Contractor's operations for work in Wandering Rd and Mountain Vista Dr; and all other incidental work necessary to complete this item of work in its entirety in accordance with the Contract Documents.

Payment shall also include all labor, materials, tools, equipment, and incidentals required to remove existing curb ramps and associated concrete, and install two curb ramps at Wandering Rd.

Asphalt concrete pavement saw cutting, removal, disposal, restoration and restriping shall be in accordance with the City of Encinitas Standard Drawings, revised October 2023.

A-6. Potholing

Payment for potholing for each Pipeline Segment shall include full compensation for all labor, materials, tools, equipment and incidentals for the potholing of utilities two (2) weeks in advance of the Village Park West PRS and piping installation that join, cross, or parallel the work (within 5 feet) prior to construction including surveying and staking, excavation, shoring, bracing, backfill, site restoration and incidental work necessary to verify the sizes, material types, elevations, inclinations and bearings of existing utilities within the work areas whether shown on the plans or located in the field in accordance with the Contract Documents. Potholing shall be conducted for the proposed pipelines and lateral piping for appurtenances. Potholing of existing utilities that parallel the proposed pipelines shall be conducted at an interval sufficient to establish their locations with respect to the centerline of the proposed construction. Payment for this bid item shall include costs for traffic control, permits and related drawings for potholing activities that are not included in any other bid item, if necessary, prepared to the satisfaction of the governing jurisdiction.

A-7 Traffic Control

Payment for traffic control shall include all work associated with temporary traffic control as approved by the City of Encinitas. The work associated with the bid item for traffic control shall include, but not limited to, preparing stamped and signed traffic control drawings, obtaining a traffic control permit from the City of Encinitas, furnishing all labor (including flagging costs), materials (including construction area signs, K-rails, and fencing), temporary striping, trench plating, tools, and equipment.

SECTION 01150 – MEASUREMENT AND PAYMENT

B. SCHEDULE B for Gardendale PRS

B-1. Mobilization, Demobilization, Bonds, Permits, and Insurance

Payment shall include compensation for all labor, materials, tools and equipment including, but not limited to, the following principal items: obtaining and complying with permits not included in any other bid item; mobilizing labor force, equipment and construction facilities; providing Contractor field offices and storage yard; securing construction water supply; providing all temporary construction fencing and safety barriers; providing on-site sanitary facilities; obtaining groundwater discharge permits or waivers; posting OSHA requirements and establishing safety programs; daily cleanup; preparing the Schedule of Values prior to the pre-construction meeting; preconstruction/progress video and photographs covering the e project site prior to mobilization; work not specified for payment in any other bid item; and all incidentals for the mobilization, demobilization, and permitting for construction of the project as described in the Contract Documents.

Payment shall also include bonds, insurance (including the City of Encinitas as additional insured with \$1,000,000 coverage limits), permit applications and fees for City of Encinitas Right-of-Way Construction Permit and Traffic Control Permit and incidentals thereto to construct the project in its entirety in accordance with the Contract Documents. City of Encinitas construction inspection fees will be paid for by the Owner. Earthquake & Tidal Wave Insurance is not required.

Payment for this item shall be limited to five (5) percent of the total contract price for bid Schedule B.

B-2. Dewatering

Payment for dewatering for each Pipeline Segment shall include, but is not limited to, all labor, materials, tools, equipment, supplies, supervision, and incidentals required for obtaining groundwater discharge permit(s) and performing dewatering as necessary to complete the Work in accordance with the Contract Documents. Payment for this bid item shall include compliance with the Regional Water Quality Control Board (RWQCB) requirements for groundwater discharge to the environment including, but not limited to, sampling, volumetric measurement, temporary containment, treatment, testing for clarity and constituents as required, monitoring and reporting. Payment shall include all coordination, submittals, insurance, construction means and methods, and incidentals to comply with RWQCB requirements.

B-3. Gardendale PRS Installation

Payment shall include all labor, materials, tools, equipment and incidentals required to retrieve, transport, and install the Owner purchased EFI PRS unit including surface demolition, excavation and shoring, construction of the PRS foundation, piping and appurtenances, catch basin and curb outlet, retaining wall, vent piping, hatch drain piping, PRS and pipeline cathodic protection, conformance testing, startup testing, and all other costs to make system functional per contract.

SECTION 01150 – MEASUREMENT AND PAYMENT

Payment shall include all labor, materials, tools, equipment, and incidentals required to install new magnesium anodes, test boxes, anode leads, and pipe leads as specified in the contract documents and OMWD Standard Specification 15310.

B-4. Piping, connections, and abandonments

Payment shall include all labor, materials, tools, equipment, and incidentals required to install 14" DI pipeline, electrical conduit, demolish and fill the existing PRS, remove conflicting portions of existing pipe, connect to the EFI PRS, and to tie-back into the existing system.

B-5. Site and Surface Restoration

Payment for Surface Restoration shall include, but not be limited to, furnishing all labor, materials, tools and equipment necessary for the surface restoration of pavement, concrete cross-gutter, curb and gutter, and sidewalk that are disturbed as a result of the installation of PRS, Pipelines, appurtenances, pipeline removal or abandonment, or as a result of Contractor's operations for work in Gardendale Rd; and all other incidental work necessary to complete this item of work in its entirety in accordance with the Contract Documents.

Asphalt concrete pavement saw cutting, removal, disposal, restoration and restriping shall be in accordance with the City of Encinitas Standard Drawings, revised October 2023 and Trench Cut Moratorium Policy.

B-6. Potholing

Payment for potholing for each Pipeline Segment shall include full compensation for all labor, materials, tools, equipment and incidentals for the potholing of utilities two (2) weeks in advance of the Gardendale PRS and piping installation that join, cross, or parallel the work (within 5 feet) prior to construction including surveying and staking, excavation, shoring, bracing, backfill, site restoration and incidental work necessary to verify the sizes, material types, elevations, inclinations and bearings of existing utilities within the work areas whether shown on the plans or located in the field in accordance with the Contract Documents. Potholing shall be conducted for the proposed pipelines and lateral piping for appurtenances. Potholing of existing utilities that parallel the proposed pipelines shall be conducted at an interval sufficient to establish their locations with respect to the centerline of the proposed construction. Payment for this bid item shall include costs for traffic control, permits and related drawings for potholing activities that are not included in any other bid item, if necessary, prepared to the satisfaction of the governing jurisdiction.

B-7. Traffic Control

Payment for traffic control shall include all work associated with temporary traffic control as approved by the City of Encinitas. The work associated with the bid item for traffic control shall include, but not limited to, preparing stamped and signed traffic control drawings, obtaining a traffic control permit from the City of Encinitas, furnishing all labor (including flagging costs), materials (including construction area

SECTION 01150 – MEASUREMENT AND PAYMENT

signs, K-rails, and fencing), temporary striping, trench plating, tools, and equipment.

END OF SECTION

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SECTION 01201 - PRECONSTRUCTION CONFERENCE

PART 1 - GENERAL

1.1 GENERAL

- A. Date, Time and Location: Conference will be held after execution of the Contract and before construction is started at the site. Owner's Representative will fix the date, time and location of the meeting in accordance with requirements of the General Conditions.
- B. Owner's Representative shall prepare agenda, preside at meeting, and prepare and distribute a transcript of proceedings to all parties.
- C. Contractor(s) shall provide any data requested by the Owner or required by the Contract Documents, contribute appropriate items for discussion, and be prepared to discuss all items on agenda. Construction schedule and schedule or values are required to be submitted prior to or at the Conference unless otherwise agreed to in writing by the Owner.

1.2 REQUIRED ATTENDANCE

- A. Contractor(s) and major Subcontractors.
- B. Owner's representative.
- C. Representatives of government agencies having any degree of control or responsibility, if available.

1.3 AGENDA

- A. Agenda will include, but will not necessarily be limited to, the following:
 - 1. Designation of responsible personnel.
 - 2. Subcontractors.
 - 3. Coordination with other contractors.
 - 4. Coordination with SDG&E or other utility companies
 - 5. Construction schedule.
 - 6. Processing of Shop Drawings.
 - 7. Processing of field decisions and Change Orders.
 - 8. Requirements for copies of Contract Documents.
 - 9. Insurance in force.
 - 10. Schedule of Values.

SECTION 01201 - PRECONSTRUCTION CONFERENCE

11. Schedule of Payments.
12. Use of premises.
13. Contractor(s) responsibility for safety and first aid procedures.
14. Security.
15. Housekeeping.
16. Field Offices.
17. Record Drawings.
18. Staging
19. Communications
20. Contacts
21. All items listed in the Contract Documents that have been identified for discussion during pre-construction conference.

END OF SECTION

SECTION 01202 - PROGRESS MEETINGS

PART 1 - GENERAL

1.1 GENERAL

- A. During performance of the Work, bi-weekly meetings shall be convened at a day and time as mutually agreed upon by the Owner's Representative and Contractor. When no construction Work is being performed, meetings shall be held as appropriate and as mutually agreed upon by the Owner's Representative and Contractor.
- B. Meetings shall be convened at the District office at the project site or other as otherwise approved by the District.
- C. The Owner's representative shall prepare agenda, preside at meetings, and prepare and distribute a transcript of proceedings to all parties.
- D. Contractor shall provide data required and be prepared to discuss all items on agenda.

1.2 MINIMUM ATTENDANCE

- A. Contractor and Owner's representative.
- B. Subcontractors and suppliers as appropriate or as mutually agreed upon.
- C. Others as appropriate.
- D. Representatives present for each party shall be authorized to act on their behalf.

1.3 AGENDA

- A. Agenda will include, but will not necessarily be limited to, the following:
 - 1. Transcript of previous meeting.
 - 2. 3-week lookahead.
 - 3. Safety.
 - 4. Progress since last meeting.
 - 5. Planned progress for next period.
 - 6. Problems, conflicts and observations.
 - 7. Change Orders and Potential Change Orders.
 - 8. Applications for payment.
 - 9. Quality standards and control.

SECTION 01202 - PROGRESS MEETINGS

10. Schedules, including off-site fabrication and delivery schedules. Corrective measures required.
11. Coordination between parties.
12. Other business.
13. Other correspondence

END OF SECTION

SECTION 01310 – PROGRESS SCHEDULES

PART 1 – GENERAL

- A. The Contractor shall provide a construction schedule which conforms to the requirements below, unless otherwise approved by the Engineer.

1.1 SECTION INCLUDES

- A. Format.
- B. Content.
- C. Revisions to schedules.
- D. Submittals.

1.2 RELATED SECTIONS

- A. Section 01010: Summary of Work
- B. Section 01043: Coordination with Owner's Operations
- B. Section 01150: Measurement and Payment
- C. Section 01720: Record Documents

1.3 FORMAT

- A. Prepare network analysis system using the critical path method, as outlined in The Associated General Contractors of America (AGC) publication "The Use of CPM in Construction - A Manual for General Contractors".
- C. Hard Copy: Sheet size shall be 11 inches by 17 inches.
- D. Electronic Copy: The latest project schedule shall be made available in MS Project format.
- E. Time Scale: Indicate first date in each work week.
- E. Organization:
 - 1. Group Shop Drawing submittals and reviews into a separate sub-schedule.
 - 2. Group product deliveries into a separate sub-schedule.
 - 3. Group construction Work into a separate sub-schedule by Bid Schedule and by activity within each Bid Schedule.

SECTION 01310 – PROGRESS SCHEDULES

4. Group critical activities which dictate the rate of progress into a separate sub-schedule.
5. Organize each subschedule by Specification Section number.

1.4 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by Specification Section number.
- C. Arrange construction Work into logically grouped activities for each Bid Schedule identified in Section 01150.
- D. Provide sub-schedules for each stage of Work identified in Section 01150, including dates for work in each street in each Bid Schedule per Sections 01043 and 01150.
- E. Provide sub-schedules to define critical portions of the entire Schedule.
- F. For work in each street in each Bid Schedule per Sections 01043 and 01150, provide the following details for any work that is to be performed outside the standard working hours:
 1. Dates when work during modified hours is planned.
 2. The number of consecutive days of work with modified hours.
 3. The frontage length of residential properties for segments near residential properties/subdivisions.
 4. Name any schools in the vicinity of the work.
 5. The nature of the work to be performed.
- G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- H. Provide separate schedule of submittal dates for Shop Drawings, product data, factory and field testing dates, and dates reviewed submittals will be required from the Engineer.
- I. Indicate delivery dates for any Owner furnished items.
- J. Coordinate content with Schedule of Values specified in Section 01370.

1.5 REVISIONS TO SCHEDULES

- A. Indicate progress of each activity to date of submittal, and projected completion date of each activity.

SECTION 01310 – PROGRESS SCHEDULES

- B. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- C. Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect including the effect of changes on schedules of separate contractors, if any.

1.6 SUBMITTALS

- A. Submit initial Schedules within 14 days after date of Notice to Proceed. After review, resubmit required revised data within ten days.
- B. Submit revised Progress Schedules monthly, or as directed by the Owner's Representative with the Progress Payment Form. Failure to submit an updated Progress Schedule will delay processing of Progress Pay Estimate until such time as a satisfactory Progress Schedule has been received and reviewed for adequacy by the Owner's Representative.
- C. Submit all documents electronically.
- D. Attach a letter of transmittal to each submittal and include the following information in the letter:
 - 1. A listing of items which have changed since the last submittal.
 - 2. Discussion of problems causing delays, anticipated length of delays, and proposed countermeasures.
- E. Three (3) week look ahead at each progress meeting.

1.7 DISTRIBUTION

- A. Distribute copies of reviewed Schedules to project site file, Subcontractors, suppliers, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Schedules.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

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SECTION 01370 – SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 GENERAL

- A. The Schedule of Values is an itemized list that establishes the value or cost of each part of the Work. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional Work or credits which may arise during the construction. Quantities and unit prices may be included in the schedule when approved by or required by the Owner's Representative.

1.2 PREPARATION

- A. Schedule shall show breakdown of labor, materials equipment and other costs used in preparation of the Bid.
- B. Costs shall be in sufficient detail to indicate separate amounts for each Section of the Specifications.
- C. Contractor may include an item for bond, insurance, temporary facilities and job mobilization. Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to the project site; for the establishment of all offices, buildings and other facilities necessary for Work on the project; and for all other Work and operations which must be performed or costs incurred prior to the beginning Work on the various contract items on the project site. Superintendent's salary shall be paid in equal monthly allocations over the duration of the job. Mobilization will be included for payment at a rate of 50 percent per month for the first two months.
- D. Schedule of Values shall be prepared on 8-1/2-inch by 11-inch white paper.
- E. Use Table of Contents of the Specifications as basis for Schedule format and identify each item with number and title in the Table of Contents. List sub-items of major products or systems as appropriate or when requested by Engineer.
- F. When requested by Engineer, support values with data that will substantiate their correctness.
- G. The sum of the individual values shown on the Schedule of Values must equal the total Contract Price.
- H. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
- I. In accordance with Article 9-2 PROGRESS PAYMENT of the General Provisions no allowance shall be made for materials delivered but not installed, unless otherwise approved in writing by the Owner.
- I.

SECTION 01370 – SCHEDULE OF VALUES

1.3 SUBMITTAL

- A. A tentative schedule of values shall be submitted prior to or at the pre-construction conference in accordance with Section 01201 of this specification.
- B. Submit three copies of the final schedule to the Owner's Representative for approval at least 20 days prior to submitting first application for a progress payment. After review by Owner's Representative, revise and resubmit schedule as required until it is approved.

END OF SECTION

SECTION 01400 – QUALITY CONTROL

PART 1 - GENERAL

1.1 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. The Contractor shall verify all dimensions in the field and shall check field conditions continuously during construction. The Contractor shall be solely responsible for any inaccuracies built into the Work due to its failure to comply with this requirement.
- B. The Contractor shall inspect related and appurtenant Work and shall report in writing to the Owner's Representative any conditions which will prevent proper completion of the Work. Failure to report any such conditions shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor at its sole cost and expense.
- C. Points of connections to any existing pipelines must be accurately located by the Contractor. Information such as vertical elevations, pipe outside diameters, joints, materials of construction, shape, and pipe conditions must be obtained prior to beginning Work in the affected area and this information shall be transmitted to the Owner's Representative. The Owner's Representative shall make any necessary adjustments to the Drawings to reflect the actual field conditions. No additional payments will be made to the Contractor for any required adjustments in the Drawings at the points of connection to existing pipelines. No payment will be allowed for special transition couplings or jointing materials required for connections to existing pipelines.

1.2 INSPECTION OF THE WORK

- A. The Work shall be conducted under the general observation of the Owner's Representative and shall be subject to inspection by representatives of the Owner to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, or field inspection, as required. The Owner's Representative shall be permitted access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.

1.3 SAMPLING AND TESTING

- A. At completion of the installation, the District shall perform conformance testing which includes pipe to soil voltage potential and anode output testing. Volt meter for the pipe to soil testing shall read 0.85 or higher and anode output voltage shall range between 1.53 and 1.55 volts. Any work found to be outside of acceptable range, shall be remedied immediately by the contractor, and in advance of any payment, and re-tested until within acceptable range. Contractor shall refer to OMWD Standard Section 15310 for additional performance and testing requirements.
- A. When not otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered; however, the Owner's Representative reserves the right to use any generally-accepted system of inspection which, in the opinion of the Owner's Representative will ensure that the quality of the workmanship is in full accord with the Contract Documents.

SECTION 01400 – QUALITY CONTROL

- B. Any waiver of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial Work, shall not be construed as a waiver of any technical or qualitative requirements of the Contract Documents.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

SECTION 01410 – TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 GENERAL

- A. The Owner will employ and pay for an independent testing laboratory to perform the specified services.
- B. Inspection, sampling and testing shall be as specified in the individual Sections. These include, but are not limited to:
 - 1. Section 02200: Earthwork
 - 2. Section 02743 - Asphalt Concrete Paving
 - 4. Section 03000: General Concrete Construction
- C. The Owner will pay for the testing listed above except for repeat testing which results from the Contractor's failure to meet Specification requirements.
- D. Contractor shall pay for:
 - 1. Tests not listed above.
 - 2. Tests made for the Contractor's convenience.
 - 3. Repeat tests required because of the Contractor's failure to meet Specification requirements.
- E. The testing laboratory is not authorized to approve or accept any portion of the Work; rescind, alter or augment the requirements of the Contract Documents; or perform any duties of the Contractor.

1.2 QUALIFICATIONS OF LABORATORY

- A. Where applicable, the testing laboratory will meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, published by American Council of Independent Laboratories and the basic requirements of ASTM E329 "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction".
- B. Testing equipment used by the laboratory will be calibrated at maximum 12-month intervals by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.3 LABORATORY DUTIES

- A. The testing laboratory will:
 - 1. Cooperate with Owner's Representative and Contractor and provide qualified personnel promptly on notice.

SECTION 01410 – TESTING LABORATORY SERVICES

2. Perform specified inspections, sampling and testing of materials and methods of construction; comply with applicable standards; ascertain compliance with requirements of Contract Documents.
3. Promptly notify Owner's Representative and Contractor of irregularities or deficiencies of Work which are observed during performance of services.
4. Promptly submit 5 copies of reports of inspections and tests to Owner's Representative, including:
 - a. Date issued.
 - b. Project title and number.
 - c. Testing laboratory name and address.
 - d. Date of inspection or sampling.
 - e. Record of temperature and weather.
 - f. Date of test.
 - g. Identification of product and Specification Section.
 - h. Location in Project.
 - i. Type of inspection or test.
 - j. Results of tests and observations regarding compliance with Contract Documents.
5. Perform additional tests and services as required by Owner.

1.4 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall:
 1. Cooperate with laboratory personnel; provide access to Work and to manufacturer's operations.
 2. Provide preliminary representative samples of materials to be tested to the laboratory in the required quantities.
 3. Furnish copies of product test reports.
 4. Provide the preliminary design mix proposed for concrete and other material mixes to the laboratory that require testing by the testing laboratory.
 5. Furnish labor and facilities:
 - a. To provide access to Work to be tested.

SECTION 01410 – TESTING LABORATORY SERVICES

- b. To obtain and handle samples at the site.
 - c. To facilitate inspections and tests.
 - d. For the laboratory's exclusive use for storage and curing of test samples.
 - e. Forms for preparing concrete test beams and cylinders.
6. Notify laboratory and Owner's Representative sufficiently three (3) business days in advance of operations to allow for assignment of personnel and scheduling of tests.
 7. Arrange with laboratory and pay for additional samples and tests required for Contractor's convenience.

END OF SECTION

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SECTION 01510 – TEMPORARY CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.1 GENERAL

- A. Contractor shall be responsible for all temporary construction facilities required for the Work. Contractor shall make all arrangements with utility service companies for temporary services and shall pay all costs associated therewith.
- B. Temporary construction facilities include:
 - 1. Water.
 - 2. Sanitary and First Aid Facilities.
- C. Contractor shall abide by all rules and regulations of the utility service company or authority having jurisdiction.
- D. Provide all materials, equipment and power required for temporary electricity and lighting. Include continuous power for construction site offices. Provide all outlets with circuit breaker protection and comply with ground fault protection requirements of NEC.
- E. Suitably enclosed chemical or self-contained toilets shall be provided for the use of the men employed on the Work. Toilets shall be located near the Work site and secluded from observation insofar as possible. Toilets shall be serviced at regular intervals, kept clean and supplied throughout the course of the Work.
- F. Contractor shall furnish and maintain a safe drinking water supply readily available to all workers.
- G. Contractor shall be responsible for all utility service costs until the Work is substantially complete. Included are all fuel, power, light, heat and other utility services necessary for execution, completion, testing and initial operation of the Work.
- H. Contractor shall:
 - 1. Comply with applicable requirements specified in Divisions 15.
 - 2. Maintain and operate systems to assure continuous service.
 - 3. Modify and extend systems as Work progress requires.
 - 4. Completely remove temporary materials and equipment when their use is no longer required.
 - 5. Clean and repair damage caused by temporary installations or use of temporary facilities.
 - 6. Restore existing facilities used for temporary services to the specified condition or to the original condition.

SECTION 01510 – TEMPORARY CONSTRUCTION FACILITIES

- I. The owner procured EFI PRS stations will be stored at the District Headquarters for the contractor obtain.

END OF SECTION

SECTION 01545 – PROTECTION OF THE WORK AND PROPERTY

PART 1 - GENERAL

1.1 GENERAL

- A. Contractor shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.
- B. In order to prevent damage, injury or loss, Contractor's actions shall include but not be limited to, the following:
 - 1. Store apparatus, materials, supplies, and equipment in an orderly safe manner that will not unduly interfere with the progress of the Work or the Work of any other contractor or utility service company.
 - 2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.
 - 3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
 - 4. Clean up daily all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance. Perform major cleaning every Friday, or Thursday if Friday is a holiday.
 - 5. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.
- C. Contractor shall not, except after written consent from proper parties, enter or occupy privately-owned land with men, tools, materials or equipment, except on easements provided herein.
- D. Contractor shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the Contractor, it shall be restored by the Contractor, at his expense, to a condition equal to that existing before the damage was done.

1.2 PROTECTION OF EXISTING STRUCTURES

- A. Underground Structures:
 - 1. Underground structures are defined to include, but not be limited to, all sewer, water, gas, storm drains, and other piping, and manholes, chambers, electrical conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.

SECTION 01545 – PROTECTION OF THE WORK AND PROPERTY

2. All underground structures known to Engineer except water, sewer, electric, and telephone service connections are shown. This information is shown for the assistance of Contractor in accordance with the best information available, but is not guaranteed to be correct or complete.
3. Contractor shall explore ahead of his trenching and excavation Work and shall uncover and pothole all obstructing underground structures a minimum of two (2) weeks prior to start of excavation per Section 01043 to determine their location, to prevent damage to them and to prevent interruption to the services which such structures provide. If Contractor damages an underground structure, he shall restore it to original condition at his expense.
4. Necessary changes in the location of the Work may be made by Engineer, to avoid unanticipated underground structures.
5. If permanent relocation of an underground structure or other subsurface facility is required and is not otherwise provided for in the Contract Documents, Engineer will direct Contractor in writing to perform the Work, which shall be paid for under the provisions of the General Conditions.
6. The Contractor shall call U.S.A. Dig Alert at 811 a minimum of two working days prior to any excavation.

B. Surface Structures:

1. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

C. Protection of Underground and Surface Structures:

1. Contractor shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the Work of sustaining and supporting such structure, Contractor shall satisfy the Engineer that the methods and procedures to be used have been approved by the party owning same.
2. Contractor shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits of the Work. Contractor shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure. Contractor shall repair immediately all damage caused by his Work, to the satisfaction of the Owner of the damaged structure.

SECTION 01545 – PROTECTION OF THE WORK AND PROPERTY

- D. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at Contractor's expense.

1.3 PROTECTION OF INSTALLED PRODUCTS

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.
- B. Control traffic to prevent damage to equipment, materials and surfaces.

1.4 PROTECTION OF SURVEY OR ROADWAY MARKERS

- A. The Contractor shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced for easy and accurate restoration. It shall be the Contractor's responsibility to notify the proper representatives of the Owner of the time and location that Work will be done. Such notification shall be sufficiently in advance of construction so that there will be no delay due to waiting for survey points to be satisfactorily referenced for restoration. All survey markers or points disturbed without proper authorization by the Engineer will be accurately restored by the Owner at the Contractor's expense after all street or roadway resurfacing has been completed.

1.5 RESURFACING

- A. The Contractor shall promptly place temporary surfacing on all areas where existing surfacing has been disturbed and shall maintain such surfacing for the period of time required by the Engineer. Temporary resurfacing shall be constructed in accordance with the following requirements.
 - 1. The subgrade shall be uniformly watered sufficiently to eliminate all dust, but not to such extent as to form mud or pools of water. The street and surrounding area shall be cleared of rubbish and debris. The street shall be swept and the surrounding area shall be cleaned thoroughly.
 - 2. The temporary resurfacing shall then be spread over the prepared foundation material and rolled with an 8-ton tandem roller in such a manner that after rolling, the temporary resurfacing shall present a smooth surface for traffic, shall not be less than 1-1/2-inches in compacted thickness and shall be maintained free from bumps and depressions until permanent resurfacing is placed. The finished surface of said temporary resurfacing shall be flush with the adjoining pavement grade.
 - 3. The Contractor shall have immediate access enough temporary resurfacing material on the job to ensure a ready supply at all times for necessary repairs to the temporary resurfacing already placed.

SECTION 01545 – PROTECTION OF THE WORK AND PROPERTY

4. The temporary resurfacing shall be left in place until permanent resurfacing is constructed.
5. No separate payment will be allowed for temporary resurfacing and all costs therefore shall be included with the associated items of contract work.

1.6 PROTECTION OF TREES AND LANDSCAPING

- A The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs or other existing landscaping, including those lying within or beyond street rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been approved for trimming or removal as described on the Plans, or by the Owner's Representative and the jurisdictional agency. All existing trees and landscaping which are damaged during the construction shall be trimmed or replaced by the Contractor or a certified landscape maintenance company under permit from the jurisdictional Owner and to the satisfaction of said agency and/or the Owner. All costs shall be borne by the Contractor.

END OF SECTION

SECTION 01550 – WORK RESTRICTIONS

PART 1 - GENERAL

1.1 HIGHWAY LIMITATIONS

- A. The Contractor shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the Work. It shall be the Contractor's responsibility to construct and maintain, at its own expense, any haul roads required for its construction operations.

1.2 TEMPORARY CROSSING

- A. Not Used.
- B. Street Use: Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, alleys, ways, parking area or private road during the performance of the Work hereunder, and it shall so conduct its operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such street, alley ways, or parking areas. No street shall be closed to the public without first obtaining permission of the Engineer and the jurisdictional authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise provided or shown. Tow boards shall be provided to retain excavated material if required by the Engineer or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the Work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to assure the use of sidewalks and the proper functioning of all gutters, sewer inlets, and other drainage facilities. Pedestrians shall be safely routed around active construction zones.
- C. Traffic Control: For the protection of traffic in public or private streets and ways, the Contractor shall provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights, and other safety devices in accordance with the requirements of the "Manual of Uniform Traffic Control Devices, Part IV - Traffic Controls for Street and Highway Construction and Maintenance Operation", published by U.S. Department of Transportation, Federal Highway Administration (ANSI D6.1-1978). The Contractor shall take all necessary precautions for the protection of the Work and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. The Contractor shall station such guards or flaggers and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. All signs, signals, and barricades shall conform to the requirements of Cal-OSHA and Subpart G, Part 1926, of the OSHA Safety and Health Standards for Construction. Contractor shall prepare, apply for, pay associated fees, and obtain all necessary permits and approvals from the city of Encinitas for traffic control. The Contractor shall be responsible for the preparation and implementation of all traffic control plans and requirements as defined by the City of Encinitas, including all requirements for areas where night work is required.
- D. Traffic Message Boards : Message boards, see Section 00810, shall be placed not less than 1 week prior to the commencement of work in the referenced streets and the message shall be approved by the District. Locations for all message boards shall

SECTION 01550 – WORK RESTRICTIONS

be approved by the City of Encinitas as part of the traffic control permit acquired by the Contractor. See Section 00810.

- E. Street Closure: If closure of any street is required during construction, a formal application for a street closure shall be made to the authority having jurisdiction at least 30 days prior to the required street closure in order to determine necessary signing and detour requirements. See Section 00810.
- F. School: The Contractor shall be made aware of Encinitas Union School District's Flora Vista Elementary School hours. Flora Vista Elementary School hours are 8:00 AM to 2:20 PM Monday through Thursday and 8:00 AM to 12:45 PM on Friday.
- G. Shutdowns: See Section 01403 – Coordination with Owner's Operations.
- H. Working hours are from 7:30 am to 5:00 Monday through Friday.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

SECTION 01560 – TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor shall provide and maintain methods, equipment, and temporary construction, as necessary to provide controls over environmental conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of Work.

1.2 NOISE CONTROL

- A. Vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case will noise levels be permitted which interfere with the work of the Owner or others.

1.3 DUST CONTROL

- A. Control objectionable dust caused by the operation of vehicles and equipment, clearing or any reason whatsoever. Apply water and calcium chloride or use other dust control methods subject to the Engineer's approval.

1.4 PEST AND RODENT CONTROL

- A. Provide rodent and pest control as necessary to prevent infestation of construction or storage area. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.

1.5 WATER CONTROL

- A. Provide methods to control surface water and water from excavations and structures to prevent damage to the Work, the site, or adjoining properties.
 - 1. Control fill, grading and ditching to direct water away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff courses so as to prevent any erosion, damage or nuisance.
- B. Provide, operate and maintain equipment and facilities of adequate size to control surface water.
- C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with all environmental requirements.

SECTION 01560 – TEMPORARY CONTROLS

1.6 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
- B. Provide equipment and personnel, and perform emergency measures required to contain any spillages, and to remove soils or liquids contaminated as a result of Contactor's activities.
 - 1. Excavate and dispose offsite any contaminated soil or liquid and replace with suitable compacted fill and topsoil.
- C. Take special measures to prevent harmful substances from entering public waters.
 - 1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
- D. Provide systems for control of atmospheric pollutants.
 - 1. Prevent toxic concentrations of chemicals.
 - 2. Prevent harmful dispersal of pollutants into the atmosphere.
- E. Equipment used during construction shall conform to all current federal, state and local laws and regulations.

1.7 EROSION CONTROL

- A. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills and from borrow and waste disposal areas, and to prevent erosion and sedimentation.
 - 1. Hold the areas of bare soil exposed at one time to a minimum.
 - 2. Provide temporary control measures such as berms, dikes and drains.
- B. Construct fills and waste areas by selective placement to eliminate surface silts or clays which will erode.
- C. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

END OF SECTION

SECTION 01620 – STORAGE OF MATERIAL

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor shall store and protect materials in accordance with manufacturer's recommendations and the requirements of specifications.
- B. Make all arrangements and provisions necessary for the storage of materials and equipment. All excavated materials, construction equipment, and materials and equipment to be incorporated into the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Materials and equipment shall be kept neatly and compactly stored in locations that will cause a minimum of inconvenience to other contractors, public travel, adjoining owners, tenants and occupants. Arrange storage in a manner to provide easy access for inspection.
- C. Areas available on the construction site for storage of material and equipment shall be as shown or approved by the Owner's Representative.
- D. Materials and equipment which are to become the property of the Owner shall be stored to facilitate their inspection and ensure preservation of the quality and fitness of the Work, including proper protection against damage by freezing and moisture. They shall be placed in enclosed storage areas unless otherwise acceptable to Owner.
- E. The Contractor is responsible for identifying and obtaining necessary permits and permissions for any and all staging and storage areas needed for this project. For any area to be used by the Contractor, the Contractor shall coordinate with the property owner, obtain written permission from the property owner for use of the area, coordinate with any resource or permitting agency that may have jurisdiction over the area, obtain and pay for any permits or agreements and provide any environmental mitigation required, and pay any fees or rental charges required for use of the area. The Contractor shall provide to the District Representative a copy of the letter from the property owner giving permission to use their property as a staging/laydown area. The Contractor shall be responsible for returning all areas used to their original conditions. At least 14 days prior to moving onto any site, the Contractor shall submit to the District Representative a copy of the written permission letter from the property owner of that area, and a description of any permits and mitigation actions that are required for use of the area. Submittals shall be in accordance with Section 01720. All requests for the use of privately-owned land must be submitted to the District for written approval prior to its use. The District may deny use of any privately owned property for this project in its sole discretion.
- F. Contractor shall be fully responsible for loss or damage to stored materials and equipment.
- G. Do not open manufacturer's containers until time of installation unless recommended by the manufacturer or otherwise specified.

SECTION 01620 – STORAGE OF MATERIAL

- H. Do not store products in the structures being constructed unless approved in writing by the Owner's Representative.

1.2 UNCOVERED STORAGE

- A. The following types of materials may be stored out-of-doors without cover:
 - 1. Reinforcing steel.
- B. Store the above materials on wood blocking so there is no contact with the ground.

1.3 COVERED STORAGE

- A. The following types of materials may be stored outdoors if covered with material impervious to water:
 - 1. Valves.
- B. Contractor shall tie down covers with rope and slope covers to prevent accumulation of water on covers.
- C. Contractor shall store materials on wood blocking.

1.4 FULLY PROTECTED STORAGE

- A. Protect mechanical and electrical equipment from being contaminated by dust, dirt and moisture.
- B. Maintain humidity at levels recommended by manufacturers for electrical and electronic equipment.

1.5 MAINTENANCE OF STORAGE

- A. Maintain a periodic system of inspection of stored products on a regularly scheduled basis to assure that:
 - 1. State of storage facilities is adequate to provide required conditions.
 - 2. Required environmental conditions are maintained on continuing basis.
 - 3. Products exposed to elements are not adversely affected.

END OF SECTION

SECTION 01630 – SUBSTITUTIONS

PART 1 - GENERAL

1.1 GENERAL

- A. Requests for review of a substitution shall contain complete data substantiating compliance of the proposed substitution with the Contract Documents.

1.2 CONTRACTOR'S OPTIONS

- A. For materials or equipment (hereinafter products) specified only by reference standard, select product meeting that standard, by any manufacturer, fabricator, supplier or distributor (hereinafter manufacturer). To the maximum extent possible, provide products of the same generic kind from a single source.
- B. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named which complies with Specifications.
- C. For products specified by naming one or more products or manufacturers and stating "equivalent", submit a request for a substitution for any product or manufacturer which is not specifically named.
- D. For products specified by naming only one product or manufacturer and followed by words indicating that no substitution is permitted, there is no option and no substitution will be allowed.
- E. Where more than one choice is available as a Contractor's option, select product which is compatible with other products already selected or specified.

1.3 SUBSTITUTIONS

- A. During a period of 60 days after date of commencement of Contract Time, Engineer will consider written requests from Contractor for substitution of products or manufacturers, and construction methods (if specified).
 - 1. After end of specified period, requests will be considered only in case of unavailability of product or other conditions beyond control of Contractor.
- B. Contractor shall submit one (1) electronic copy (PDF format) request for substitution. Submit separate request for each substitution. Include in each request the following:
 - 1. For products or manufacturers:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature with product description, performance and test data, and reference standards.
 - c. Samples, if appropriate.

SECTION 01630 – SUBSTITUTIONS

- d. Name and address of similar projects on which product was used, and date of installation.
 2. For construction methods (if specified):
 - a. Detailed description of proposed method.
 - b. Drawings illustrating method.
 3. Such other data as the Engineer may require to establish that the proposed substitution is equivalent to the product, manufacturer or method specified.
- C. In making request for substitution, Contractor represents that:
1. Contractor has investigated proposed substitution, and determined that it is equivalent to or superior in all respects to the product, manufacturer or method specified.
 2. Contractor will provide the same or better guarantees or warranties for proposed substitution as for product, manufacturer or method specified.
 3. Contractor waives all claims for additional costs or extension of time related to proposed substitution that subsequently may become apparent.
- D. A proposed substitution will not be accepted if:
1. Acceptance will require changes in the design concept or a substantial revision of the Contract Documents.
 2. It will delay completion of the Work, or the work of other contractors.
 3. It is indicated or implied on a Shop Drawing and is not accompanied by a formal request for substitution from Contractor.
- E. If the Engineer determines that a proposed substitute is not equivalent to that specified, Contractor shall furnish the product, manufacturer or method specified at no additional cost to Owner.
- F. Approval of a substitution will not relieve Contractor from the requirement for submission of Shop Drawings as set forth in the Contract Documents.

END OF SECTION

SECTION 01700 – PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor shall thoroughly clean the project site, as described in Section 01710, prior to final acceptance of the Work by the Owner.
- B. The Contractor shall conduct Performance Tests for each element of the Work as described in the individual Sections. Where no performance test is specified, the Contractor shall demonstrate satisfactory performance for a period of one week prior to final acceptance.
- C. The Contractor shall establish dates for equipment testing and acceptance periods. The times shall be within the Contract time.

1.2 FINAL SUBMITTALS

- A. The Contractor, prior to requesting final payment, shall obtain and submit the following items to the Engineer for transmittal to the Owner:
 - 1. Written guarantee, where required.
 - 2. Operating manuals and instructions.
 - 3. Maintenance stock items; spare parts, special tools.
 - 4. Completed record drawings shall be submitted on the original signed mylars. All construction changes shall be hand drafted onto the original signed mylar and approved by the Owner prior to project completion. Approved Record Drawings shall be scanned and submitted to the Owner.
 - 5. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.

END OF SECTION

(BLANK)

SECTION 01710 – CLEANING

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor shall execute cleaning during progress of the Work, at completion of the Work, and as required by General Conditions.
- B. Requirements of Regulatory Agencies:
 - 1. In addition to the requirements herein, maintain the cleanliness of the Work and surrounding premises within the Work limits so as to comply with federal, state, and local fire and safety laws, ordinances, codes and regulations.
 - 2. Comply with all federal, state and local anti-pollution laws, ordinances, codes and regulations when disposing of waste materials, debris and rubbish.
- C. Scheduling of Cleaning and Disposal Operations:
 - 1. Schedule all cleaning and disposal operations so that dust, wash water or other contaminants generated during such operations do not damage or mar painted or finished surfaces.
 - 2. Prevent accumulation of dust, dirt, debris, rubbish and waste materials on or within the Work or on the premises surrounding the Work.
- D. Waste Disposal:
 - 1. Dispose of all waste materials, surplus materials, debris and rubbish off the site.
 - 2. Do not burn or bury rubbish and waste materials on the site.
 - 3. Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 - 4. Do not discharge wastes into streams or waterways.
- E. Cleaning Materials:
 - 1. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
 - 2. Use each type of cleaning material on only those surfaces recommended by the cleaning material manufacturer.
 - 3. Use only materials, which will not create hazards to health or property.

SECTION 01710 – CLEANING

F. During Construction:

1. Keep the Work and surrounding premises within work limits free of accumulations of dirt, dust, waste materials, debris and rubbish.
2. Keep dust generating areas wetted down.
3. Provide suitable containers for storage of waste materials, debris and rubbish until time of disposal.
4. Dispose of waste, debris and rubbish off site at legal disposal areas.

G. At Project Completion:

1. Remove and dispose of all excess or waste materials, debris, rubbish, and temporary facilities from the site, structures and all facilities.
2. Repair pavement, roads, sod, and all other areas affected by construction operations and restore them to original condition or to minimum condition specified.
3. Remove spatter, grease, stains, fingerprints, dirt, dust, labels, tags, packing materials and other foreign items or substances from interior and exterior surfaces, equipment, signs and lettering.
4. Repair, patch and touch up chipped, scratched, dented or otherwise marred surfaces to match specified finish.
5. Remove paint, clean and restore all equipment and material nameplates, labels and other identification markings.
6. Wash and shine mirrors, glazing and polished surfaces.
7. Clean all floors, slabs, pavements, and ground surfaces.
8. Maintain cleaning until acceptance of the Project by the Owner.

END OF SECTION

SECTION 01720 – RECORD DOCUMENTS

PART 1 - GENERAL

1.1 GENERAL

- A. Contractor shall maintain and provide the Engineer with Record Documents as specified below, except where otherwise specified or as modified in this specification.
- B. Maintenance of Documents:
 - 1. The Contractor shall maintain, in Contractor's field office in clean, dry, legible condition, complete sets of the following: Drawings, Specifications, Addenda, approved Shop Drawings, Samples, photographs, Change Orders, other modifications of Contract Documents, test records, survey data, Field Orders, and all other documents pertinent to Contractor's Work.
 - 2. The Contractor shall provide files and racks for proper storage and easy access. The filing format shall be in accordance with the format of the Construction Specification Institute (CSI), unless otherwise approved by Owner's Representative.
 - 3. The Contractor shall make documents available at all times for inspection by the Engineer, Owner's Representative and Owner. The District's representative shall review monthly updated as-builts as a condition of monthly payment.
 - 4. The Contractor shall not use Record Documents for any other purpose and shall not remove them from the Contractor's office without Owner's Representative approval.
- C. Marking System: The Contractor shall provide colored pencils or felt tipped pens for marking changes, revisions, additions and deletions, to the record set of Drawings. Use following color code unless otherwise approved by the Owner's Representative:
 - 1. Process and Mechanical: Red
 - 2. Architectural: Blue
 - 3. Structural: Purple
 - 4. Plumbing: Brown
 - 5. Other Printed Notations: Black
- D. Recording:
 - 1. The Contractor shall label each document "PROJECT RECORD" in 2-inch high printed letters.

SECTION 01720 – RECORD DOCUMENTS

2. The Contractor shall keep record documents current.
 3. The Contractor shall not permanently conceal any Work until required information has been recorded.
 4. Drawings: The Contractor shall legibly mark to record actual construction the following items:
 - a. Depths of various elements of foundation in relation to datum.
 - b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - d. Field changes of dimensions and details.
 - e. Changes made by Change Order or Field Order.
 - f. Details not on original Drawings.
 5. Specifications and Addenda: The Contractor shall legibly mark up each Section to record:
 - a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
 - b. Changes made by Change Order or Field Order.
 - c. Other matters not originally specified.
- E. Submittal:
1. Upon Substantial Completion of the Work, the Contractor shall deliver record documents to Owner's Representative. Final payment will not be made until satisfactory record documents are received by Owner's Representative.
 2. The Contractor shall accompany the submittal with transmittal letter containing:
 - a. Date.
 - b. Project title and number.
 - c. Contractor's name and address.
 - d. Title and number of each record document.

SECTION 01720 – RECORD DOCUMENTS

- e. Certification that each document as submitted is complete and accurate.
- f. Signature of Contractor, or his authorized representative.

END OF SECTION

(BLANK)

SECTION 02050 DEMOLITION AND REMOVAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies demolition and removal of structures, portion of structures, utilities, and other items shown on the contract drawings.
- B. Do not begin demolition until authorization has been received from the City's Representative. Remove rubbish and debris so as not to allow accumulation at the site.

1.2 RELATED WORK

- A. Standard Drawings
- B. Record Drawings and Submittals: STD SPEC 01300
- C. Excavation and Earthwork: Section 02200

1.3 QUALITY ASSURANCE

- A. General: All work shall be performed in accordance with the local building codes, State Industrial Safety Orders and requirements of the Occupational Safety and Health Act requirements.
- B. Protection: Demolition shall be performed in such a manner as to not harm adjacent structures, utilities, systems, equipment, existing landscaping or natural vegetation. The Contractor shall assume full responsibility for such disturbance. All costs for such repair, rehabilitation, or modifications shall be incurred by the Contractor at no additional cost to the District.
- C. Contractor shall provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for the protection of all personnel during the demolition and removal activities.
- D. Contractor shall maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.
- E. Prevent spread of flying particles and dust. Contractor shall sprinkle rubbish and debris with water to keep dust to a minimum.

1.4 UTILITY SERVICES

- A. Demolish and remove outside utility service lines shown.
- B. Remove abandoned outside utility lines that would interfere with installation of new utility lines and new construction.

1.5 WORKPAYMENT

- A. Payment for the Work in this Section shall be included as part of the lump-sum or unit-price bid amount for which such Work is appurtenant thereto, including all Work and materials specified herein and as may be required to complete this portion of the Work.
- B. Include all costs for Work including all labor, supervision, materials, professional services, transportation, etc.

PART 2 - MATERIALS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Contractor shall notify the District's Representative when demolition and removal activities are complete.

3.2 PERFORMANCE

- A. Demolition: Completely demolish and remove equipment, buildings and structures as indicated on the plans.

Debris, including brick, concrete, stone, metals and similar materials shall become property of Contractor and shall be disposed by him/her, off the property.

Where adjoining structures are to be kept in place, the demolition limit lines shall be neatly saw-cut. Sections to be removed shall be broken out, and the remaining face shall be chipped back to the saw-cut line. The Contractor shall do the necessary work to provide the remaining face with a finish compatible with the surrounding surfaces.

- B. Equipment and Piping Removal: All equipment and piping to be removed shall be properly disconnected from structures, piping, electrical and instrumentation systems. The Contractor shall do all resurfacing and other work as necessary to comply with the above requirements.
- C. Pavement Removal: All pavements shall be saw-cut on a neat line at right angles to the curb face.
- D. Utility Interference: Where existing utilities interfere with the prosecution of the work, Contractor shall relocate them.
- E. Electrical Equipment Removal: All electrical equipment, conduit, wiring, etc. to be removed shall be properly de-energized, made safe, and disconnected from all sources of power prior to demolition. All remaining electrical equipment, located within the demolition area, shall be labeled and indicated as energized.

3.3 SALVAGE

- A. District has the right to salvage any items scheduled for removal. The Contractor shall notify the District's Representative five (5) days prior to any salvage or demolition work to determine the disposition of items to be removed. The District's Representative will mark items to be salvaged. Such items shall be properly disconnected, removed from their foundations, cleaned, and stored at a location on the plant site as specified or as directed by the District's Representative.

Contractor shall utilize care so not to damage equipment to be salvaged and reused onsite. Any damage caused by Contractor while salvaging equipment shall be repaired at Contractors expense.

3.4 BACKFILL

- A. Holes, trenches or depressions in the ground remaining after demolition of structures, pipelines, or equipment shall be filled with compacted backfill materials as specified in Section 02200.

3.5 CLEAN-UP

- A. The Contractor shall leave site in clean condition satisfactory to the District's Representative. Clean- up shall include but not be limited to disposal of all items, materials, debris, and rubbish. Contractor shall remove items, material, debris, and rubbish to a legal off-site landfill.

END OF SECTION

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SECTION 02140 – DEWATERING

SECTION 02140 - DEWATERING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section includes materials, installation, maintenance, operation and removal of temporary dewatering systems.
- B. The contractor shall perform site dewatering as necessary to lower and control groundwater levels and hydrostatic pressures to allow excavation and construction to be performed under drained and stable conditions.
- C. Dewatering operations shall be adequate to ensure the integrity of the finished project. The responsibility for conducting the dewatering operation in a manner which will protect the Work and adjacent structures and facilities rest solely with the Contractor. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the sole responsibility of the Contractor.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Earthwork: STD SPEC 02200
- D. Trenching, Backfilling, and Compacting: STD SPEC 02223.
- E. Geotechnical Report, see Appendix A.

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. The Contractor shall obtain all required permits and approvals and comply with California Regional Water Quality Control Board General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters within the San Diego Region.

1.04 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Before starting excavation, submit copies of well installation permits if required.
- C. Before excavation, submit copies of its permit for dewatering discharges to the local sewer agency or Regional Water Quality Control Board permit for dewatering to the environment, whichever is applicable.
- D. The contractor shall submit copies of well destruction permits, as applicable.
- E. The Contractor shall submit a daily report that includes the following information:

SECTION 02140 – DEWATERING

1. Groundwater levels and piezometric water levels in observation wells (if any).
2. Changes in elevation of settlement monitoring points to detect settlement in adjacent structures.
3. The dewatering flow rate recorded at least hourly and the total volume discharged for the day.
4. Water quality test results as required by the Regional Water Quality Control Board or local sewer agency, as applicable.

1.05 QUALITY ASSURANCE.

- A. The proposed dewatering system shop drawings shall demonstrate, to the satisfaction of the Owner's Representative, that adequate personnel, materials and equipment are available for successful dewatering operations.
- B. Maintain adequate control to ensure that the stability of excavated or constructed slopes are not adversely affected by water, that erosion is controlled, and that flooding of excavations or damage to structures does not occur.
- C. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, establish points for settlement monitoring and shall observe these points at frequent intervals to detect any settlement which may occur. The monitoring frequency shall be determined based on recommendations of the soils engineer or Owner, the nature of the critical structure or facility, and the distance from the excavation. The minimum frequency shall be three times per eight-hour work shift (beginning, middle and end of the work period).

PART 2 - MATERIALS

- A. Dewatering, where indicated, includes well points, sump pumps, temporary pipelines for water disposal, storage tanks, water treatment system as needed to meet permit requirements, rock or gravel placement, observation wells and other means including standby pumping equipment maintained on the job site continuously.
- B. Provide piezometers for monitoring groundwater levels. Provide other instruments and measuring devices as required.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Comply with Regional Water Quality Control Board or local sewer agency requirements for any discharge of groundwater to the environment or sanitary sewer, whichever is applicable. Before starting dewatering operations, obtain authorization, as required, for the disposal of groundwater. Comply with all applicable sampling, testing, monitoring, and reporting requirements.

SECTION 02140 – DEWATERING

- B. Grade the site or otherwise divert runoff away from the excavation. Surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, or drained by gravity away from the excavation.
- C. Install and maintain an adequate system to lower and control the groundwater to permit excavation, construction of structures, and placement of fill or backfill materials to be performed under drained and stable conditions.
- D. Sufficient dewatering equipment shall be installed to pre-drain the water-bearing strata below the bottom of foundations, drains, sewers and other subsurface structures or the excavation subgrade.
- E. The hydrostatic head in water-bearing strata below foundations, drains, sewers, pipelines and other subsurface structures or excavations shall be reduced to below the structure or excavation subgrade at all times.
- F. Place the system into operation prior to excavating below the groundwater level. The system shall be operated continuously or intermittently as may be required to sufficiently lower the groundwater levels to allow the construction of the Work. Continue the dewatering operations until construction of the improvements is completed and fill or backfill materials are placed and compacted.
- G. Dewater in order to provide a stable subgrade at proposed bottom of excavation. Provide and maintain means and devices to remove and dispose of all water entering the excavation during the period when concrete is being placed and during the hydration process, when pipe is being laid, and during backfill placement.
- H. Prevent the flotation of structures by maintaining a positive and continuous removal of water from locations which will not create an adverse hydraulic gradient beneath or adjacent to the structures.
- I. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock at no additional cost to the Owner.
- J. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sandpacked and/or other means shall be used to prevent pumping of fine sands or silts from the subsurface. Continuously monitor the dewatering operation for indications of subsurface soil migration and make necessary adjustments as warranted with notice to the Engineer.
- K. Water and debris shall be disposed of in a legal manner in compliance with permit requirements and SSPWC Subsection 3-12 without damage to adjacent property. No water shall be drained onto the Work under construction. Before disposal, water shall be filtered to remove sand and fine soil particles and treated in accordance with permit requirements.

END OF SECTION

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SECTION 02200 – EARTHWORK

STANDARD SPECIFICATION SECTION 02200 EARTHWORK

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, installation and testing of earthwork for excavations, fills and embankments for structures and sites.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Dewatering: STD SPEC 02140
- D. General Concrete Construction: STD SPEC 03000.

1.03 EARTHWORK AND REPAIRS IN CITY, COUNTY, AND STATE RIGHTS OF WAY

Conform to the requirements and provisions of the permits issued by those agencies in addition to the requirements of these Standard Specifications. If a permit is not required, earthwork and repairs shall conform to the standards of the agency in whose right of way the work is done in addition to the requirements of these Standard Specifications.

1.04 SAFETY PRECAUTIONS

Observe safety precautions in all phases of the work. Included shall be trench shoring, bracing, lighting, and barricades as dictated by reason and by the Safety Orders of the Division of Industrial Safety, State of California (CAL/OSHA). Acquire an exemption letter or trenching permit from the California Division of Industrial Safety (CAL/OSHA) and comply with Labor Code Section 6705, Excavation Plans for Worker Protection. Submit a copy of the exemption letter or trenching permit with excavation drawings to the District prior to excavation work.

1.05 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Submit a report from a testing laboratory verifying that imported material is asbestos-free and conforms to the specified gradations or characteristics.

1.06 TESTING FOR COMPACTION

- A. The District will employ and pay for an independent testing laboratory to perform testing for compaction as described below.
- B. Determine the density of soil in place by the sand cone method, ASTM D 1556, or by nuclear methods, ASTM D 2922 and D 3017.

SECTION 02200 – EARTHWORK

- C. Determine laboratory moisture-density relations of soils by ASTM D 1557.
- D. Determine the relative density of cohesionless soils by ASTM D 4253 and D 4254.
- E. Sample backfill materials by ASTM D 75.
- F. "Relative compaction" is the ratio, expressed as a percentage, of the in-place dry density to the laboratory maximum dry density.
- G. Make excavation for compaction tests at the locations and to the depths designated by the District's Representative. Backfill and recompact the excavations at completion of testing. When tests indicate that the compaction is less than the specified relative compaction, rework and retest those areas until the specified relative compaction has been obtained.

1.07 WATER FOR CONSTRUCTION

Water supplied by the District, for whatever needs and uses, shall be paid for in accordance with the rates and rules of the District. The only exception is by written agreement with the District.

PART 2 - MATERIALS

2.01 NATIVE EARTH BACKFILL

Native earth backfill shall be excavated fine grained materials or loose soil free of asbestos, from organic matter, roots, debris, rocks larger than 6 inches in diameter, clods, clay balls, broken pavement, and other deleterious materials.

2.02 IMPORTED FILL MATERIAL

Imported fill material for embankment construction shall be free of asbestos, organic matter, and other deleterious substances and shall not contain rocks or lumps larger than 6 inches in the greatest dimension. The District's Representative and his authorized agent will evaluate the proposed imported fill material prior to placement.

2.03 GRANULAR MATERIAL FOR STRUCTURAL BACKFILL

- A. Granular material for structural backfill shall be free of asbestos, organic materials, clay balls, and shall have the following gradation:

SECTION 02200 – EARTHWORK

<u>Sieve Size</u>	<u>Percent Passing By Weight</u>
3/4-inch	100
1/2- inch	95 - 100
3/8-inch	50 - 100
No. 4	20 - 65
No. 8	10 - 40
No. 40	0 - 20
No. 200	0 - 5

- B. Whenever the phrase "structural backfill material" is used in these Standard Specifications, it shall mean granular material for structural backfill as described above.
- C. Excavated material may be used for structural backfill provided it conforms to the Standard Specifications for structural backfill material.

2.04 WATER FOR COMPACTION

Water used in compaction shall have a maximum chloride concentration of 500 mg/l, a maximum sulfate concentration of 500 mg/l, and shall have a pH of 7.0 to 9.0. Water shall be free of acid, alkali, or organic materials. Salt water will not be allowed.

PART 3 - EXECUTION

3.01 COMPACTION REQUIREMENTS

Unless otherwise shown on the Drawings, otherwise described in the Specifications or required by an agency having jurisdiction over the area of the work, compaction of fill areas and embankments shall be a minimum of 90% relative compaction. The top 12 inches of subgrade beneath pavements should be compacted to at least 95% relative compaction. The maximum density and optimum moisture content for the evaluation of relative compaction should be determined in accordance with ASTM D1557.

3.02 DEWATERING PER STANDARD SPECIFICATION 02140 EXCAVATION

- A. Perform all excavation regardless of the type, nature, or condition of the material encountered to accomplish the construction. Do not operate excavation equipment within 5 feet of existing structures or newly completed construction. Excavate with hand tools in these areas.
- B. After the required excavation has been completed, the District's Representative will inspect the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation be conducted in all areas within the influence of the structure where unacceptable materials such as soft, spongy or deleterious materials exist at the exposed subgrade. Over-excavation shall include the removal of all such unacceptable material that exists directly beneath the structure or within a zone outside and below the structure defined by a line sloping at 1 horizontal to 1 vertical from the outside edge of the footing. Refill the over-excavated areas with structural backfill material.

SECTION 02200 – EARTHWORK

3.03 LIMITS OF EXCAVATION FOR FOUNDATIONS, VAULTS, AND STRUCTURES

Excavate to the depths and widths needed to accomplish the construction. Allow for forms, working space, structural backfill and site grading. Do not carry excavation for footings, slabs or conduits deeper than the elevations shown, unless unacceptable material is encountered. Backfill over-excavations, below the elevations shown to the proper elevation, with structural backfill material compacted as specified for structural backfills around structures. Correct cuts below grade by similarly cutting adjoining areas and creating a smooth transition.

3.04 PREPARED SUBGRADE FOR FOUNDATIONS, VAULTS, AND STRUCTURES

Excavate and shape subgrade to line, grade, and cross section. Compact exposed subgrade until the top 12 inches are compacted to 95% relative compaction. Remove soft or fractured material encountered and replace with structural backfill material. Fill holes, open joints, rock fractures, and depressions created by the excavation to the required line, grade, and cross sections with structural backfill material. Place a 6-inch minimum thickness of structural backfill material over the full width of the foundations, vaults, and structures and compact to 95% relative compaction. Extend the structural backfill material and compaction 12 inches beyond the edge of the foundations, vaults, and structures. The finished subgrade shall be within a tolerance of +/-0.08 of a foot of the grade and cross section shown, shall be smooth and free from irregularities, and shall be at the specified relative compaction.

3.05 PLACING STRUCTURAL BACKFILL MATERIAL

- A. Remove form materials and trash from the excavation before placing any fill material. Obtain the specified compressive strength and finish of concrete work per Standard Specifications Section 03000 before backfilling.
- B. Do not operate earthmoving equipment within 5 feet of walls of concrete structures. Place and compact backfill adjacent to concrete walls with hand-operated tampers or other equipment that will not damage the structure.
- C. Place structural backfill material around piping, structures, and other areas, including authorized over-excavation areas, to the lines and grades shown or specified. Do not exceed loose lifts of 8 inches. Compact each lift to a minimum of 90% relative compaction, unless otherwise shown. Stop backfill at least 6 inches below finished grade in all areas where topsoil is to be replaced.
- D. Place native earth backfill to the lines and grades shown in the areas that are not required to receive structural backfill material. Place native earth backfill in maximum 8-inch loose lifts and compact each lift to a minimum of 90% relative compaction, unless otherwise shown.

3.06 MOISTURE CONTROL OF EARTH FOR BACKFILLS AND EMBANKMENTS

During the compacting operations, maintain optimum practicable moisture content required for compaction purposes in each lift of the backfill material. Maintain moisture content uniform throughout the lift. Insofar as practicable, add water to the material at the site of excavation. Supplement by sprinkling the backfill material. At the time of compaction, the water content of the material shall be at optimum water content or within 2 percentage points above optimum. Aerate material containing excessive moisture by blading, discing, or harrowing to hasten the drying process.

SECTION 02200 – EARTHWORK

3.07 FINISH GRADING

Perform earthwork to the lines and grades shown on the Drawings. Remove exposed roots and loose rocks exceeding 3 inches in diameter. Round tops of banks to circular curves to not less than a 6-foot radius. Neatly and smoothly trim rounded surfaces.

3.08 DISPOSAL OF EXCESS EXCAVATED MATERIAL

Dispose of excess excavated material offsite. Contractor shall make his own arrangements for the legal disposal of the excess material and bear all costs incidental to such disposal. All State and Local Code requirements shall control the disposal of excess excavated material. No private property can be used without prior written approval by the OMWD General Manager

3.09 FINAL CLEAN-UP

After finish grading, make surfaces free of all cleared vegetation, rubbish and other construction wastes. Dispose of all exposed roots and excavated or surface rocks at a legal commercial refuse center. All State and Local Code requirements shall control the disposal of trees and shrubs. No private property can be used without prior written approval by the OMWD General Manager. Do not dispose of rocks within the work site by burying.

END OF SECTION

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SECTION 02223 – TRENCHING, BACKFILLING, AND COMPACTING

STANDARD SPECIFICATION SECTION 02223 TRENCHING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, installation, and testing of trench excavation, backfilling, and compacting.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Clearing, Grubbing, and Stripping: STD SPEC 02110.
- D. Dewatering: STD SPEC 02140
- E. Earthwork: STD SPEC 02200.
- F. Protecting Existing Underground Utilities: STD SPEC 02222.
- G. General Concrete Construction: STD SPEC 03000.
- H. Trench Cut Off Walls: STD SPEC 03480
- I. Trench Widths: STD SPEC

1.03 EARTHWORK AND REPAIRS IN CITY, COUNTY, AND STATE RIGHTS OF WAY

Conform to the requirements and provisions of the permits issued by those agencies in addition to the requirements of these Standard Specifications. If a permit is not required, earthwork and repairs shall conform to the standards of the agency in whose right of way the work is done in addition to the requirements of these Standard Specifications.

1.04 SAFETY PRECAUTIONS

Observe safety precautions in all phases of the work. Included shall be trench shoring, bracing, lighting, and barricades as dictated by reason and by the Safety Orders of the Division of Industrial Safety, State of California (CAL/OSHA). Acquire an exemption letter or trenching permit from the California Division of Industrial Safety (CAL/OSHA) and comply with Labor Code Section 6705, Excavation Plans For Worker Protection. Submit a copy of the exemption letter or trenching permit with excavation drawings to the District prior to excavation work.

1.05 REGIONAL NOTIFICATION CENTER CONTACT

- A. The Contractor shall contact the appropriate regional notification center prior to commencing any excavation work. Notify the center at least two working days in advance or up to a

SECTION 02223 – TRENCHING, BACKFILLING, AND COMPACTING

maximum of 14 calendar days in advance of any excavation work. The Contractor shall delineate the proposed excavation site with white paint on paved surfaces or with marking such as flags or stakes in unpaved areas. The Contractor shall provide the regional notification center with all job site location information. The regional notification center will assign to the Contractor a Dig Alert Number which validates the Contractor's excavation permit and will notify all of its members having subsurface installations in the area. No excavation shall be commenced and carried out by the Contractor until all existing subsurface installations have been field marked and the District has been given the Dig Alert Number by the Contractor.

- B. Subsurface installation means any underground pipeline, conduit, duct, wire, or other structure operated or maintained in or across a public street or public right-of-way (Government Code Section 4216).

1.06 OBSTRUCTIONS

The Contractor's attention is directed to the possible existence of pipe and other underground improvements which may or may not be shown on the Drawings. Preserve and protect any such improvements whether shown on the Drawings or not. Expose such improvements in advance of the pipeline construction to allow for changes in the alignment as necessary. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute the work, they shall be removed, maintained, and permanently replaced by the Contractor as directed by the District Representative. Protect existing underground utilities in accordance with Standard Specification Section 02222.

1.07 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Submit a report from a testing laboratory verifying that imported material is asbestos-free and conforms to the specified gradations or characteristics.

1.08 TESTING FOR COMPACTION

- A. The District or the agency having jurisdiction over the area of the work will require the Contractor to test for compaction as described below.
- B. Determine the density of soil in place by the sand cone method, ASTM D 1556, or by nuclear methods, ASTM D 2922 and D 3017.
- C. Determine laboratory moisture-density relations of soils by ASTM D 1557.
- D. Determine the relative density of cohesionless soils by ASTM D 4253 and D 4254.
- E. Sample backfill materials by ASTM D 75.
- F. "Relative compaction" is the ratio, expressed as a percentage, of the in-place dry density to the laboratory maximum dry density.
- G. Make excavation for compaction tests at the locations and to the depths designated by the District's Representative. Backfill and recompact the excavations at completion of testing.

SECTION 02223 – TRENCHING, BACKFILLING, AND COMPACTING

When tests indicate that the compaction is less than the specified relative compaction, rework and retest those areas until the specified relative compaction has been obtained.

1.09 PIPE BASE

The pipe base shall be defined as a layer of material immediately below the bottom of the pipe and extending over the full trench width in which the pipe is bedded. Thickness of pipe base shall be a minimum of 6 inches per OMWD standard drawing number E-2.1.

1.10 PIPE ZONE

The pipe zone shall include the full width of trench from the bottom of the pipe to a horizontal level 12 inches above the top of the pipe. Where multiple pipes are placed in the same trench, the pipe zone shall extend from the bottom of the lowest pipe to a horizontal level above the top of the highest or topmost pipe. Thickness of pipe zone above the highest top of pipe shall be a minimum of 12 inches.

1.11 TRENCH ZONE

The trench zone includes the portion of the trench from the top of the pipe zone to the bottom of the pavement zone or to the existing surface in unpaved areas.

1.12 PAVEMENT ZONE

The pavement zone includes the asphalt concrete and aggregate base pavement section placed over the trench backfill per agency having jurisdiction.

1.13 WATER FOR CONSTRUCTION

Water supplied by the District, for whatever needs and uses, shall be paid for in accordance with the rates and rules of the District. The only exception is by written agreement with the District.

PART 2 - MATERIALS

2.01 NATIVE EARTH BACKFILL--TRENCH ZONE

Native earth backfill used above the pipe zone shall be excavated fine grained materials or loose soil free of asbestos, organic matter, roots, debris, rocks larger than 6 inches in diameter, clods, clay balls, broken pavement, and other deleterious materials. Backfill material shall be so graded that at least 40% of the material passes a No. 4 sieve. The coarser materials shall be well distributed throughout the finer material. Backfill materials that are obtained from trench excavated materials to the extent such material is available, shall be either screened directly into the trench or screened during the trenching operation. If screened during trenching, the material shall be maintained free of unscreened material during the handling and backfilling process. Hand selecting of rocks from earth as it is placed into the trench will not be permitted in lieu of the specified screening. Under no circumstances will native earth backfill be allowed or used in the pipe base or pipe zone areas.

SECTION 02223 – TRENCHING, BACKFILLING, AND COMPACTING

2.02 IMPORTED MATERIAL FOR BACKFILL--TRENCH ZONE

Imported material shall conform to that specified for native earth backfill or imported sand.

2.03 IMPORTED SAND--PIPE BASE AND PIPE ZONE

- A. Imported sand used in the pipe base and pipe zone shall consist of natural or manufactured granular material, or a combination thereof, free of deleterious amounts of organic material, mica, loam, clay, and other substances. Under no circumstances will decomposed granite, rock dust, or native earth backfill be allowed or used in the pipe base or pipe zone areas. Imported sand shall have the following gradation or similar:

Sieve Size	Percent Passing By Weight
3/8-inch	100
No. 4	75 - 100
No. 30	12 - 50
No. 100	5 - 20
No. 200	0 - 15

- B. Imported sand shall have a coefficient of permeability greater than 0.014 measured in accordance with ASTM D2434 or a minimum sand equivalent of 30 per ASTM D2419. Imported sand shall have a saturated resistivity greater than 1,000 ohm-cm, a neutral pH, and chlorides less than 100 ppm.

2.04 CRUSHED ROCK FOR BELOW GROUND INSTALLATIONS

- A. Gravel or crushed rock material shall contain less than 1% asbestos by weight or volume and conform to the Standard Specifications for Public Works Construction, Section 200-1.2 and shall meet the following gradation:

Sieve Sizes	Designated Rock Size			
	1-1/2-Inch	1-Inch	3/4-Inch	3/8-Inch
	Percent Passing	Percent Passing	Percent Passing	Percent Passing
2 inches	100	-	-	-
1-1/2 inches	90 to 100	100	-	-
1 inch	20 to 55	90 to 100	100	-
3/4 inch	0 to 15	30 to 60	90 to 100	-
1/2 inch	-	0 to 20	30 to 60	100
3/8 inch	0 to 5	-	0 to 20	90 to 100
No. 4	-	0 to 5	0 to 5	30 to 60
No. 8	-	-	-	0 to 10

- B. Use 3/4-inch size unless indicated otherwise in the Drawings.

SECTION 02223 – TRENCHING, BACKFILLING, AND COMPACTING

2.05 ROCK REFILL FOR FOUNDATION STABILIZATION

Rock refill shall be crushed or natural rock having the following gradation:

<u>Sieve Size</u>	<u>Percent Passing By Weight</u>
3 inches	100
1-1/2 inches	70 - 100
3/4-inch	60 - 100
No. 4	25 - 55
No. 30	10 - 30
No. 200	0 - 15

2.06 GRANULAR MATERIAL FOR STRUCTURAL BACKFILL

- A. Granular material for structural backfill shall be free of asbestos, organic materials, clay balls, and shall have the following gradation:

<u>Sieve Size</u>	<u>Percent Passing By Weight</u>
3/4-inch	100
1/2-inch	95 - 100
3/8-inch	50 - 100
No. 4	20 - 65
No. 8	10 - 40
No. 40	0 - 20
No. 200	0 - 5

- B. Whenever the phrase “structural backfill material” is used in these Standard Specifications, it shall mean granular material for structural backfill as described above.
- C. Excavated material may be used for structural backfill provided it conforms to the Standard Specifications for structural backfill material.

2.07 REDWOOD BAFFLES

Use merchantable heart garden grade redwood per Standard Specifications for Grades of California Redwood Lumber issued by the Redwood Inspection Service. Provide seasoned or unseasoned redwood and surfaced on four sides.

2.08 WATER FOR COMPACTION

Water used in compaction shall have a maximum chloride concentration of 500 mg/l, a maximum sulfate concentration of 500 mg/l, and shall have a pH of 7.0 to 9.0. Water shall be free of acid, alkali, or organic materials injurious to the pipe or coatings. Salt water will not be allowed.

SECTION 02223 – TRENCHING, BACKFILLING, AND COMPACTING

PART 3 - EXECUTION

3.01 COMPACTION REQUIREMENTS

Unless otherwise shown on the Drawings, otherwise described in the Specifications or required by the agency having jurisdiction over the area of the work, relative compaction in pipe trenches shall be a minimum as follows:

- A. Pipe base--90% relative compaction.
- B. Pipe zone--90% relative compaction.
- C. Backfill above pipe zone not beneath paving--90% relative compaction.
- D. Backfill above pipe zone in existing or new paved areas--95% relative compaction.
- E. Rock refill for foundation stabilization--80% relative density.
- F. Imported sand refill for overexcavation--90% relative compaction.

3.02 SHEETING, SHORING, AND BRACING OF TRENCHES

Trenches shall have sheeting, shoring, and bracing conforming with 29CFR1926, Subpart P-Excavations, CAL/OSHA requirements, and the District's requirements.

3.03 MATERIAL REPLACEMENT

Remove and replace any trenching and backfilling material which does not meet the Specifications, at the Contractor's expense.

3.04 TRENCH WIDTHS

- A. Pipe trench widths in the pipe zone for water pipelines pipe OD + 12" on each side of the pipe.
- B. Trench width at the top of the trench will not be limited except where width of excavation would undercut adjacent structures and footings. In such case, width of trench shall be such that there is at least 2 feet between the top edge of the trench and the structure or footing. Where shoring or encasement is required, trench widths shall be increased accordingly.

3.05 TRENCH EXCAVATION

- A. Perform all excavation regardless of the type, nature, or condition of the material encountered to accomplish the construction. Do not operate excavation equipment within 5 feet of existing structures or newly completed construction. Excavate with hand tools in these areas.
- B. Excavate the trench to the lines and grades shown on the Drawings with allowance for pipe thickness, sheeting and shoring if used, and for pipe base. If the trench is excavated below the required subgrade, refill any part of the trench excavated below the subgrade at no additional cost to the District with imported sand. Place the refilling material over the full width of trench in compacted layers not exceeding 6 inches deep to the established grade with allowance for the pipe base.

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- C. Trench depth shall accommodate the pipe and the pipe base at the elevations shown in the profile on the Drawings. In the absence of such profile, the top of pipe shall be located 4 feet below the surface elevation of the centerline of the street or 3 feet below existing ground at the pipe location, whichever is lower.
- D. Construct trenches in rock by removing rock to a minimum of 6 inches below bottom of pipe and backfilling with imported sand.

3.06 TRENCH EXCAVATION IN BACKFILL OR EMBANKMENT AREAS

Construct trench excavation for pipe or pipes in backfill or embankment areas in accordance with one of the following procedures:

- A. Construct and compact the embankment to an elevation of 1-foot minimum over the top of the largest pipe to be installed. Excavate trench in the compacted embankment. Place pipe base material, install pipe, and backfill with pipe zone material. Construct embankment as specified in the Standard Specification Section 02200.
- B. Excavate trench in the completed backfill or embankment. Place pipe base material, install pipe, and backfill with pipe zone material. Place and compact backfill above the pipe zone to the same relative compaction as the adjacent embankment as specified in the Standard Specification Section 02200.

3.07 LOCATION OF EXCAVATED MATERIAL

During trench excavation, place the excavated material only within the working area or within the areas shown on the Drawings. Do not obstruct any roadways or streets. Conform to federal, state, and local codes governing the safe loading of trenches with excavated material.

3.08 LENGTH OF OPEN TRENCH

- A. Limit the length of open trench to 300 feet in advance of pipelaying or amount of pipe installed in one working day.
- B. Complete backfilling and temporary or first layer paving not more than 120 feet in the rear of pipelaying.
- C. Where pipelines are located beneath or adjacent to existing paved roads, backfill all trenches at the end of each workday and place temporary or first layer of paving. Clean all new and adjacent existing paved surfaces of residual excavated and backfill materials. Perform dust control operations in these areas with a self-loading motor street sweeper with operational spray nozzles at least once each working day for the purpose of keeping paved areas clean.
- D. Where open trenches are not required to be backfilled at the end of the day per these Standard Specifications but in the opinion of the District's Representative pose a hazard to the public, the trench shall be surrounded with temporary chain link fence panels or be backfilled.
- E. Provide ingress and egress to buildings and property at all times. Provide steel covering for vehicular access.

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3.09 TEMPORARY STEEL PLATE BRIDGING

- A. When backfilling operations of an excavation in the traveled way, whether transverse or longitudinal, cannot be properly completed within a workday, provide steel plate bridging with a nonskid surface and shoring to preserve unobstructed traffic flow. In such cases, the following conditions shall apply:
1. Shore the trench to support the bridging and traffic loads.
 2. Steel plates used for bridging shall extend a minimum of 12 inches beyond the edges of the trench.
 3. The pavement shall be cold planed to a depth equal to the thickness of the plate and to a width and length equal to the dimensions of the plate.
 4. Install steel plate bridging to operate with minimum noise.
- B. Maintain the steel plates and shoring.
- C. Unless specified, use of steel plate bridging at any given location shall not exceed four consecutive days in any given week.
- D. The following table shows the required minimal thickness of steel plate bridging required for a given trench width:

Trench Width (feet)	Minimum Plate Thickness (inches)
1	1/2
1-1/2	3/4
2	7/8
3	1
4	1-1/4

- E. For spans greater than 4 feet, prepare a structural design by a registered civil engineer and submit to the District's Representative for review.
- F. Design steel plate bridging for HS20-44 truck loading per Caltrans Bridge Design Specifications Manual. Maintain on the steel plate a nonskid surface having a minimum coefficient of friction equivalent to 0.35 as determined by California Test Method 342. The Contractor may use standard steel plate with known coefficient of friction equal or exceeding 0.35.
- G. Use a Rough Road sign (W33) with black lettering on an orange background in advance of steel plate bridging. This is to be used along with any other required construction signing.

3.10 FOUNDATION STABILIZATION

After the required excavation has been completed, the District's Representative will inspect the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation be conducted in all areas within the influence of the pipeline where unacceptable materials such as soft, spongy or deleterious materials exist at the exposed grade. Overexcavation shall include the removal of all such unacceptable material that exists

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directly beneath the pipeline to a minimum width equal to the maximum trench width and to a depth determined by the District's Representative. Backfill the trench to the established subgrade of the pipe base with rock refill material for foundation stabilization. Place the foundation stabilization material over the full width of the trench and compact in layers not exceeding 6 inches deep to the required grade. Place imported sand on the compacted foundation stabilization and apply water to wash the sand into the voids of the rock refill material. Continue this procedure until the voids of the rock refill have been filled with imported sand. Do not apply water in such quantities that it will damage the integrity of the foundation stabilization. Rock refill material and imported sand may be placed and compacted at the same time.

3.11 TRENCH BACKFILLING

- A. Place the specified thickness of pipe base material (imported sand) over the full width of trench and compact to the specified relative compaction. Grade the top of the pipe base ahead of the pipelaying to provide firm, continuous, uniform support along the full length of the trench for the pipe, fittings, and valves.
- B. Excavate bell holes at each joint to permit proper assembly and inspection of the entire joint. Fill and compact the area excavated for the joints with the pipe base material.
- C. After the pipeline has been bedded and the cement mortar used in the exterior joints has set hard, place pipe zone material (imported sand) simultaneously on both sides of the pipe, fittings, and valves, keeping the level of backfill the same on each side. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or uncompacted areas are left beneath the pipe. Use particular care in placing material on the underside of the pipe to prevent lateral movement during subsequent backfilling. Do not drop sharp, heavy pieces of material directly onto the pipe or the tamped material around the pipe.
- D. After the pipe has been bedded, compact imported sand in the pipe zone using only an air operator powder puff air tamper/compactor or vibratory rammer (jumping jack). Place imported sand backfill material for the pipe zone in uniform layers on each side of the pipe not exceeding 12-inches in thickness or pipe diameter, whichever is less. Compact the layer(s) to the required minimum relative compaction at the optimum moisture content. Care shall be exercised in backfilling and compacting to avoid damage to pipe coatings and polyethylene encasement.
- E. Push the native earth backfill or imported material for backfill carefully onto the imported sand previously placed in the pipe zone. Do not permit free fall of the material until at least 2 feet of cover is provided over the top of the pipe. Do not use compaction equipment with an overall weight in excess of 150 pounds until trench zone backfill has been completed to a depth of 2 feet over the top of pipe.
- F. Place and compact native earth or imported material for backfill in the trench zone in layers not exceeding 12 inches in thickness.

3.12 DISPOSAL OF EXCESS EXCAVATED MATERIAL

Dispose of excess excavated material offsite. Contractor shall make his own arrangements for the disposal of the excess material and bear all costs incidental to such disposal. In open

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terrain, excess material may be disposed of within the right of way by spreading, provided that rocks or lumps which cannot be readily covered by spreading are removed.

3.13 FINAL CLEAN-UP AND REDWOOD BAFFLES

- A. After backfilling, grade the right-of-way to the contours of the original ground and match the adjacent undisturbed ground. Make surfaces free of all cleared vegetation, rubbish and other construction wastes. Dispose of all excavated or surface rocks and lumps which cannot be readily covered by spreading. On slopes 35-percent and steeper or where rainfall would create an erosion problem as determined by the District's Representative, provide redwood baffles across the backfilled trench at the locations shown on the Standard Drawings, Drawings, or as directed by the District's Representative. Place baffles in a vertical position across the backfilled trench and level with the contours of the slope.
- B. Replace in kind street improvements, such as curbs and gutters, barricades, traffic islands, signalization, fences, signs, mail boxes, etcetera that are cut, removed, damaged, or otherwise disturbed by the construction.

3.14 SLOPE PROTECTION

- A. Prepare and seed all open ground within the easement or working area disturbed by the construction, not otherwise protected from erosion, or as determined by the District's Representative. After final clean-up, cultivate areas to be seeded to break up any compaction resulting from grading operations.
- B. The seed mix shall be specifically developed for the area of application and shall be as shown on the Drawings. The intent of this instruction is to provide a seed mix design that is environmentally compatible with the surrounding habitat.

END OF SECTION

SECTION 02743 – ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.1 DESCRIPTION

This Section describes the requirements for materials, testing and placement of aggregate base; asphalt concrete paving and overlays; slurry seal; seal coat for miscellaneous areas; pavement striping, markers and markings and all incidental work.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Specification Section 01300: Record Drawings and Submittals
- B. Section 01545: Protection of Work and Property
- C. Standard Specification Section 02223: Trenching, Backfilling, and Compacting

1.3 DEFINITIONS

Whenever the terms “Public Works Specifications”, “Standard Specifications” or “Greenbook” are used in this Section, the meaning shall be interpreted as Standard Specifications for Public Works Construction by APWA/AGC, The “Greenbook”, latest edition with Regional Supplement Amendments.

Whenever the term “State Standard Specifications” or “Caltrans Standard Specifications” are used in this Section, the meaning shall be interpreted as the Standard Specifications of the State of California, Department of Transportation, latest edition.

1.4 SUBMITTALS

- A. Submit shop drawings in accordance with the General Provisions.
- B. For all paving and sealing work within City of Encinitas public streets, submittals shall be subject to the written approval of the City through the project submittal process.
- C. Mix design of all bituminous mixtures (asphalt concrete, slurry seal, seal coat for miscellaneous areas).
- D. Submit report from a testing laboratory verifying that aggregate material is asbestos-free and conforms to the specified gradations and other physical characteristics specified herein. Submit test results a minimum of 20 working days prior to placement of aggregate base materials.
- E. Delivery tickets for each load of aggregates, aggregate base, asphalt concrete, slurry seal.
- F. Comply with the submittal requirements contained in referenced specifications.
- H. At the pre-construction meeting, the Contractor shall submit Certificates of Compliance for all Aggregate Base, Asphalt Concrete mixtures, Slurry Seal, and materials for pavement striping, markings and markers.

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- I. Prior to the time of delivery of each shipment of any materials to be used in the project, the Contractor shall deliver to the Owner certified copies of all the test results as required by these specifications for those materials to be used (emulsified asphalt, mineral filler, aggregate, etc.). The test reports shall indicate the name of the materials supplier, type and grade of materials to be delivered, date and point of delivery, quantity to be delivered, delivery ticket number, purchase order number and the results of the specified tests. The test reports shall be signed by an authorized representative of the material testing agency and shall certify that the product delivered conforms to these specifications. In addition, the Owner will select three samples of the materials shipped for conformance testing. The testing for these samples shall be provided at no cost to the Contractor, except if the material samples fail any of the tests. In this case, the Contractor shall bear the cost of the testing of those failed samples. No material from that shipment shall be utilized or employed in the performance of the work until certified test reports and samples of the material have been furnished to, checked by and approved by the Owner's Representative. Cost of all testing shall be included in the bid item for the appurtenant item of work and no additional compensation will be made therefor.

1.5 TESTING FOR COMPACTION

- A. The Owner or its testing firm will provide testing for compaction as described herein.
- B. Determine the density of soil in place by the sand cone method, ASTM D1556.
- C. Determine laboratory moisture-density relations of soils by ASTM D1557.
- D. Determine the relative density of cohesionless soils by ASTM D4253 and D4254.
- E. Sample backfill materials by ASTM D75.
- F. "Relative compaction" is the ratio, expressed as a percentage, of the in-place dry density to the laboratory maximum dry density for soils and aggregate. "Relative compaction" of asphalt concrete is the ratio, expressed as a percentage, of the in-place density to the laboratory maximum density per ASTM D2041.
- G. Compaction shall be deemed to comply with the Specifications when no more than one test of any three consecutive tests falls below the specified relative compaction. The one test shall be no more than three percentage points below the specified compaction. The Contractor shall pay the costs of any retesting of work not conforming to the Specifications.

1.6 PAVEMENT CONSTRUCTION IN PUBLIC RIGHT OF WAY

The following requirements shall supplement the San Diego Regional Standards for pavement restoration and shall govern other requirements of this Section.

- A. For work within County of San Diego jurisdiction, comply with the Department of Public Works pavement cut policies and conform to the County of San Diego, Department of Public Works Special Provisions or excavation permits.

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- B. Paving or sealing operations in public streets in the City of Encinitas shall comply with the permit requirements of the City.
- C. Paving of the trench excavations shall be in accordance with City of Encinitas Street Standards, Standard Details S-01 through S-07.

1.7 PRODUCTS

2.1 AGGREGATE BASE

Aggregate base shall be per City of Encinitas Street Standards, Standard Detail S-01B.

Recycled base (made of reclaimed asphalt concrete, Portland cement concrete, lean concrete base, cement treated base, etc.) shall not be used. Furthermore, crushed miscellaneous base as called out in Greenbook Section 200-2.4 shall not be used.

2.2 ASPHALT CONCRETE

A. GENERAL

1. Materials shall meet the requirements of the City of Encinitas Street Standards, and approval of the City of Encinitas.
2. Asphalt concrete for utility trench resurfacing in public streets not under moratorium, unless designated otherwise, shall be per City of Encinitas Standard Drawings S-01A and S-01B, adopted October 2023.
3. Public streets under moratorium require full street width 2" mill and overlay.
4. Thickness of the new pavement shall be equal to the thickness of the existing pavement plus 1 inch.
5. Control of Materials: Materials to be incorporated in the work shall be manufactured, handled and used in a satisfactory manner.
6. Samples: The Owner shall have the right to obtain samples of all such materials to be used in the work and to test such samples for the purpose of determining specification compliance. The Owner reserves the right to obtain said samples at the point of delivery and/or at the point of manufacture. The Owner shall also have the right to inspect sources of materials to be used for the work to determine acceptability of procedures used by the materials supplier.

B. MATERIALS

1. Only materials conforming to these specifications shall be incorporated in the work.
2. Asphalt: The asphalt mix design shall be in accordance with the City of Encinitas Street Standards.

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3. Aggregate: Aggregate for asphalt concrete shall be in accordance with the City of Encinitas Street Standards.
4. Mineral Filler: Mineral filler shall conform to Greenbook Section 203-6.3.3. The amount of mineral filler to be used shall conform to the requirements of the combined aggregate grading. The method of adding the mineral filler shall be such that the aggregate is uniformly coated and the mineral filler is uniformly distributed without loss or waste within the material prior to adding the asphalt to the mixture.
5. Anti-Strip Agents: When aggregate is found to be subject to stripping via prescribed test procedures, dry hydrated lime conforming to the requirements of ASTM C207, or Type N Portland Cement conforming to applicable requirements, or other approved anti-strip agents shall be added.
6. Combined Aggregates: The combined aggregates sampled after all processing, except the adding of asphalt and mineral filler, shall conform to the following requirements:
 - a. The ratio of the percentage of aggregate by weight passing the No. 30 sieve to that passing the No. 8 sieve shall not exceed 65 percent in all dense graded asphalt concrete mixes.
 - b. At least 80 percent by weight of the aggregate retained on the No. 8 sieve shall consist of particles which have at least one rough, angular surface produced by crushing.
7. Composition and Grading: The grading of the combined aggregates shall conform to Greenbook Section 203-6.4.3 for Class C1 (Type III C2 for Section 400-4.3) Asphalt Concrete.
8. Additional Requirements:

The aggregate and mix to be incorporated into the work must also meet the following requirements:

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INDIVIDUAL TEST REQUIREMENTS	
<u>Test</u>	<u>Results</u>
Loss in L.A. Rattler, California Test 211 (after 500 revolutions)	45% max.
Sand Equivalent, California Test 217	50 min.
Stabilometer Value, California Test 366	35 min.
Swell, California Test 305	0.030" max.
Moisture Vapor Susceptibility, California Test 307	25 min.
Air Voids Content (mix)	3% - 5%
Index of Retained Strength, ASTM D1075	60% min.

2.4 PAVEMENT REINFORCEMENT MEMBRANE

Pavement reinforcement membrane shall be per City of Encinitas standards.

2.5 SLURRY SEAL

Slurry seal shall be Rubber Polymer Modified Slurry (RPMS) as described in this Section.

2.6 EMULSION AGGREGATE SLURRY (EAS)

Not used

2.7 RUBBER POLYMER MODIFIED SLURRY (RPMS)

A. GENERAL

This work shall consist of preparation of existing surfaces to receive RPMS, mixing asphaltic emulsions, aggregate, set-control additives, specially produced and graded crumb rubber, and water and spreading the mixture on the pavement in accordance with these specifications.

B. MATERIALS

Materials for RPMS immediately prior to mixing shall conform to the following requirements:

1. Asphaltic Emulsion. Asphaltic Emulsion shall be quick setting Type CQS-1h grade conforming to the requirements of these special provisions. Quick Setting CQS-1h Asphaltic Emulsions shall conform to the following requirements when tested in accordance with the specified test method:

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<u>Test</u>		<u>Requirements</u>
Residue from Distillation	AASHTO T59 ASTM D244	60% minimum
Penetration at 77°F (25°C)	AASHTO T49 ASTM D2397	40%-90%

In addition, quick setting Type CQS-1h Asphaltic Emulsion shall test Positive for Particle Charge when tested in accordance with AASHTO T59. If the Particle Charge Test result is inconclusive the Asphaltic Emulsion shall meet a pH requirement of 6.7 minimum.

2. Aggregate. The mineral aggregate used shall be the type and grade specified for Type II RPMS surfacing. The aggregate shall be manufactured crushed stone such as granite, slag, limestone, chat, or other high quality aggregate, or combination thereof. Aggregate shall consist of rock dust except that 100 percent of any aggregate of combination of aggregates, larger than the No. 50 sieve size, used in the mix shall be obtained by crushing rock. The material shall be free from vegetable matter and other deleterious substances. All aggregate shall be free of caked lumps, and oversized particles.
3. Quality Tests. The percentage composition by weight of the aggregate shall conform to the following gradings when determined by California Test 202, modified by California Test 105 when there is a difference in specific gravity of 0.20 or more between blends of different aggregates.

TYPE II RPMS GRADATION		
<u>Sieve Size</u>	<u>Percent Passing</u>	<u>Stockpile Tolerance</u>
No. 3/8	100	5%
No. 4	90-100	5%
No. 8	65-90	5%
No. 16	45-70	5%
No. 30	30-50	5%
No. 50	18-36	4%
No. 100	10-24	3%
No. 200	5-15	2%

The job mix (target) gradation shall be within the gradation band for the Type II RPMS. After the target gradation has been submitted, the percent passing each sieve shall not vary by more than the stockpile tolerance.

The aggregate shall also conform to the following requirements:

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<u>Test</u>	<u>California Test</u>	<u>Requirements</u>
Sand Equivalent	217	45 min.
Durability Index	229	55 min.

The aggregate will be accepted at the job location or stockpile. The stockpile shall be accepted based on five gradation tests according to California Test 202, modified by California Test 105 when there is a difference in specific gravity of 0.2 or more between blends of different aggregates. If the average of the five tests is within the gradation tolerance, then the material will be accepted. If the test shows the material to be out of gradation tolerances, the Contractor shall be given the choice to either remove the material or blend other aggregates with the stockpile material to bring it into specifications. Materials used in blending must meet the quality test before blending and must be blended in a manner to produce consistent gradation.

When the results of either the Aggregate Grading or the Sand Equivalent test do not conform to the requirements specified, the aggregate shall be removed. No single aggregate grading or sand equivalent tests shall represent more than 300 tons or one day’s production, whichever is smaller.

4. Water. Water shall be potable and of such quality that the asphalt will not separate from the emulsion before the slurry seal is in place in the work. If necessary for workability, a set-control agent that will not adversely affect the RPMS material may be used. Pre-wetting of streets will not be required unless streets are subject to high temperatures and/or dust.
5. Crumb Rubber. Crumb rubber shall be ambient granulated or ground from whole passenger and/or truck tires only. Uncuring or devulcanized rubber shall not be acceptable and shall not be used. Rubber tire buffing from either recapping or manufacturing processes shall not be used as a supplement to the crumb rubber mixture.

In order to remove steel and fabric, an initial separation stage which subjects the rubber to freezing temperatures may be used. The crumb rubber shall not be elongated or hair-like in shape and individual particles shall not be greater than 1/20 of an inch in length. The crumb rubber shall be free of contaminants including fiber, metal and mineral matter to the following tolerances:

- a. The fiber content shall be less than 0.30% by weight.
- b. The crumb rubber shall be free of metal particles. Metal imbedded in rubber particles shall not be allowed. The amount of mineral contaminants allowed shall not exceed 0.10% by weight.
- c. The crumb rubber shall be dry with a moisture content of less than 0.75%.

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CRUMB RUBBER CHEMICAL PROPERTIES	
<u>Property</u>	<u>Specification Limits</u>
Specific Gravity, ASTM D1817	1.15 +/- .05
Percent Carbon Black, ASTM D297	35.0 Maximum
Percent of Rubber Hydrocarbon, ASTM D297	55.0 Maximum
Percent Ash, ASTM D297	6.0 Maximum
Percent of Acetone Extract, ASTM D297	10.0 Maximum
Percent of Chloroform Extract, ASTM D297	3.0 Maximum
Percent Natural Rubber, ASTM D297	40 Minimum

CRUMB RUBBER GRADATION REQUIREMENTS (ASTM D1511 or C136)	
<u>Sieve Size</u>	<u>Percent Passing</u>
No. 30	100
No. 40	90-100
No. 50	75-85
No. 100	25-35
No. 200	0-10

6. Properties. The Polymer additive shall be SBR Latex or approved equal, which is added at a minimum of 2.0 percent by weight of the asphaltic emulsion.
7. Carbon Black. The carbon black solution shall be non-ionic in charge and liquid in form. The carbon black shall be compatible with the emulsion system, polymers and additives being used.

<u>Property</u>	<u>Tolerances</u>
Total Solids	40-44
% Black by Weight	35-37
Type Black	Medium Furnace Color
Type Dispersing	Non-ionic

8. Mineral Filler. Portland Cement, hydrated lime, limestone dust, fly ash or other approved filler meeting the requirements of ASTM D242 shall be used if required by the mix design and may be used to facilitate set times as

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needed. Any cement used shall be considered as part of the dry aggregate weight for mix design purposes.

9. Additive. Additives may be used to accelerate or retard the break-set of the RPMS. The use of additives shall be in quantities specified in the mix design.
10. Laboratory Evaluation. Before work begins, the Contractor shall submit a mix design covering the specific materials to be used on the project. The design shall be performed by a laboratory that has at least two years' experience in designing RPMS. After the mix design has been approved, no substitution will be permitted unless approved by the Owner's Representative.
11. Mix Design. The proposed RPMS mix design shall verify compatibility of the aggregate, emulsion, mineral filler, set-control additive and rubber blend. Recommend tests and values are as follows:

<u>Test</u>	<u>Description</u>	<u>Specification</u>
ISSA T-106	Slurry Seal Consistency	Pass
ISSA TB-109	Excess Asphalt	50 grams per square foot maximum
ISSA TB-100 (Type II)	Wet Track Abrasion	60 grams per square foot maximum
ISSA TB-113	Mixing Time	Controllable to 150 seconds minimum
ISSA TB-114	Wet Stripping	Pass

The Mixing Time test shall be done at the highest temperatures expected during construction. The original lab report shall be signed by the laboratory that performed the mix design and shall show the results of tests on individual materials. The report shall clearly show the proportions of aggregate, mineral filler (minimum and maximum), water (minimum and maximum), additive(s) (usage), asphaltic emulsion and asphalt rubber blend based on the dry weight of the aggregate.

All of the component materials used in the mix design shall be representatives of the materials proposed by the Contractor to be used on the project. The percentage of each individual material required shall be shown in the laboratory report. Adjustments may be required during the construction, based on field conditions.

The component materials shall be within the following limits:

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Residual Asphalt Type II	7.5%-13.5% Based on dry weight of aggregate
Crumb Rubber	The crumb rubber will be added to the Rubberized Slurry mix at a rate of 5% by volume to the asphalt cement.
Polymer	Polymer Additive shall be added at 2% of finished emulsion.
Carbon Black	Carbon Black shall be added at 1.3% to 2% of the finished emulsion
Mineral Filler	0.5%-2.0% (if required by mix design). Based on dry weight of aggregate.
Additives	As needed.
Water	As needed to achieve proper mix consistency. (Total mix liquids should not exceed the loose aggregate voids).

C. PRODUCTION AND APPLICATION

1. Proportioning. Aggregates, asphaltic emulsion, water, polymers, additives, including set-control agent, if used, and crumb rubber shall be proportioned by volume utilizing the mix design approved by the Owner’s Representative. If more than one kind of aggregate is used, the correct amount of each kind of aggregate to produce the required grading shall be proportioned separately, prior to the other materials of the mixture, in a manner that will result in a uniform and homogeneous blend.
2. The complete mixture, after addition of water and any set-control agent used, shall be such that the mixture has proper workability, and (a) will permit traffic flow, without pilot-car-assisted traffic slurry seal within one hour after placement (at 78°F) without the occurrence of bleeding separation or other distress, and (b) will prevent development of bleeding, excessive raveling, separation or other distress within 7 calendar days after placing the rubberized asphalt surfacing.
3. Spread rate for Type II RPMS shall be placed at 13.33 pounds per square yard based on dry aggregate weight.
4. Asphaltic emulsion shall be added at a rate within the following ranges of percent by weight of the dry aggregate. The exact weight will be determined by the mix design and the asphalt solids content of the asphaltic emulsion furnished.

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<u>Type of Aggregate</u>	<u>Asphaltic Emulsion, % of Dry Aggregate Wt.</u>
Type II	14-17

5. Pneumatic rolling is required on all streets receiving RPMS. Rolling will commence as soon as the RPMS has set sufficiently to prevent any material from adhering to tires. The RPMS surface shall be rolled by two to five coverages, or as directed by the Owner’s Representative. Pneumatic rollers shall be operated at a minimum tire pressure of 60 psi.
6. Aggregate shall be proportioned by a belt feeder operated with an adjustable cutoff gate. The height of the gate opening shall be readily determinable. The emulsion shall be introduced into the mixer by a positive-displacement pump. Water shall be introduced into the mixer through an adjustable pugmill bar (**Pugmill process is acceptable for RPMS**). Water volume shall be displayed by an electric digital meter registering in gallons delivered.
7. The bitumen ratio, (pounds of asphalt per 100 pounds of dry aggregates), shall not vary more than 1.5 pounds of asphalt above or 0.6 pound asphalt below the amount designated by the mix design and approved by the Owner’s Representative.
8. The aggregate belt feeder shall deliver aggregate to the pugmill mixed with such volumetric consistency that the deviation for any individual aggregate delivery rate check-run shall be within 2 percent of the mathematical average of 3 runs of at least 300 gallons each in duration.
9. Each Rubberized Slurry surfacing unit shall be designed to store and deliver the various required materials to a twin-shafted, multi-paddle pugmill in the following manner.
10. Each Rubberized Slurry surfacing unit shall be equipped with a computer controlled automatic sequencing system that initiates each material delivery at the precise moment necessary to ensure proper proportioning.
11. Each Rubberized Slurry surfacing unit shall be equipped with independent storage capabilities for the aggregate, emulsion, crumb rubber, polymer, set-control additives and the carbon black.
12. The polymer additive and the carbon black shall be delivered to the mixer in the relative proportions required by means of a common shaft, dual pump system. The polymer additive and the carbon black flow rates shall be independently adjustable by means of diaphragm valves and shall be sequenced through the computer controlled automatic sequencing system. The polymer additive and the carbon black shall be blended and mixed prior to their introduction into the pugmill. Introduction into the twin-shafted pugmill shall be done through an injection system, which delivers the blended

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material to the apex of each mixing shaft immediately prior to the introduction of the asphalt emulsion. The polymer additive and the carbon black delivery system shall each be equipped with digital electronic flow metering devices that can read in gallons per minute.

13. The crumb rubber delivery system shall be equipped with an air suspension unit designed to prevent clumping or bridging of the rubber material. The air discharges shall be sequenced to avoid over-suspension of the rubber. The rubber shall be delivered to the pugmill by a hydraulically driven auger and shall be initiated through the computer controlled auto-sequencing system.
14. The rubberized asphalt slurry surfacing shall be mixed in a continuous, twin shaft, multi-paddle pugmill mixer. The pugmill shall be equipped with a hydraulically controlled steel pugmill gate for positive discharge operations. No dripping slurry shall be allowed.
15. The emulsion shall be introduced into the mixer by a positive displacement pump. The emulsion storage shall be equipped with a device which will automatically shut down the power to the emulsion pump and aggregate belt feeder when the level of stored emulsion is lowered to within two inches of the suction line.
16. A temperature-indicating device shall be installed in the emulsion storage tank at the pump suction level.
17. The aggregate shall be proportioned using a belt feeder operated with an adjustable cutoff gate. The height of the gate opening shall be readily determinable.
18. The aggregate feeder shall be directly connected to the drive on the emulsion pump. The drive shaft of the aggregate feeder shall be equipped with an electronic digital belt. The belt delivering the aggregate to the pugmill shall be equipped with a device to monitor the depth of the aggregate being delivered to the pugmill. The device for monitoring depth of aggregate shall automatically shut down the power to the aggregate belt feeder whenever the depth of the aggregate is less than 70 percent of the target depth of flow. An additional device shall monitor movement of the aggregate belt by detecting revolutions of the belt feeder. The devices for monitoring no flow or belt movement, as the case may be, shall automatically shut down the power to the aggregate belt when the aggregate belt movement is interrupted.
19. To avoid shutdown caused by normal fluctuations in delivery rates, a delay of three seconds between sensing less than desirable storage levels of aggregate or emulsion shall be permitted.
20. Water delivery shall be adjusted through a diaphragm valve. Water flow rate shall be electronically displayed through a digital meter.
21. The mixer unit shall not be operated unless all electronic display and revolution counters are in good working condition and functioning and all

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metal guards are in place. All indicators required by these specifications shall be operational at all times.

22. The RPMS mixture shall be spread by means of a controlled spreader box. The spreader box shall be capable of spreading traffic lane width and shall have strips of flexible rubber belting or similar material on each side of the spreader box and in contact with the pavement to positively prevent loss of slurry from the ends of the box. All spreader boxes shall be equipped with reversible motor-driven augers when placing the RPMS. Rear flexible strike-off blades shall make close contact with the pavement, and shall be capable of being adjusted to the various crown shapes so as to apply a uniform surfacing coat. Flexible drags, to be attached to the rear of the spreader box, shall be provided as directed by the Owner's Representative. All drags and strike-off blades (rubbers) shall be cleaned daily if problems with cleanliness and longitudinal scouring occur. The spreader box shall be clean, free of all slurry and emulsion, at the start of each workday.

2.8 ASPHALT RUBBER CRACK SEALANT

A. GENERAL

Crack sealant shall be applied to all cracks in existing paving that are 1/4-inch in width or wider in areas to receive a paving overlay or slurry seal.

B. MATERIALS

1. The crack sealant shall consist of a mixture of paving grade asphalt and vulcanized granulated crumb rubber. The mixture shall contain not less than 25% granulated reclaimed rubber, by weight. Rubber gradation shall conform to the following requirements:

<u>Sieve Size</u>	<u>Percent Passing</u>
No. 8	100
No. 10	98-100
No. 30	--
No. 40	0-10

The sealant shall conform to the following requirements:

Cone Penetration, 77 °F, 0.1 mm, ASTM D5329	40 max.
Softening Point, °F, ASTM D36	175 min.
Resilience, 77 °F, % Rebound, ASTM D5329	30 min.

The sealant shall be capable of being melted and applied to cracks at temperatures below 400 °F. When heated, the material shall readily penetrate cracks 1/4-inch in width or wider.

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Modifiers may be used to facilitate blending.

2. Control of Materials: Each lot of sealant shipped to the job site shall be accompanied by a Certificate of Compliance as provided in Section 6-1.07 of the State Standard Specifications (2010 edition), and shall be accompanied by storage instructions, heating instructions, and caution instructions.
3. Accelerator or Retardant: The retardant shall be the type stated in the job mix formula and shall be approved by the Owner's Representative before use. The amount of accelerator to be included in the mixture shall be that amount necessary to ensure the applied crack seal can support vehicular traffic within four (4) hours after the last application.

2.9 PRIME COAT

All areas to be paved shall receive a prime coat of SC 250 liquid asphalt conforming to Greenbook Section 203-2.

2.10 TACK COAT

Tack coat shall consist of SS-1h emulsified asphalt per Greenbook Section 203-3.4.2 shall be applied in conformance with the applicable requirements of the Greenbook to all exposed asphalt surfaces and gutter front face.

2.11 TRAFFIC STRIPING, PAVEMENT MARKINGS AND RAISED MARKERS

A. GENERAL

1. New Striping and Legends: Materials (paint and thermoplastic), equipment, mixing (paint), surface preparation, application and tolerances, shall conform to Sections 84-1 and 84-3 of the State of California, Department of Transportation's Standard Specifications (2010 edition) except as modified herein.
2. Pavement markers shall conform to Section 85 of the State of California, Department of Transportation's Standard Specifications (2010 edition).
3. All details and dimensions for pavement markings shall conform to City approved stencils.
4. All details and dimensions for traffic striping shall conform to the least edition of the State of California, Department of Transportation's Traffic Design Manual and Maintenance Manual.
5. Contractor must obtain City approval from the City's Traffic Engineer on the striping layout prior to applying and permanent striping.
6. All traffic stripes and pavement markings shall be reflectorized. The Contractor shall apply two coats on all traffic striping.

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7. The Contractor shall be responsible to mark and/or document the types and limits of existing striping, pavement markings and pavement markers in a manner adequate to ensure their replacement in original location, alignment, color size, and/or type. Control of alignment and layout shall be the responsibility of the Contractor and subject to approval by the Owner's Representative. Raised markings for fire hydrants shall be replaced in kind at all locations.

B. MATERIALS

1. Paint: Traffic line paint shall be rapid dry paint and shall contain reflective material conforming to Section 84-1 and 84-3 of the Caltrans Standard Specifications. Paint shall comply with all application of local air pollution control regulations.
2. Glass spheres for traffic paint shall conform to State Material Specifications 751-80-34.
3. Samples of traffic striping and pavement marking materials shall be submitted to the Owner's Representative at least two weeks prior to application.
4. Markers: Pavement marker height shall be 0.70-inch minimum. "Low profile" type markers will not be acceptable. Markers shall be of the type and colored to match the existing pavement markers.

PART 2 - EXECUTION

3.1 GENERAL

- A. Comply with the ordinances, directives, and regulations of the respective agencies having jurisdiction over the area of the work. Pavement removal and replacement shall be in accordance with Greenbook Section 302-5, these Specifications and the issued permit.
- B. Pavements shall be protected from damage by the Contractor's operations by the use of trench plates, protective mats, rubber-tired equipment, and/or reduced payloads for exported or imported materials. The Contractor shall submit the proposed method for the protection of pavements prior to mobilization onto the site, shall document the existing pavement conditions by video and inform the Owner of distressed pavement areas that exist prior to mobilization, and shall not commence excavation activities until the method of pavement protection is accepted, in writing, by the Owner. Acceptance by the Owner does not relieve the Contractor from the responsibility to implement measures to protect existing pavements from damage, and pavements that are damaged because of the Contractor's failure to implement reasonable measures for their protection, in the sole opinion of the Owner, shall be replaced by the Contractor at no additional expense to the Owner.

3.2 PAVEMENT REMOVAL

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- A. Initially cut asphalt concrete pavement with a pavement saw, hydrohammer, or pneumatic pavement cutter at the limits of the excavation and remove the pavement regardless of the thickness. After backfilling the excavation, saw cut asphalt concrete pavement to a minimum depth of 2 inches at a point not less than 12 inches outside the limits of the excavation or the previous pavement cut, whichever is greater, and remove the additional pavement.
- B. Saw cut concrete pavement, including cross gutters, curbs and gutters, sidewalks, and driveways, to a minimum depth of 1-1/2 inches and 12 inches beyond the edge of the excavation and remove the pavement. The concrete pavement may initially be cut at the limits of the excavation by other methods prior to removal and then saw cut after backfilling the excavation. If the saw cut falls within 3 feet of a concrete joint or pavement edge, remove the concrete to the joint or edge.
- C. Make arrangements for and dispose of the removed pavement.
- D. Pavement saw cuts shall be straight along both sides of trenches, parallel to the pipeline alignment, and provide clean, solid, vertical faces free from loose material. Saw cut and remove damaged or disturbed adjoining pavement. Final pavement saw cuts shall be parallel to the roadway centerline or lane striping or perpendicular to same.
- E. Removed pavements shall be taken to a local Class C or Class D Recycling Facility. The Contractor shall provide the Owner with a report that documents the place of disposal and the amount of recycled material that was diverted to the facility.

3.3 PREPARATION OF SUBGRADE

- A. Compact the top 12 inches of subgrade to 95 percent relative compaction. Remove all soft material disclosed by the compacting and replace with suitable material and recompact.
- B. The finished subgrade shall be within a tolerance of +/-0.08-foot and shall be smooth and free from irregularities and at the specified relative compaction. The subgrade shall be considered to extend over the full width of the base course.

3.4 PLACING AGGREGATE BASE

- A. Place aggregate base course to a thickness of 6 inches or to the standards of the agency having jurisdiction over the area of the work in accordance with Greenbook Section 301-2. Compact to 95 percent relative compaction.
- B. Apply water uniformly throughout the material and prior to placement and compaction to provide moisture for obtaining the specified compaction.
- C. Compaction and rolling shall begin at the outer edges of the surfacing and continue toward the center. Compact each layer to the specified relative compaction before placing the next layer.

3.5 APPLYING PRIME COAT

SECTION 02743 – ASPHALT CONCRETE PAVING

Apply prime coat to the compacted surface of the aggregate base course per Greenbook Section 302-5.3.

3.6 APPLYING TACK COAT

Apply tack coat to all exposed asphalt or concrete surfaces, including gutter front face, to receive asphalt concrete pavement per Greenbook Section 302-5.4.

3.7 SURFACE PREPARATION OF AREAS TO RECEIVE PAVING OVERLAY OR SLURRY SEAL

- A. Prior to the placement of crack sealant, asphalt concrete pavement or slurry seal, the Contractor shall have a company or person who is licensed by the State of California in herbicide application apply herbicide to all cracks and lips of gutter which have vegetation in them. The herbicide shall consist of Roundup or approved equal with a color dye in it on all cracks and lips of gutter on streets to receive overlay or slurry seal. In addition, apply the approved herbicide along the entire stretch between the lip of gutter and pavement on all streets to receive overlay or slurry seal. The herbicide shall be applied in accordance with the manufacturer's recommendations and at least ten (10) working days prior to crack sealing.
- B. At least five (5) working days after application of the herbicide, the Contractor shall remove all dead vegetation from the cracks and between the lip of gutter and pavement of all streets.
- C. Existing pavement markers shall be removed from areas to receive slurry seal or paving overlays and disposed of.
- D. Cracks of 3/8-inch or greater in width shall be cleaned and sealed with a rubberized crack sealant conforming to the requirements of this Section. Cracks shall be cleaned to a minimum depth of 3/4-inches prior to the crack sealant application to provide an intact bonding surface which is free from all dust, moisture or other contaminants. Cracks shall be cleaned by blast-cleaning or by hand methods and then cleaned with high pressure air jets to remove all residue and foreign materials. Exposed surfaces shall be dry at the time the crack sealant is applied.
- E. Rubberized crack sealant shall be heated and placed in conformance with the manufacturer's written instructions. Joint sealant materials shall not be placed when the pavement surface temperature is below 50°F.
- F. The Contractor shall sweep and clean the existing pavement surface prior to application of the SS-1h tack coat for asphalt concrete overlay or prior to application of slurry seal.

3.8 PLACING ASPHALT CONCRETE PAVING

- A. Producing, hauling, placing, compacting, and finishing of asphalt concrete shall conform to Greenbook Section 302-5.

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- B. Place asphalt concrete to a total thickness of 4 inches or 1 inch thicker than adjacent pavement section, whichever is greater or to the standards of the agency having jurisdiction over the area of the work.
- C. New asphalt concrete shall be placed against existing asphalt concrete along neat, solid surfaces of pavement saw cuts. Placement of new asphalt concrete along a previous saw cut which has been roughened by cold milling or otherwise surface shall not be permitted.
- D. Compact until roller marks are eliminated and minimum relative compaction of 95 percent has been attained per ASTM D2041.
- E. Backfill, compaction, and the permanent paving, except for the final asphalt surface course, shall be complete at all times to a point not to exceed 420 feet behind pipelaying unless otherwise specified or approved by the Owner.
- F. After the base course of asphalt concrete pavement has been completed, place temporary striping in the same configuration as the existing permanent striping so that traffic can be returned to normal patterns. This striping shall be considered temporary and is the Contractor's responsibility to place and maintain.
- G. The final asphalt surface course thickness and width shall be per the City of Encinitas standards. A pavement reinforcement membrane shall be placed underneath the final asphalt surface course per the manufacturers' recommendations and in accordance with the City of Encinitas standards. Do not place final surface course until all pipelines and appurtenances have been installed within the roadway or as directed by the Owner's Representative to maintain traffic safety.

3.9 APPLYING PAVEMENT STRIPING, MARKINGS AND RAISED MARKERS

- A. Two coats of striping paint shall be applied for all street striping. The first coat shall be applied a minimum of seven days after paving is complete. The second coat shall be applied seven days after the first coat is applied. The maximum thickness of the two coats combined shall not be greater than 18 mils when completely dried.
- B. All crosswalks, legends and stop bars shall be thermoplastic. **At each intersection the contractor shall be responsible for applying thermoplastic to all crosswalks in that intersection including those in the intersection which are on side streets that will not receive overlay.**
- C. Pavement marking shall commence a minimum of seven days after the overlay is complete. Any new pavement overlay must receive immediate temporary markings (i.e., temporary tabs, etc.) as directed by the Owner's Representative after any portion of the overlay work is completed. All temporary striping and/or markings shall be maintained by the Contractor until the permanent striping is done.
- D. The Contractor shall remove any temporary tabs remaining at the application of the second coat of paint.

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- E. Pavement Markers: After the application of all pavement striping and markings, install markers on new paved surfaces and existing surfaces that were damaged by construction. Use markers that match the color or combination of colors of the existing markers within the area of work. Install markers along the alignment and match spacing of the existing.
- F. Hydrant Markers: Install a blue reflective marker opposite each new or relocated fire hydrant. Place the marker on the pavement and locate 6 inches off the centerline of the traffic striping or pavement markers and towards the hydrant. Where existing fire hydrants have been relocated or removed from service, dislodge the existing blue marker from the pavement and dispose.

3.10. TRAFFIC CONTROL

- A. Contractor shall be responsible for maintaining safe traffic operation through the work area. Traffic control shall conform to Section 01550 – Site Access and City of Encinitas requirements.
- B. In addition to access restrictions required by Section 01550 – Site Access and City of Encinitas approved traffic control plans, the following restrictions shall also apply:
 - 1. Access to fires hydrants shall be maintained at all times.
 - 2. If it is necessary to restrict access to roadside properties, the Contractor shall first obtain written authorization from the Owner’s Representative and the City of Encinitas Engineer. Upon approval, Contractor shall notify affected property owners a minimum of 72 hours prior to the restriction. Access to all properties shall be restored after the work is completed or at the close of the working day, whichever is first. Restricted access shall not exceed 1 hour for work adjacent to residences at any time of day.
 - 3. The Contractor shall exercise care to prevent public traffic from tracking or smearing freshly painted areas. The Owner’s Representative shall have the option of requiring the Contractor to remove, by wet sandblast method, and repaint all tracked or smeared areas at Contractor’s expense.

3.12. PAVING LIMITS

- A. Paving limits are as indicated on the plans and per City of Encinitas Street Standards.

END OF SECTION

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SECTION 03000 – GENERAL CONCRETE CONSTRUCTION

SECTION 03000 GENERAL CONCRETE CONSTRUCTION

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, installation, and testing of formwork, reinforcing steel, joints, concrete, and finishing and curing for general concrete construction.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Painting and Coating: STD SPEC 09900.

1.03 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Submit manufacturer's catalog data and descriptive literature for form ties, spreaders, corner formers, form coatings and curing compound, bond breakers, joint sealant, backing rod, joint filler, control joints, expansion joint dowels, epoxy bonding compound, floor hardener, color additive, and rapid set cement.
- C. Submit mill test certificates identifying chemical and physical analyses of each load of reinforcing steel delivered. If mill test reports are unavailable and the quantity of steel for a structure exceeds 5 tons, provide a laboratory test to prove conformance with the specified ASTM standard.
- D. Submit reinforcing bending lists and placing drawings for all reinforcing. Placing drawings shall indicate all openings (mechanical, electrical, equipment, and architectural) including additional reinforcing at openings and corner bar arrangements at intersecting beams, walls, and footings indicated in the typical detail and structural drawings. Placing drawings shall be coordinated with the concrete placing schedule. Each bending list and placing drawing submitted shall be complete for each major element of a structure (grade slabs, footings, walls, deck, floor, or roof slabs) including dowels and corner bars. Furnishing such lists shall not be construed that the lists will be reviewed for accuracy. The Contractor shall be wholly and completely responsible for the accuracy of the lists and for furnishing and placing reinforcing steel in accordance with the details shown on the plans and as specified.
- E. Submit concrete mix design at least 15 days before placing concrete. Sources of all materials and certifications of compliance with specifications for all materials. Mix design shall include certified current (less than 1 year old) chemical analysis of the Portland Cement and fly ash or slab cement to be used. Mix design shall include manufacturer's data on all admixtures stating compliance with the required standards.

SECTION 03000 – GENERAL CONCRETE CONSTRUCTION

- F. Proposed procedures for protection and curing of concrete under normal conditions, wet weather placement conditions, hot weather conditions, and cold weather conditions. Including proposed method of measuring concrete surface temperature changes.
- G. Submit six copies of a report from a testing laboratory verifying that aggregate material contains less than 1% asbestos by weight or volume and conforms to the specified gradations or characteristics.

PART 2 - MATERIALS

2.01 FORMWORK

- A. Design forms according to ACI 347. Design and engineering of formwork and safety considerations during construction shall be the responsibility of the Contractor.
- B. Class I Forms: Use steel forms, ply form, or smooth-surface plywood 3/4-inch minimum thickness for straight surfaces and 1/2-inch minimum thickness for curved surfaces.
- C. Class II Forms: Use plywood in good condition, metal, or smooth-planed boards free from large or loose knots with tongue and groove or ship lap joints. Forms shall be oiled.
- D. Class II forms may be used for exterior concrete surfaces which are 1 foot or more below finished grade. Use Class I forms for all other surfaces.

2.02 BOND BREAKER

Bond breaker shall be a non-staining type which will provide a positive bond prevention, such as Williams Tilt-Up Compound, as manufactured by Williams Distributors, Inc., Seattle, Washington; Silcoseal 77, as manufactured by SCA Construction Supply Division, Superior Concrete Accessories, Franklin Park, Illinois; or District approved equal.

2.03 FORM RELEASE AGENT

- A. Form release agent shall effectively prevent absorption of moisture and prevent bond with the concrete. Agent shall be non-staining and nontoxic after 30 days.
- B. For steel forms, release agent shall prevent discoloration of the concrete due to rust.

2.04 REINFORCING STEEL

- A. Reinforcement shall conform to ASTM A 615, Grade 60.
- B. Fabricate reinforcing in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute. Bend reinforcing steel cold.
- C. Deliver reinforcing steel to the site bundled and tagged with identifying tags.

2.05 WELDED WIRE FABRIC

Welded wire fabric shall conform to ASTM A 185.

SECTION 03000 – GENERAL CONCRETE CONSTRUCTION

2.06 TIE WIRE

Tie wire shall be 16gauge minimum, black, soft annealed and not come within 2” of any form. Tie wires shall be bent away from the forms to provide specified concrete coverage.

2.07 BAR SUPPORTS

Bar supports in beams and slabs exposed to view after form stripping shall be galvanized and plastic coated. Use concrete supports for reinforcing in concrete placed on grade.

2.08 BAR COUPLERS

Reinforcing steel bar splicing couplers shall be a mechanical type as manufactured by Dayton Barsplice Inc. or District approved equal. Use couplers which do not reduce tensile or ultimate strength of bars.

2.09 JOINT SEALANT

Joint sealant shall be a multipart, gray, non-staining, non-sagging, polyurethane sealant, which cures at ambient temperature to a firm, flexible, resilient, tear-resistant rubber. Sealant shall be RC 270 of Products Research and Chemical Corporation, Mameco International Vulkem 227, Multi-Chem MC287, or District approved equal.

Technical Requirements

Consistency	Gun grade
Tack free time	24 hours at 75°F and 50% R.H.
Pot life	1 to 3 hours
Hardness	35 Shore A, ±5
Elongation	700%
Tensile strength, ASTM D 412	300 psi
Peel strength on concrete	No loss of bond after 24 hours at 150% elongation
Temperature service range	-40°F to +175°F
Immersion in water	Continuous

2.10 BACKING ROD FOR EXPANSION JOINTS

Backing rod shall be an extruded closed-cell polyethylene foam rod, such as Minicel backer rod, manufactured by Industrial Systems Department, Plastic Products Group of Hercules, Inc., Middletown, Delaware; Ethafoam SB, as manufactured by Dow Chemical Company, Midland, Michigan; or District approved equal. The rod shall be 1/4-inch larger in diameter

SECTION 03000 – GENERAL CONCRETE CONSTRUCTION

than the joint width. Where possible, provide full length sections for the joint; minimize splices. Apply backup rod and bond breaker tape in expansion joints.

2.11 BOND BREAKER TAPE

Bond breaker tape shall be an adhesive-backed glazed butyl or polyethylene tape which will adhere to the premolded joint material or concrete surface. The tape shall be the same width as the joint. The tape shall be compatible with the sealant.

2.12 PREFORMED CONTROL JOINT

Prefomed control joint shall be a one-piece, flexible, PVC joint former, such as Kold-Seal Zip-Per Strip KSF-150-50-50, manufactured by Vinylex Corp., Knoxville, Tennessee, or a one-piece steel strip with preformed groove, such as Keyed Kold Retained Kap, manufactured by Burke Concrete Accessories, Inc., San Mateo, California, or District approved equal. Provide the preformed control joint material in full length unspliced pieces.

2.13 PREMOLDED JOINT FILLER

Joint filler shall be preformed, non-extruded type constructed of closed-cell neoprene conforming to ASTM D 1752, Type I, as manufactured by W. R. Grace Company of Cambridge, Massachusetts; W. R. Meadows, Inc., Elgin, Illinois; or District approved equal.

2.14 STEEL EXPANSION JOINT DOWELS

- A. Steel expansion joint dowels shall conform to one of the following:
- B. Epoxy coated steel bar dowels with a 12-mil coating thickness. Steel bar dowels shall conform to ASTM A 36 or ASTM 615, plain rounds, Grade 40. Epoxy coating shall be in conformance with ASTM A 775; or
- C. Stainless steel bar dowels conforming to ASTM A 276, Type 302.
- D. Exposed portion of expansion joint dowels shall be thoroughly greased prior to casting of adjoining wall or slab.

2.15 CEMENT

Cement shall conform to ASTM C 150, Type II, with maximum tricalcium aluminate and tetracalcium aluminoferrite, not to exceed 8% and 12% respectively. The maximum percent alkalis shall not exceed 0.6%.

2.16 WATER

- A. Water used for mixing concrete shall be clear, potable, and free from deleterious substances such as objectionable quantities of silty organic matter, alkali, salts, and other impurities.
- B. Water shall meet requirements of ASTM C 1602.

SECTION 03000 – GENERAL CONCRETE CONSTRUCTION

2.17 AGGREGATES

- A. Aggregates shall comply with ASTM C 33 and shall contain less than 1% asbestos by weight or volume and be free from any substances that will react with the cement alkalis.
- B. Fine Aggregate (Sand) in the various concrete mixes shall consist of natural or manufactured siliceous sand, clean and free from deleterious substances, and graded within the limits of ASTM C 33.
- C. Coarse aggregates shall consist of hard, clean, durable gravel, crushed gravel, or crushed rock. Coarse aggregate shall be size #57 or #67 as graded within the limits given in ASTM C 33 unless otherwise specified.
- D. All aggregate shall be non-reactive according to ASTM C 1778.

2.18 COLOR ADDITIVE FOR EXTERIOR ELECTRICAL DUCT ENCASUREMENT

For exterior electrical duct concrete encasements, use a color additive for identification purposes: brick red "Colorfull," as manufactured by Owl Manufacturing Company, Arcadia, California; coral red "Chromix C-22," as manufactured by L. M. Scofield Company, Los Angeles, California; or District approved equal. Add the color additive while the concrete is being mixed using the quantity per cubic yard of concrete recommended by the manufacturer for the class of concrete indicated.

2.19 CONCRETE ADMIXTURES

- A. Concrete shall contain an air-entraining admixture. Admixture shall conform to ASTM C 260, except it shall be nontoxic after 30 days and shall contain no chlorides. Admixtures shall be Master Builders MB-AE 10, Sika AER (Sikamix 104), or District approved equal.
- B. Concrete shall contain a water-reducing admixture. The admixture shall conform to ASTM C 494, Type A or D, except it shall contain no chlorides, shall be nontoxic after 30 days, and shall be compatible with the air-entraining admixtures. The amount of admixture added to the concrete shall be in accordance with the manufacturer's recommendations. Admixtures shall be Master Builders Pozzolith polymer-type normal setting; Plastocrete (Sikamix 160) Normal Set, Sika Chemical Corporation; or District approved equal.
- C. Do not use any admixture that contains chlorides or other corrosive elements or more than 0.05% chloride ions in any concrete.

2.20 GROUT

- A. Nonshrink grout shall conform to the Corps of Engineers Specification for Nonshrink Grout, CRD-C621-83, and to these Standard Specifications. Use a nongas-liberating type, cement base, premixed product requiring only the addition of water for the required consistency. Grout shall be Hi-Flow Grout, Master Flow 713, or District approved equal. Components shall be inorganic.
- B. Ordinary type grout (dry pack) shall consist of one part portland cement to two parts sand (100% passing a No. 8 sieve). Add sufficient water to form a damp formable consistency.

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- C. Expansive Grout: Premixed, cementitious mixture with a minimum 28-day strength of 3,500 psi. Provide air-entraining content as recommended by the manufacturer.
- D. Epoxy Grout:
 - 1. Mix the two components of epoxy bonding compound in compliance with the manufacturer's instructions.
 - 2. Use sand that is oven dry and meets the following gradation requirements for epoxy grout:

Sieve Size:	No. 8	No. 50	No. 100
% Passing:	100	30 ±15	5 ±5

2.21 MORTAR

- A. Mortar or grout placed on horizontal construction joints shall be a mixture of cement, sand, and water in the same proportions used in the concrete but with coarse aggregate omitted.
- B. Mortar used for repair of concrete shall be made of the same materials as used for concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than one part cement to two and one-half parts sand by damp loose volume. The quantity of mixing water shall be no more than necessary for handling and placing.

2.22 BONDING COMPOUND

- A. Epoxy bonding compound shall be Concesive 1001 LPL, Adhesive Engineering Company, San Carlos, California; Sikadur Hi-Mod (Sikastix 370), Sika Chemical Corporation, Lyndhurst, New Jersey; Epoxtile 2391 by W. R. Grace and Company; Euco Epoxy 463 by Euclid Chemical Company; or District approved equal.
- B. Non-epoxy bonding compound shall be Weldcrete by Larsen Products Corp., Link by Sta-Dry Manufacturing Corp., Euco Weld by Euclid Chemical Co., or District approved equal. The compound shall be rewettable for up to two weeks.

2.23 CONCRETE MIX DESIGN

- A. All concrete to be transit mix only.
- B. Rapid set concrete to be non-corrosive and per OMWD's latest approved mix designs.
- C. Conform to ASTM C 94, except as modified by these Standard Specifications.
- D. Air content as determined by ASTM C 231 shall be 4% ±1%.
- E. Maximum water-cement ratio for Class A concrete = 0.45 by weight.
- F. Use classes of concrete as described in the following table:

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Class	Type of Work	28-Day Compressive Strength (in psi)	Minimum Cement Content (in lbs per C.Y.)
A	Concrete for all structures and concrete not otherwise specified. Concrete fill at structure foundations, cradle, supports across pipe trenches.	4,000	564
B	Pavement.	3,000	500
C	Floor grout, miscellaneous unreinforced concrete.	2,000	376

G. Measure slump in accordance with ASTM C 143. Slump shall be as follows:

Slab on grade or heavy sections wider (in plan view) than 3 feet	3 inches max.
Footings, walls, suspended slabs, beams, and columns	4 inches max.
Pavement	2 inches max.
Floor grout, miscellaneous unreinforced concrete	4 inches max.

Proportion and produce the concrete to have a maximum slump as shown. A tolerance of up to 1-inch above the indicated maximum shall be allowed for individual batches provided the average for all batches or the most recent 10 batches tested, whichever is fewer, does not exceed the maximum limit. Concrete of lower than usual slump may be used provided it is properly placed and consolidated.

H. Aggregate size shall be 3/4-inch maximum for slabs and sections 8 inches thick and less. Aggregate size shall be 1-inch maximum for slabs and sections greater than 8 inches and smaller than 17 inches. Aggregate size shall be 1-1/2 inches maximum for all larger slabs and sections. Aggregate size for floor grout shall be maximum 3/8-inch.

I. Combined aggregate grading shall be as shown in the following table:

	Maximum Aggregate Size			
	1-1/2-inch	1-inch	3/4-inch	3/8-inch
Aggregate Grade per ASTM C 33	467	57	67	8

J. Mix design for pumped concrete shall produce a plastic and workable mix. The percentage of sand in the mix shall be based on the void content of the coarse aggregate.

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2.24 CONCRETE TESTS

- A. The District will require the Contractor to test for concrete quality as described below.
1. Frequency of Sampling: Cast four concrete test cylinders from each 50 cubic yards, or fraction thereof, of each class of concrete placed in any one day. Sampling and curing of cylinders shall conform to ASTM C 31.
 2. Strength Testing: Test cylinders in accordance with ASTM C 39. Test one cylinder at 7 days for information; test two cylinders at 28 days for acceptance; and hold one cylinder for verification. Strength acceptance will be based on the average of the strengths of the two cylinders tested at 28 days. If one cylinder of a 28-day test manifests evidence of improper sampling, molding, or testing, other than low strength, discard it and use the fourth cylinder for the test result.
 3. Determine concrete slump by ASTM C 143 with each strength test sampling and as required to establish consistency.
 4. Determine air content of the concrete using ASTM C 231 to verify the percentage of air in the concrete immediately prior to depositing in forms.
 5. The average value of concrete strength tests shall be equal to or greater than the specified 28-day strength. No test shall be less than 90% of the specified 28-day strength.
 6. If the 28-day strength tests fail to meet the specified minimum compressive strength, the concrete will be assumed to be defective and one set of three cores from each area may be taken as selected by the District's Representative and in accordance with ASTM C 42. If the average compressive strength of the set of three concrete cores fails to equal 90% of the specified minimum compressive strength or if any single core is less than 75% of the minimum compressive strength, the concrete will be considered defective. The District may require additional coring, nondestructive load testing, or repair of defective concrete. Costs of coring, testing of cores, load testing, and required repairing pertaining thereto shall be paid by the Contractor at no extra cost to the District.
- B. To facilitate concrete sampling and testing, the Contractor shall:
1. Furnish labor, equipment, and materials to assist the District's Representative in obtaining and handling samples at the project site.
 2. Advise the District's Representative in advance of concrete placing operations to allow for scheduling and completion of quality testing.
 3. Provide and maintain facilities for safe storage and proper curing of concrete test specimens on the project site, as required by ASTM C 31.

2.25 CURING COMPOUND

- A. Curing compound shall conform to ASTM C 309.

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- B. Curing compound shall be compatible with required finishes and coatings and shall meet the State of California Clean Air Quality Standards which limit the quantity of volatile organic compounds to 250 grams per liter.

2.26 CLEAR FLOOR HARDENER (SURFACE APPLIED)

Floor hardener shall be a colorless, aqueous solution of zinc and/or magnesium fluosilicate. Each gallon of the fluosilicate solution shall contain not less than 2 pounds of crystals. Hardener shall be Saniseal, a product of Master Builders Company, Cleveland, Ohio; Hornolith, a product of Grace Construction Materials, Cambridge, Massachusetts; Lapidolith, a product of Sonneborn, Minneapolis, Minnesota; or District approved equal. The solution shall be delivered ready for use in the manufacturer's original sealed containers.

2.27 MATS, PAPER, AND SHEETING FOR CURING

- A. Burlap mats shall conform to AASHTO Specification M182.
- B. Sisal-kraft paper and polyethylene sheets shall conform to ASTM C 171.

PART 3 - EXECUTION

3.01 FORM TOLERANCES

- A. Failure of the forms to produce the specified concrete surface and surface tolerance shall be grounds for rejection of the concrete work. Rejected work shall be repaired or replaced at no additional cost to the District.
- B. The following table indicates tolerances or allowable variations from dimensions or positions of structural concrete work:

	Maximum Tolerance
Sleeves and inserts	+1/4" - 1/4"
Projected ends of anchors	+1/4" -0.0"
Anchor bolt setting	+1/4" -1/4"
Finished concrete, all locations	+1/4" -1/4" in 10 feet
	Max ±1" in total length

- C. The planes or axes from which the above tolerances are to be measured shall be as follows:

Sleeves and inserts: Centerline of sleeve or insert.

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- Projected ends of anchors: Plane perpendicular to the end of the anchor as located on the Drawings.
- Anchor bolt setting: Centerline of anchor bolt.
- Finish concrete: The concrete surface as located on the Drawings.

D. Where equipment is to be installed, comply with manufacturer’s tolerances if more restrictive than above.

3.02 FORM SURFACE PREPARATION

- A. Clean form surfaces to be in contact with concrete of foreign material prior to installation.
- B. Coat form surfaces in contact with concrete with a release agent prior to form installation.

3.03 FORM REUSE

Reuse only forms which provide a uniform surface texture on exposed concrete surfaces. Apply light sanding or other surface treatment between uses for uniform texture. Plug unused tie rod holes with corks, shave flush, and sand the concrete surface side. Do not patch forms other than filling tie rod holes, except in the case of Class II forms. Do not use metal patching discs on Class I forms.

3.04 REMOVAL OF FORMS

A. Forms and shoring for elevated structural slabs or beams shall remain in place until the concrete has reached a compressive strength equal to the specified 28-day compressive strength as determined by test cylinders. Do not remove supports and reshore. The following table indicates the minimum allowable time after the last cast concrete is placed before forms, shoring, or wall bracing may be removed:

Sides of footings and encasements	24 hours
Walls, vertical sides of beams, girders, columns, and similar members not supporting loads	48 hours
Slabs, beams, and girders	10 days (forms only)
Shoring for slabs, beams, and girders	Until concrete strength reaches specified 28-day strength
Wall bracing	Until top or roof slab concrete reaches specified 28-day strength

B. Do not remove forms from concrete which has been placed with outside air temperature below 50°F without first determining if the concrete has properly set without regard for time. Do not apply heavy loading on green concrete. Immediately after forms are removed, the

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surface of the concrete shall be carefully examined and any irregularities in the surface shall be repaired and finished as specified.

3.05 FORMED OPENINGS

Openings shall be of sufficient size to permit final alignment of pipes or other items without deflection or offsets of any kind. Allow space for packing where items pass through the wall to ensure watertightness. Provide openings with continuous keyways and waterstops. Provide a slight flare to facilitate grouting and the escape of entrained air during grouting. Provide formed openings with reinforcement as indicated in the typical structural details. Reinforcing shall be at least 2 inches clear from the opening surfaces and encased items.

3.06 EMBEDDED ITEMS

Set anchor bolts and other embedded items accurately and hold securely in position until the concrete is placed and set. Check all special castings, channels, or other metal parts that are to be embedded in the concrete prior to and again after concreting. Check all nailing blocks, plugs, and strips necessary for the attachment of trim, finish, and similar work prior to concreting.

3.07 PIPES AND WALL SPOOLS CAST IN CONCRETE

- A. Install pipes, wall spools, and wall anchors before placing concrete. Do not weld, tie or otherwise connect the pipes, spools or anchors to the reinforcing steel.
- B. Support pipe and fabricated fittings, to be encased in concrete, on concrete piers or pedestals.

3.08 BEVELED EDGES (CHAMFER)

Form 3/4-inch beveled edges on exposed concrete edges and corners, beam soffit corners, and where indicated on the Drawings. Reentrant corners in concrete members shall not have fillets, unless otherwise shown in the Drawings. The top edges of slabs, walkways, beams, and walls may be beveled with an edging trowel in lieu of using chamfer strips.

3.09 CONSTRUCTION JOINTS

- A. Layout of construction joints shall be as shown in the Drawings and according to the following guidelines:
 - 1. Provide horizontal construction joints at top of foundation members and slabs-on-grade and at the soffit of supported slabs and beams.
 - 2. Space the construction joints at a maximum horizontal distance of 25 feet and a maximum vertical distance of 16 feet.
 - 3. Space the corner vertical construction joints between 4 and 8 feet from the corner of walls or wall intersections.
 - 4. Space horizontal construction joints at least 8 inches below bottom of slabs.

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- B. For slabs-on-grade that are not subject to hydraulic loading, use formed construction joints. Maximum size of pour shall be 30 feet each way for slabs with wire mesh reinforcement and 75 feet each way for slabs with bar reinforcement. Allow 24 hours between pours of adjacent slabs. Provide joints as specified or shown. Set continuous expansion joint strips between slabs and abutting vertical surfaces as indicated in the Drawings.
- C. Place expansion joint fillers every 30 feet in straight runs of walks, at right-angle turns, and wherever concrete walks butt into vertical surfaces.
- D. For control joints of nonstructural slabs, provide partial depth plastic strips set flush with finished surface or 1/8-inch-wide joints cut with a diamond saw. Use control joints one-quarter to one-third the depth of the slab unless otherwise indicated.
- E. Construction joints shall be keyed, unless otherwise detailed. Form keyways by beveled strips or boards placed at right angles to the direction of shear. Except where otherwise shown on the Drawings or specified, keyways shall be at least 1-1/2 inches in depth over at least 25% of the area of the section.
- F. When it is necessary to make a joint because of an emergency, furnish and place reinforcing dowels across the joint. Embed dowels 48 bar diameters each side of the joint. Size and number of dowels shall match reinforcing in the member. Furnishing and placing such reinforcing steel shall be at the Contractor's expense.
- G. After the pour has been completed to the construction joint and the concrete has hardened, thoroughly clean the entire surface of the joint of surface laitance, loose or defective concrete, and foreign material, and expose clean aggregate by sandblasting the surface of construction joints before placing the new concrete. Cover horizontal construction joints with mortar. Spread uniformly and work thoroughly into all irregularities of the surface. The water-cement ratio of the mortar in place shall not exceed that of the concrete to be placed, and the consistency of the mortar shall be suitable for placing and working.
- H. In case of emergency, place additional construction joints. (An interval of 45 minutes constitutes cause for an emergency construction joint.)

3.10 EXPANSION JOINTS

Provide expansion joints with continuous edge reservoirs, which shall be filled with a joint sealant. Leave the material used for forming the reservoirs in place until immediately before the grooves are cleaned and filled with joint sealant. After removing edge forms from the reservoir, remove grout, loose concrete, and fins; then sandblast the slots. Allow the reservoirs to become thoroughly dry; then blow out the reservoirs and immediately prime and fill with the expansion joint sealant and backup materials. The primer used shall be supplied by the same manufacturer supplying the joint sealant.

3.11 TIME BETWEEN POURS

At least two hours shall elapse after depositing concrete in the columns or walls before depositing in beams, girders, or slabs supported thereon. Place beams, girders, brackets, column capitals, and haunches monolithically as part of the floor or roof system, unless otherwise indicated on the Drawings.

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3.12 INSTALLATION OF PREMOLDED JOINT FILLER

Install in joint accurately as shown. Attach to concrete with a bonding agent recommended by the joint sealant and joint filler manufacturer for compatibility.

3.13 INSTALLATION OF JOINT SEALANTS

- A. Immediately before installing the joint sealant, clean the joint cavity by sandblasting or power wire brushing. Install bond breaker tape per manufacturer's instructions.
- B. After the joints have been prepared as described above, apply the joint sealant. Apply the primer, if required, and joint sealant only with the equipment and methods recommended by the joint sealant manufacturer. Application criteria for the sealant materials, such as temperature and moisture requirements and primer cure time, shall be in accordance with the recommendations of the sealant manufacturer.
- C. Apply masking tape along the edges of the exposed surface of the exposed joints. Trowel the joints smooth with a tuck pointing tool wiped with a solvent recommended by the sealant manufacturer.
- D. After the sealant has been applied, remove the masking tape and any sealant spillage.

3.14 INSTALLATION OF STEEL EXPANSION JOINT DOWELS

Install parallel to wall or slab face, perpendicular to the joint face, and in true horizontal position. Secure tightly in forms with rigid ties. Orient dowels to permit joint movement.

3.15 PLACING REINFORCEMENT

- A. Place reinforcing steel in accordance with the current edition of Recommended Practice for Placing Reinforcing Bars, published by the Concrete Reinforcing Steel Institute.
- B. Place reinforcing in accordance with the following, unless otherwise indicated:
 - 1. Reinforcement indicated on the drawings is continuous through the structure to the farthest extent possible. Terminate bars 2 inches clear from faces of concrete.
 - 2. Splices may be used to provide continuity due to bar length limitations. Minimum length of bars spliced for this reason is 40 feet. Splicing of reinforcement which is detailed to be continuous on the Drawings is not permitted.
- C. Reinforcing steel, before being positioned and just prior to placing concrete, shall be free from loose mill and rust scale and from any coatings that may destroy or reduce the bond. Clean reinforcing steel by sandblasting or wire brushing and remove mortar, oil, or dirt to remove materials that may reduce the bond.
- D. Do not straighten or rebend reinforcing steel in the field. Do not use reinforcing with bends not shown in the Drawings.
- E. Position reinforcing steel in accordance with the Drawings and secure by using annealed wire ties or clips at intersections and support by concrete or metal supports, spacers, or metal

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hangers. Do not place metal clips or supports in contact with the forms. Bend tie wires away from the forms to provide the specified concrete coverage. Bars additional to those shown on the Drawings, which may be found necessary or desirable by the Contractor for the purpose of securing reinforcement in position, shall be provided by the Contractor at his own expense.

- F. Place reinforcement a minimum of 2 inches clear of any metal pipe or fittings.
- G. Secure reinforcing dowels in place prior to placing concrete. Do not press dowels into the concrete after the concrete has been placed.
- H. Roll welded wire fabric used for reinforcement flat before placing concrete. Extend fabric to within two inches of the slab edges and lap splices at least 1-1/2 courses of the fabric and a minimum of 6 inches. Tie laps and splices at ends and at 24 inches on center. Pull the fabric into position as the concrete is placed by means of hooks, and work concrete under the fabric to ensure that it is placed at the proper distance above the bottom of the slab.
- I. Position dowels for masonry walls to occur at reinforced block cells.

3.16 SITE-MIXED CONCRETE

Conform to ACI 304.

3.17 READY-MIXED CONCRETE

Conform to ASTM C 94.

3.18 PLACING CONCRETE

- A. Conform to ACI 304.
- B. The subgrade for slabs on ground shall be well drained and of adequate and uniform loadbearing nature. The in-place density of the subgrade soils shall be at least the minimum required by the specifications. No foundation, slab, or pavement concrete shall be placed until the depth and character of the foundation soils have been inspected and approved by the materials testing consultant.
- C. The subgrade shall be moist at the time of concreting. If necessary, the subgrade shall be dampened with water in advance of concreting, but no free water shall remain standing on the subgrade nor any muddy or soft spots when the concrete is placed.
- D. Place ready-mixed concrete within the specified delivery time after initial batching based on the outside temperature. Ready-mixed concrete exceeding the delivery time will be rejected by the District's Representative.

<u>Outside Temperature</u>	<u>Delivery Time</u>
Below 40 degrees F (4 degree C)	See Cold Weather Placing
40 to 85 degrees F (4 to 29 degrees C)	90 Minutes
86 to 90 degrees F (30 to 32 degrees C)	75 Minutes
Above 90 degree F (32 degree C)	60 Minutes

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3.19 PUMPING CONCRETE

Conform to ACI 304.2R-71.

3.20 WEATHER REQUIREMENTS

- A. Conform to ACI 305 for placing during hot weather.
- B. Conform to ACI 306 for placing during cold weather.
- C. Do not place ready-mixed concrete in the rain or at times when rain is expected or forecasted. The District's Representative in his sole judgement may reject any concrete work that is affected by rain.

3.21 BONDING TO OLD CONCRETE

Coat the contact surfaces with epoxy bonding compound. The method of preparation and application of the bonding compound shall conform to the manufacturer's printed instructions and recommendations for specific application for this project.

3.22 BACKFILL AGAINST WALLS

Do not place backfill against walls until the concrete has obtained a compressive strength equal to the specified 28-day compressive strength. Where backfill is to be placed on both sides of the wall, place the backfill uniformly on both sides.

Do not backfill the walls of structures that are laterally restrained or supported by suspended slabs or slabs on grade until the slab is poured and the concrete has reached the specified compressive strength.

3.23 CONCRETE FINISHES

Complete concrete surfaces in accordance with the following schedule:

<u>Finish Designation</u>	<u>Area Applied</u>
F-1	Beams, columns, and exterior walls not exposed to view.
F-3	Beams, columns, and walls of structures or buildings exposed to view. Underside of formed floors or slabs.
F-4	Exterior and interior surfaces to be coated.
S-1	Slabs and floors to be covered with concrete or grout.
S-4	Slabs and floors of structures or buildings exposed to view.

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S-5	Slabs and floors at slopes greater than 10% and stairs.
E-1	Exposed edges. EXCEPTION: edges normally covered with earth.
E-2	Top of walls, beams, and similar unformed surfaces.

- A. Finish F-1: Repair defective concrete, fill Depressions deeper than 1/2-inch, and fill tie holes.
- B. Finish F-3: In addition to Finish F-1, remove fins, fill depressions 1/4-inch or deeper, fill depressions and airholes with mortar. Dampen surfaces and then spread a slurry consisting of one part cement and one and one-half parts sand by damp loose volume, over the surface with clean burlap pads or sponge rubber floats. Remove any surplus by scraping and then rubbing with clean burlap.
- C. Finish F-4: Repair defective concrete, remove fins, fill depressions 1/16-inch or deeper, fill tie holes, remove mortar spatter, and remove bulges higher than 1/16-inch.
- D. Finish S-1: Screed to grade without special finish.
- E. Finish S-4: Steel trowel finish without local depressions or high points and apply a light hair-broom finish. Do not use stiff bristle brooms or brushes. Leave hair-broom lines parallel to the direction of slab drainage.
- F. Finish S-5: Steel trowel finish without local depressions or high points. Apply a stiff bristle broom finish. Leave broom lines parallel to the direction of slope drainage.
- G. Finish E-1: Provide chamfer or beveled edges.
- H. Finish E-2: Strike smooth and float to an F-3 or F-4 finish.

3.24 CURING CONCRETE

- A. Conform to ACI 308.
- B. Water cure with burlap mats unless optional curing methods are permitted.
- C. Do not use curing compound on surfaces which are to be coated with clear floor hardener.
- D. It is the responsibility of the Contractor to select the appropriate curing method in response to climatical and/or site conditions occurring at the time of concrete placement. Take appropriate measures as described in ACI 305 and 306 for protecting and curing concrete during hot and cold weather.

3.25 REPAIR OF DEFECTS

- A. Do not repair defects until concrete has been reviewed by the District's Representative.

SECTION 03000 – GENERAL CONCRETE CONSTRUCTION

- B. Surface Defects: Repair surface defects that are smaller than 1-foot across in any direction and are less than 1/2-inch in depth.

Repair by removing the honeycombed and other defective concrete down to sound concrete, make the edges perpendicular to the surface and at least 3/8-inch deep, thoroughly dampen the surface, work into the surface a bonding grout (one part cement to one part fine sand), fill the hole with mortar, match the finish on the adjacent concrete, and cure as specified.

- C. Severe Defects: Repair severe defects that are larger than surface defects but do not appear to affect the structural integrity of the structure.

Repair by removing the honeycombed and other defective concrete down to sound concrete, make the edges of the hole perpendicular to the surface, sandblast the surface, coat the sandblasted surface with epoxy bonding compound, place nonshrink grout, match the finish on the adjacent concrete, and cure as specified.

- D. Major Defects: If the defects are serious or affect the structural integrity of the structure or if patching does not satisfactorily restore the quality and appearance to the surface, the District may require the concrete to be removed and replaced, complete, in accordance with the provisions of this section.

3.26 REPAIR OF CRACKS

- A. Repair cracks in concrete structures that are wider than 1/10-inch in width by cutting out a square edged and uniformly aligned joint 3/8-inch wide by 3/4-inch deep, preparing exposed surfaces of the joint, priming the joint, and applying polyurethane joint sealant.
- B. If the cracks are serious or affect the structural integrity or function of the element, the District's Representative may require the concrete to be removed and replaced, complete, in accordance with the provisions of this section.

3.27 CLEAR HARDENER APPLICATION (SURFACE APPLIED)

- A. Cure, clean, and keep floors dry to receive hardener. Complete work immediately above floors prior to applying hardener. Apply hardener evenly, using three coats, allowing 24 hours between coats. The first coat shall be one-third strength, second coat one-half strength, and third coat two-thirds strength. Apply each coat so as to remain wet on the concrete surface for 15 minutes. Apply proprietary hardeners in conformance with the manufacturer's instructions. After the final coat is completed and dry, remove surplus hardener from the surface by scrubbing and mopping with water.
- B. Apply hardener to the surfaces designated in the Drawings.
- C. Apply hardener to risers and treads of concrete stairs as described above.

3.28 ALUMINUM SURFACES IN CONTACT WITH CONCRETE

Coat aluminum surfaces in contact with concrete per Standard Specification Section 09900, System No. 51.

SECTION 03000 – GENERAL CONCRETE CONSTRUCTION

END OF SECTION

SECTION 05121 – MISCELLANEOUS METALWORK

STANDARD SPECIFICATION SECTION 05121 MISCELLANEOUS METALWORK

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, fabrication, and installation of structural steel, connecting bolts, pipes, galvanizing, welding electrodes, guard posts, ladders, covers and frames, vents, air valve enclosures, supports, eyebolts, anchors, and other miscellaneous metalwork.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Painting and Coating: STD SPEC 09900.

1.03 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Submit drawings of fabricated items, such as, but not limited to, pipe supports, vents, and air valve enclosures. Show dimensions and reference materials of construction by ASTM designation and grade.
- C. Submit manufacturer's catalog data and dimensional drawings for lifting eyebolts and inserts; ladders with safety post; manhole covers and frames; and anchor bolts.
- D. Submit detailed shop drawings and calculations, signed and sealed by a Professional Civil or Structural Engineer currently registered in the State of California. Construction of concrete foundation pad shall not commence prior to approval of anchor design.
- E. Submit a current Evaluation Report for all anchors that will be considered for use on this project. A current Evaluation Report from an independent testing and evaluation agency (ITEA) shall be submitted for all anchors that will be used on this project. The ITEA producing the evaluation report shall be accredited in accordance with the requirements for ITEA's in ACI 355.2 (for mechanical anchors) or 355.4 (for adhesive anchors). Acceptable ITEA's include but are not necessarily limited to the International Code Council Evaluation Service (ICC-ES) and the International Association of Plumbing and Mechanical Officials Uniform Evaluation Service (IAPMO-UES).
- F. Submit manufacturer's installation instructions and literature for all anchors that will be used on this project.

SECTION 05121 – MISCELLANEOUS METALWORK

PART 2 - MATERIALS

2.01 STRUCTURAL STEEL

Material for bolted or welded construction shall conform to ASTM A 36, unless noted otherwise.

2.02 BOLTS

Steel anchor and connection bolts shall conform to ASTM A 307, unless noted otherwise. Provide galvanized bolts. Provide with galvanized self-locking nuts or lockwashers and plain nuts.

2.03 STEEL PIPE

Pipe for guard posts and vault vents shall be standard weight (Schedule 40) conforming to ASTM A 53 or A 120, and hot dipped galvanized.

2.04 GALVANIZING

Zinc coating for plates, bolts, anchor bolts, and threaded parts shall be in accordance with ASTM A 153. Structural steel shall be zinc coated in accordance with ASTM A 123.

2.05 WELDING ELECTRODES

Welding electrodes for structural steel shall conform to AWS A5.5. Use electrodes in the E-70 series.

2.06 GUARD POSTS

Use standard weight (Schedule 40) steel pipe, hot dipped galvanized, and 6 feet long. Coat aboveground surfaces per Standard Specification Section 09900, System No. 20. Finish color to be OSHA Yellow. Guard post will be filled with concrete with a dome top finish.

2.07 COVERS AND FRAMES

Vault covers and frames shall be cast iron and designed for traffic loading. Castings shall be smooth, clean and free from blisters, blowholes, and shrinkage. Covers shall seat firmly into the frames without rocking. Frames shall be provided with anchor bolts and neoprene gasket. Covers shall be provided with stainless steel cap screws and lifting holes. Dip castings in a preparation of asphalt or coal tar and oil to form a firm and tenacious coating. Covers and frames shall be Alhambra Foundry Company No. A-1106, or District approved equal.

2.08 VAULT VENTS

- A. Fabricate vault vents as shown on the Drawings. Vault vents shall be of welded steel construction and hot dipped galvanized after fabrication. Coat vault vents per Standard Specification Section 09900, System No. 20. Finish color to be OSHA Blue.
- B. Use standard weight (Schedule 40) steel pipe with one threaded end for the riser section. At the plain pipe end, cut three 5-inch long by 3-inch high window openings evenly spaced along

SECTION 05121 – MISCELLANEOUS METALWORK

the circumference of the pipe. Locate top of window 1-inch from end of pipe. Place 10 x 10 steel wire cloth over the window openings on the inside surface of the pipe and tack weld.

- C. Use 10-gauge steel pipe for the hood. Center a circular cut 1/4-inch thick plate on the plain pipe end of the riser section. Attach the plate to the riser with a full circle fillet weld.

2.09 ADHESIVE ANCHORS

- A. Adhesive anchors shall be a two component system consisting of an all threaded anchor rod with nut and washer, and the adhesive capsule. All buried fasteners, underwater fasteners, fasteners in confined areas containing fluid, and fasteners in corrosive environments shall be Type 316 stainless steel conforming to ASTM F 593 with nuts conforming to ASTM F 594. Anchor rods for aluminum and stainless steel members not subject to the above conditions shall be Type 304 stainless steel conforming to ASTM F 593 with nuts conforming to ASTM F 594. Adhesive anchors shall be Hilti HIT-HY 200 V3 Adhesive Anchoring System, SET-3G Epoxy Adhesive Anchors by Simpson Strong-Tie Co. or equal.

2.10 WEDGE ANCHOR BOLTS

- A. Wedge anchor bolts shall not be used to anchor Pressure Reducing Station (PRS) to concrete foundation.
- B. Anchor bolts for use in concrete shall be a stud type expansion anchor with a single piece wedge that performs as three independent wedges. Stud and wedge shall be Type 304 stainless steel conforming to ASTM A 276. Nut shall be Type 304 stainless steel conforming to ASTM F 594 with washer of similar material. Wedge anchor bolts shall be Hilti Kwik Bolt II, or District approved equal.

PART 3 - EXECUTION

3.01 STORAGE OF MATERIALS

Store structural material, either plain or fabricated, above ground on platforms, skids, or other supports. Keep material free from dirt, grease, and other foreign matter and protect from corrosion.

3.02 FABRICATION AND ERECTION

- A. Fabricate miscellaneous metal items to straight lines and true curves. Drilling and punching shall not leave burrs or deformations. Continuously weld permanent connections along the entire area of contact. Exposed work shall have a smooth finish with welds ground smooth. Joints shall have a close fit with corner joints coped or mitered and shall be in true alignment. Unless specifically indicated on the Drawings, there shall be no bends, twists, or open joints in any finished member nor any projecting edges or corners at intersections. Conceal fastenings wherever possible. Built-up parts shall be free of warp. Exposed ends and edges of metal shall be slightly rounded. All boltholes shall be 1/16-inch in diameter larger than bolt size.
- B. Clean the surfaces of metalwork to be in contact with concrete of rust, dirt, grease, and other foreign substances before placing concrete.

SECTION 05121 – MISCELLANEOUS METALWORK

- C. Set embedded metalwork accurately in position when concrete is placed and support it rigidly to prevent displacement or undue vibration during or after the placement of concrete.
- D. Repair or replace metal items with damaged galvanized surfaces. Accomplish repairs with a field applied, cold galvanizing repair compound. Apply in accordance with the manufacturer's instructions.

3.03 WELDING

- A. Contractor shall submit welding procedure along with welder certifications for approval by the District Representative. Welder certifications must be current within the last year.

3.04 BOLTING

- A. Use steel bolts to connect structural steel members.
- B. Drive bolts accurately into the holes without damaging the thread. Protect boltheads from damage during driving. Boltheads and nuts shall rest squarely against the metal. Where self-locking nuts are not furnished, bolt threads shall be upset to prevent the nuts from backing off.
- C. Bolts shall be of the length that will extend entirely through but not more than 1/4-inch beyond the nuts. Draw boltheads and nuts tight against the work. Tap boltheads with a hammer while the nut is being tightened. After final tightening, lock the nuts.

3.05 ADHESIVE ANCHORS

- A. Post-installed concrete anchors shall be inspected as required by ACI 318.
- B. All adhesive anchor installations in the horizontal to vertically overhead orientation shall be conducted by a certified Adhesive Anchor Installer as certified by ACI/CSRI per ACI 318-19 26.7. Current AAI Certificate must be submitted to the Engineer of Record prior to commencement of any adhesive anchor installations.
- C. All concrete anchors shall be installed in strict conformance with the manufacturer's printed installation instructions. A representative of the manufacturer shall be on site when required by the Engineer.
- D. All holes shall be drilled in accordance with the manufacturer's instructions except that cored holes shall not be allowed unless specifically approved by the Engineer. If cored holes are allowed, cored holes shall be roughened in accordance with manufacturer requirements. Thoroughly clean drill holes of all debris, drill dust, and water in accordance with the manufacturer's instructions prior to installation of adhesive and threaded rod unless otherwise recommended by the manufacturer. Degree of hole dampness shall be in strict accordance with manufacturer recommendations. Installation conditions shall be either dry or water saturated. Water filled or submerged holes shall not be permitted unless specifically approved by the Engineer. Injection of adhesive into the hole shall be performed to minimize the formation of air pockets in accordance with the manufacturer's instructions. Wipe rod free from oil that may be present from shipping or handling.

SECTION 05121 – MISCELLANEOUS METALWORK

END OF SECTION

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SECTION 15061 – STEEL TRANSMISSION PIPE

STANDARD SPECIFICATION SECTION 15061 STEEL TRANSMISSION PIPE

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, design, fabrication, and testing of cement mortar lined and di-electric coated and/or cement-mortar coated welded steel pipe with special pieces in accordance with AWWA C200, C205, C208 and the following options and restrictions. Size range is 6- to 36-inch nominal pipe size.

1.02 SPECIALS

A special is defined as any piece of pipe other than a normal full length of straight pipe. This includes but is not limited to elbows, manhole sections, short pieces, reducers, adapter sections with special ends, sections with outlets, etcetera.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Painting and Coating: STD SPEC 09900.
- D. Polyethylene Tape Pipe Coating: STD SPEC 09957.
- E. Corrosion Control for Buried Piping: STD SPEC 15310.
- F. General Piping Requirements: STD SPEC 15050.
- G. Flexible Pipe Couplings: STD SPEC 15122.
- H. Pressure Testing of Piping: STD SPEC 15144.
- I. Installation of Steel Transmission Pipe: STD SPEC 15251.

1.04 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Submit an affidavit of compliance with AWWA C200 and C205.
- C. Submit detailed shop drawings for the pipe and specials showing:
 - 1. Order of installation and closures with designation by piece number for each steel pipe and fabricated special to be furnished and installed.
 - 2. Pipe station and centerline elevation at each change of grade and horizontal alignment.

SECTION 15061 – STEEL TRANSMISSION PIPE

3. Elements of curves and bends, both in horizontal and vertical alignment including elements of the resultant true angular deflections in case of combined curvature.
4. Pipe outside diameter, wall thickness, location of welded seams, and working pressure rating.
5. Locations of bulkheads for field hydrostatic testing of pipeline.
6. Locations of closures for length adjustment and for construction convenience.
7. Locations of valves, manholes, and other mechanical equipment.
8. Limits of each reach of field-welded joints, rubber gasket joints, and of concrete encasement.
9. Call out weld sizes and dimensions of thrust ring collars, grooved end collars, flanges, reinforcing collars, wrapper plates, and crotch plates.
 - D. Submit joint details.
 - E. Submit details of lining and coating.
 - F. Submit drawings of butt straps, couplings, and flanges.
 - G. Submit details of bulkheads and of their method of attachment to the pipeline.
 - H. Submit certificate that cement complies with ASTM C 150, designating type.
 - I. Submit certified copies of mill test reports on each heat from which steel is rolled.
 - J. Submit test reports on physical properties of rubber used in gaskets.
 - K. Submit welding procedure specifications (WPS) and procedure qualification records (PQR) for each welding process and welder qualification records (WQR) for each welder and welding operator.
 - L. Submit drawings of all pipes and specials to the District's Representative for review. The Contractor and Engineer of Work shall both review and mark the review action taken, before submitting to District. Shop drawings shall be complete in all respects. If the shop drawings show any deviations from the requirements of the Drawings and Standard Specifications because of standard shop practices or other reasons, the deviations and the reasons therefore shall be set forth in the submittal packages.
 - M. Submit fabricator's quality control program results in one complete binder including all inspection reports, conducted tests, certified mill test reports, weld test coupon reports, welder qualification records, hydrostatic testing reports, shop testing reports, final fabrication checklist for each special, and affidavit of compliance. The quality control program results shall document all phases of the fabrication process.

SECTION 15061 – STEEL TRANSMISSION PIPE

1.05 INSPECTION AND FIELD VERIFICATION

- A. The District's Representative or his authorized representative will inspect materials, fabrication, and testing of pipes and specials at the manufacturer's plant.
- B. Where new pipelines are to be connected to existing waterlines of the District, the Contractor shall verify in the field the location, elevation, pipe material, pipe outside diameter, and any other characteristics of the existing waterline before proceeding with the pipe fabrication or installation. This field verification shall be performed in the presence of the District's Representative. Adjust and align the new pipeline as necessary to meet the field conditions and provide all required material, labor, and equipment to make the connection.

PART 2 - MATERIALS

2.01 DESIGN CRITERIA

- A. Obtain the following information from the Drawings:
 - 1. Elevation of the pipe centerline and the completed ground.
 - 2. Alignment of the pipeline.
 - 3. Working pressure rating (psi) or pipe wall thickness. Working pressure is the maximum high water level (HWL) or maximum static head (HGL) of the pressure zone minus the pipe centerline elevation in feet divided by 2.31 feet per psi.
 - 4. Nominal pipe size.
 - 5. Location of single or double lap welded joints.
- B. Field hydrostatic test pressure shall be as indicated in Standard Specification Section 15144, unless noted otherwise on the Drawings.
- C. Steel Cylinder.
 - 1. The following formula shall be used to determine the stress in the steel cylinder:

$$S = \frac{PD}{2T}$$

- Where
- S = Stress, PSI
 - P = Working pressure rating, PSI
 - D = Actual outside diameter of steel cylinder, inches (not bell)
 - T = Wall thickness of steel cylinder, inches

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- 2. Stress in steel cylinders shall not exceed 50% of the yield strength, not to exceed 20,000 psi at the working pressure rating with no allowance for tensile strength of cement mortar, except minimum cylinder thicknesses shall be .1345 for all straight pipe and specials.
- 3. Steel cylinder outside diameters for pipe 12 inches and smaller in nominal pipe size shall conform to the following:

Nominal Pipe Size (inches)	Steel Cylinder Outside Diameter (inches)
6	6.625
8	8.625
10	10.750
12	12.750

2.02 SPECIALS

- A. Fabricated steel fittings shall comply with AWWA C208. For elbows, fabricate to a minimum centerline radius of 2.5 pipe diameters and provide the number of pieces as tabulated below:

Deflection Angle	Number of Pieces
0 to 22.5 degrees	2
22.6 to 45.0 degrees	3
45.1 to 67.5 degrees	4
67.6 to 90.0 degrees	5

- B. Use AWWA Manual M-11 (Current Edition) for determining the circumferential stress.
- C. Material for fabricated specials shall be the same as the pipe and may be from previously tested pipe manufactured in accordance with these specifications. Minimum wall thickness shall be equal to the thickest adjacent straight pipe, except that the following minimum wall thickness shall be 1345.
- D. Use AWWA Manual M11 (Current Edition) for determining outlet reinforcement.
- E. Steel pipe used for outlets, 12 inches and smaller, shall be standard weight conforming to ASTM A 53 (Type E or S), Grade B. For flanged outlets, use a slip on flange, double welded, and match the flange of the connecting component.
- F. At flanged outlets not indicated to be connected to valves or to other pipes, provide blind flanges with bolts, nuts, washers, and solid face gaskets.

2.03 STEEL FOR PIPE AND SPECIALS

Use steel conforming to ASTM A 36; ASTM A 283 Grade D; ASTM A 572 Grade 42; ASTM A 1011; or ASTM A 1018 Gr 36,40 or 45 with carbon content of 0.25% maximum. Use steel

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plate and sheet having a thickness with a maximum allowable variation of not more than 0.01-inch less than the minimum thickness specified.

2.04 CEMENT FOR INTERIOR MORTAR LINING

Use cement conforming to ASTM C 150, Type II.

2.05 CEMENT FOR EXTERIOR MORTAR COATING

Use cement conforming to ASTM C 150, Type II.

2.06 POLYETHYLENE TAPE PIPE COATING (DI-ELECTRIC COATED)

See Standard Specification Section 09957.

2.07 FLANGES

Use flanges conforming to AWWA C207, Class E or Class F; or ANSI B16.5, Class 150 or Class 300.

2.08 BOLTS, NUTS AND GASKETS FOR FLANGES

See Standard Specification Section 15050.

2.09 INSULATING FLANGE KITS

See Standard Specification Section 13110.

2.10 OUTLETS

For threaded outlets 3 inches and smaller, use a thredolet type per AWWA Manual M11 (Current Edition), Chapter 13. Outlets shall be 3000 pound WOG forged steel per ASTM A 105 or ASTM A 216, Grade WCB. Threads shall comply with ANSI B1.20.1, NPT. Outlets shall be per OMWD AML. Do not use pipe couplings for outlets.

2.11 MECHANICAL CLAMP-TYPE COUPLINGS

- A. Mechanical clamp-type couplings for grooved or shouldered end pipe shall be ductile iron, ASTM A 536 Grade 65-45-12. Bolts shall conform to ASTM A 183, 110,000 psi tensile strength. Gaskets shall be EPDM (ethylene propylene diene monomer) conforming to ASTM D 2000.
- B. Couplings for pipe, 12-3/4 inches outside diameter and smaller, shall conform to AWWA C606 for flexible, square cut grooved joints in IPS steel pipe with weld-on grooved adapters. Couplings shall be Victaulic Style 77 or District approved equal.
- C. Couplings for pipe, 15-3/8 inches outside diameter and larger, shall conform to AWWA C606 for shouldered end flexible joints with Type D special ends. Couplings shall be Victaulic Style 44 or District approved equal.

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2.12 TYPE OF PIPE JOINTS

Joint ends of pipe sections shall be welded. Rubber Gasket Joints are not allowed.

- A. Welded Joints: Use expanded bell with matching spigot to penetrate a minimum of 1-1/2 inches into the bell.
- B. Flanges: Use slip-on or ring type welded to the interior and exterior circumference of the pipe section. Use flanges for attaching pipe to valves, other appurtenances, or as shown on the Drawings.
- C. Butt Strap Closures: Butt straps shall be the same thickness and material as the pipe wall but not less than 10 gage, at least 10 inches wide, rolled to fit the outside cylinder diameter in two half sections, and shall be centered over the plain ends of the pipe sections they are to join. Weld a 5-inch threaded, steel, standard half coupling or couplings to the interior and exterior of the top butt strap half section to provide access for mortar lining the inside of the joint. Provide two couplings for pipes 18 inches and larger. Provide a threaded steel plug for each half coupling.
- D. Mechanical Clamp-Type Couplings: Use grooved or shouldered ends as determined by the outside diameter of the pipe and per AWWA C606. Prepare the pipe ends to properly engage with the specified dimensions of the coupling manufacturer for a correct fit.
- E. Flexible Pipe Couplings: Use plain end pipe and provide joint harnesses where shown. Flexible pipe couplings and harnesses shall conform to Standard Specification Section 15122.

2.13 PAINTING AND COATING APPLIED IN SHOP

- A. Wrap exterior surfaces of buried pipe with polyethylene tape pipe coating and apply cement mortar overcoat where shown on the Drawings as di-electric coated per Standard Specification Section 09957. Apply coating in shop.
- B. Cement mortar coat buried pipe where shown on the Drawings. Apply coating in shop.
- C. Coat the exposed bare steel surfaces of the spigot and bell ends of each pipe section per Standard Specification Section 09900, System No. 15 (prime coat only). Apply primer in shop to the interior and exterior surfaces to a 2-mil dry film thickness.
- D. Coat inside surfaces of threaded outlets and blind flanges per Standard Specification Section 09900, System No. 5. Apply coating in shop.
- E. Coat the grooved and shouldered ends of pipe to be in contact with mechanical clamp-type couplings per Standard Specification Section 09900, System No. 5. Apply coating in shop to the described surfaces to a maximum of 10 mils dry film thickness.

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- F. Coat the ends of plain end pipe where flexible pipe couplings are to be installed per Standard Specification Section 09900, System No. 5. Apply coating in shop.

PART 3 - EXECUTION

3.01 LENGTH OF PIPE SECTIONS

Provide pipe with a maximum length of 30 feet unless spreader beams are used in lifting the pipe sections at the third points, in which case lengths up to 40 feet can be used.

3.02 PIPE CYLINDER FABRICATION

- A. Longitudinal and Girth Welds: Fabricate the pipe cylinder by full penetration butt welding with spiral seam or straight seam. Limit girth welds to two per pipe section with full penetration butt welds. Limit longitudinal welds to one seam for pipe diameters less than 30 inches and two seams for 30- to 36-inch diameters. Stagger longitudinal seams of adjacent shell courses. When using spiral seam, coil splices shall be a minimum of 2 feet away from the ends of the pipe cylinder.
- B. Preparation on Edges: Machine or face the ends and edges of pipe sections for butt welds. Inspect sheared edges of plates or sheets over 1/4-inch in thickness for cracks. Do not use plates or sheets with edges containing cracks.
 - 1. If the ends are faced with a cutting torch, removed irregularities and scale due to burning by grinding or chipping.
 - 2. The dimensions and shape of the edges of the plates to be joined by welding and the gap between the plates shall be such as to allow thorough fusion and complete penetration, and the edges of plates shall be properly formed to accommodate the various welding conditions. Remove projecting burrs. Do not use hammering to shape the edges preparatory to welding.
 - 3. Cut plates true to line so that the edges, when in position for welding, shall be straight, parallel, and in contact on longitudinal seams.
 - 4. The maximum gap between the edges of plates prior to welding shall not be more than 1/16-inch.

C. Forming:

- 1. General:
 - a. Before rolling or forming longitudinal edges, plates shall be lap broken by a continuous rolling operation or be formed in a press having dies that are machined to the proper radius. The pressure exerted during the lap breaking operation shall be sufficient to secure a true and uniform curve at the edges of the plate. Roll or press form plates to the specified diameter.
 - b. Continually remove scale and other foreign matter accumulating on the plate during the rolling and forming operation by an air blast so that it will not be rolled or pressed

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into the surface of the plate. Keep the surfaces of breaker dies and rolls clear of bits of metal or other accumulated materials during forming operations.

- c. Form each section of pipe to a true circle of the specified diameter throughout its entire length so as to produce a finished pipe truly round and free from dents, kinks, and abrupt changes in curvature. The outside circumference of the finished pipe shall not be less than its design value and shall not exceed its design value by more than 0.4%.
 - d. Complete rolling and forming prior to making butt welds.
 - e. Do not heat or hammer for the necessary forming of angles.
2. Minimum Radius: Do not use any forming process in which the plates are bent or otherwise formed during any stage of the process to a curvature of appreciably smaller radius than the radius of curvature corresponding to the specified diameter of the pipe.
 3. Forming Bells:
 - a. Shape the bells to accommodate the spigot penetration. Form the bell on an expanding press or by being thrust axially over a die in such a manner as to stretch the steel plate beyond its elastic limit to a round bell of required diameter and shape, avoiding injurious reduction in plate thickness at any point, and avoiding impairment of the physical properties of any part of the plate.
 - b. Do not use any process in which the bell is formed by rolling.
 - c. Bells for mitered pipe shall be normal to the axis of the adjacent course of the adjoining pipe, and the axis of any such bell shall be parallel to the axis of such adjacent course.

D. Preparation for Welding:

1. Fit Up:
 - a. Take special care in the layout of joints in which fillet welds are to be used in order to ensure the fusion of the weld material at the bottom of the fillet. Prior to welding, fit the plates closely; and during welding, hold them firmly together.
 - b. Tack weld or clamp in place the edges of butt joints in proper alignment and hold throughout the welding process. Do not use dogs, clips, lugs, or equivalent devices welded to the steel plate for the purpose of forcing it into position.
2. Cleaning:
 - a. Prior to welding, clean the surfaces of plates and members to be welded by an automatic process of all scale and rust for a distance of not less than 1-inch and of all oil or grease for a distance of not less than 3 inches from the welding edge and on both sides of the plates in the case of butt joints.

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- b. Remove grease or oil with lye or other solvent. Do not use kerosene or any heavier petroleum solvent.
 - c. Blasting and other cleaning shall preferably be done prior to any tack welding of the plates. Should inspection indicate a greater amount of porosity at the tack welds than in the remainder of the welds, sandblast the tack welds prior to automatic welding.
 - d. When it is necessary to deposit metal over a previously welded surface, remove any scale, slag, or welding flux thereon by a roughing tool, chisel, air chipping hammer, or other means to prevent inclusion of impurities in the weld metal.
3. Aligning: Where butt-welded joints are used, take particular care in aligning the edges to be joined so that complete penetration and fusion at the bottom of the joint is accomplished. The offset in abutting edges shall not exceed 1/16-inch at circumferential and spiral seams and shall not exceed 1/32-inch at longitudinal seams.
- E. Fabrication of Specials: Fabricate specials from previously hydrostatically tested straight pipe sections.

3.03 WELDING

A. Material and Objective:

1. Perform welding by skilled welders who have had experience in the method and materials to be used. Welding operators shall be qualified under the standard qualification procedures of the ASME Boiler and Pressure Vessel Code, Section IX, Welding Qualifications. Any welder or welding operator performing work shall have been qualified for the process involved within the past three years.
2. Perform welding by an unvarying arc-welding process, which excludes the atmosphere during the process of deposition and while the metal is in a molten state. The size and type of electrode used, the current and voltage required, and the type of wire and flux to be used for automatic processes shall be subject to review by the District's Representative.
3. Do not use rusted or damaged electrodes. Sift used flux from automatic welders free of fines and coarse pieces and remove mill scale before reusing.
4. Welds shall be of uniform composition, neat, smooth, full strength, and ductile. Make welds with a technique which will ensure uniform distribution of load throughout the welded section with a minimum tendency to produce eccentric stress or distortion in the weld or in the adjacent metal.
5. Make all welds in such manner and on such time schedule as to avoid residual internal stresses in the welded joints and stresses due to temperature changes in the completed pipe sections. Weld longitudinal seams before girth seams.

B. Quality of Welds:

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1. There shall be no greater evidence of oxidation in the metal of the weld than in the metal of the unwelded plate. Welded joints shall be of a type that will produce complete fusion of the plates and shall be free from unsound metal, pinholes, and cracks.
2. The finish of welded joints shall be reasonably smooth and free from grooves, depressions, burrs, and other irregularities. There shall be no valley or undercut in the center or edges of any weld.
3. Any pipe section which shows irregularities in shape after welding may be rerolled to make it cylindrical, but in no case shall it be reformed by hammering, and in no event shall reforming be permitted of pipe sections which after welding are found to have abrupt changes in curvature at longitudinal seams, unless such welds are subsequently removed and rewelded following the reforming operation.
4. Back chipping on both automatic and hand welding, whether for repairs or preparation of the groove for the original weld, are subject to inspection by the District's Representative before being filled with weld metal. Do not make butt welds prior to the completion of the rolling and forming. Grind butt welds for both hand and automatic welding to sound metal before welding the reverse side.

C. Longitudinal Joints:

1. Longitudinal joints shall be double butt welded by a fully automatic welding process, using welding heads which permit visual investigation of the deepest point of penetration of the first pass and which permit backfilling of extensive repair cuts by the automatic process. Use starter and runoff plates for longitudinal weld. The first pass on longitudinal welds shall be on the inside of the pipe and shall accomplish at least 75 percent of the complete penetration.
2. Joint welds shall be continuous for the full length of the seam, and shall be built up uniformly at the center of the weld to form a reinforcement on both sides of the plate. The bead on the outside of the pipe shall have a height of at least 1/16-inch and no more than 3/32-inch and a minimum width of at least one and one-half times the thickness of the plate; provided that in any case the weld and penetration shall be of sufficient width so that both edges to be joined shall be entirely involved in the weld, regardless of a possible inaccuracy in the line of travel of the automatic electrode. Where the welding method permits a considerable deviation in the line of travel of the welding head, place a scribed line parallel to and at a fixed distance from the edges of the plates prior to welding so that the location of the welding bead with regard to the plate joints may be readily checked.
3. Where welding on small pipe is done from one side only, remove the bead on the inside of the pipe by chipping so that the finished weld on the inside of the pipe will be practically flush with the plates. The inside bead will in no case be required to be larger than the outside bead but shall be of sufficient size so that, upon its removal, the inside fusion lines and any defects near the under surface of the weld metal will be exposed.
4. If complete penetration and reinforcement on both sides of butt-welded joints are not satisfactorily accomplished, when the welding is done from one side, then chip out the reverse side to the extent necessary to secure a clean surface of the originally deposited weld metal and make an automatic welding pass on the reverse side. The bead on the

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inside of the pipe shall be not more than 1/16-inch in height and the width of the bead shall be not less than 3/8-inch with smoothly tapered edges. Before making the second weld, chip out the underside of the first weld with a round-nosed tool until entirely solid and clean metal is reached.

5. Welding shall be subject to the requirement that there shall be no valley, groove, or undercut along the edge of or in the center of the weld, and that the deposited metal shall be fused smoothly and uniformly into the plate surface at the edges of the joint.
6. If the normal welding process is interrupted for any reason, take special care when welding is resumed to get full penetration and thorough fusion between the weld metal and the plates and the weld metal previously deposited. Where welding is interrupted by faulty machine operation, chip back the weld to where the presence of solid, clean metal indicates correct machine operation before resuming welding operations.
 - D. Shop Circumferential Joints and Spiral Seam Joints: Shop circumferential and spiral seam joints shall be double butt welded. The details of shop circumferential and spiral seam joints shall conform to the requirements for longitudinal joints as given above. Circumferential joints in bends and welded fabricated fittings need not be made by automatic welding methods.
 - E. Defects: Completely chip out porosity and cracks, trapped welding flux, or other defects in the welds in a manner which will permit proper and complete repair by welding. Repair defective welds by hand welding. Where the defect is so extensive as to make a hand repair impractical, use automatic welds.
 - F. Equipment: In welding by an automatic process, both the rate of deposition of weld metal and the rate of travel of the electrode shall be automatically controlled. Use the submerged arc welding process for automatic welding.

3.04 SHOP TESTING

- A. General: After completion of fabrication and welding in the shop, and prior to the application of any lining or coating, test each component according to the following requirements.
- B. Shop Test Requirements:
 1. Perform tests of production welds in accordance with AWWA C200 for each heat of steel used. A guided-bend test specimen shall be considered as having passed only if no crack or other open defect exceeding 1/8-inch measured in any direction is present in the weld metal or heat affected zone of the base material after the bending. A tension test specimen shall be considered as having passed only if failure occurs in the base metal at a stress in excess of the minimum specified tensile strength. There shall be at least one set of welding tests as described in AWWA C200, Section 3.3.5 for each 1,000 linear feet of spiral seam weld in addition to tests specified in Section 3.3.6 of the same standard.
 2. Test each straight pipe section in the shop by the hydrostatic test method.

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3. Inspect all welds in the expanded portion of the pipe bell in accordance with the magnetic particle test.
4. Test backgouge and completed weld of all manual process groove welds by the liquid penetrant method. Test completed fillet welds by the liquid penetrant method.
5. Any production weld or manual process weld that appears to be of poor quality as determined by the District's Representative shall be subjected to 100 percent radiographic testing. One hundred percent ultrasonic testing may be used in lieu of 100 percent radiographic testing.
6. After shop fabrication, retest each pipe section with a mitered bend or reducer. Test the mitered or butt joints by 100 percent radiographic testing.
7. After shop fabrication, retest each pipe section with an attached outlet. Test the collar or wrapper with the soap and compressed air method. Test the outlet by the liquid penetrant method.
8. Test each slip-on or ring type flange welded to the pipe by the liquid penetrant method and with the soap and compressed air method.

C. Test Methods:

1. Shop Hydrostatic Test: Vent air from the pipe section before the test pressure is applied. Hold the test pressure on each section for a sufficient length of time to permit inspection of all joints.
2. Use the following hydrostatic test pressure for testing straight pipe sections:

$$P = \frac{2ST}{D}$$

Where P = Hydrostatic test pressure, PSI

S = Stress, PSI, use 75% of the minimum yield point of the steel

T = Wall thickness of the steel pipe section to be tested in inches

D = Actual outside diameter of the steel pipe section to be tested in inches

3. When subjected to the above hydrostatic test pressure, the pipe shall show no leaks, distortion, or other defects. Repair any leaks or other defects which develop during the hydrostatic test by chipping out and rewelding, after which the repaired section shall again be tested until it shows no leaks or other defects.
4. Test Bulkheads: Furnish and attach suitable dished heads and blind flanges for making the hydrostatic tests, and after completion of the tests, remove the heads and properly restore the ends of the sections.
5. Radiographic Test: Make the radiographs in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section VIII, Pressure Vessels. Repair defects in the welds disclosed by the radiographs. Submit all radiographs and the notation of areas for repair to the District's Representative for review.

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6. Ultrasonic Test: Make the ultrasonic tests in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section VIII, Pressure Vessels. Repair defects in the welds disclosed by ultrasonic testing. Prepare a report of the ultrasonic testing and submit to the District's Representative for review.
7. Soap and Compressed Air Test: Use compressed air at maximum 40-psi pressure into the joint, and while the joint is under pressure, swab every portion of every welded seam forming a part of the joint with a heavy soap solution or a commercial bubble-producing leak test fluid. Examine for leakage. Repair any defects disclosed by the test by chipping out, rewelding the chipped section, and retesting. Drill and tap the necessary test holes, and plug weld the holes after testing.
8. Liquid Penetrant Test: Conform to the requirements specified in ASTM E 165, Method B. The materials used shall be either water washable or nonflammable. Products: "Spotcheck" by the Magnaflux Corporation or "Met-L-Check Flaw-Findr" by the Met-L-Check Company. Chip out all defects, reweld, and retest the section affected until it shows no leaks or other defects.
9. Magnetic Particle Test: Magnetic particle test shall conform to the requirements specified in ASTM E 709, using the wet particle technique. Chip out all defects, reweld, and retest the section affected until it shows no leaks or other defects.

D. Pipe Fit Up at Flexible Pipe Couplings:

1. The following procedures shall be witnessed and accepted by the District's Representative in order to verify that the pipes are appropriately sized where the pipes are to be joined by a flexible coupling.
2. Obtain the specifications and fabrication tolerances for the specific flexible pipe coupling to be used. Deliver this information and the flexible pipe coupling to the pipe manufacturer. See Standard Specifications Section 15122. At each location where a flexible pipe coupling is to be installed, fabricate the pipe to a tolerance that will ensure proper fit of the flexible pipe coupling per the coupling manufacturer's requirements.
3. After fabrication of the pipe sections and application of the required coatings on the pipe, assemble the two pipe ends and the flexible coupling in the shop in the same alignment and configuration as the pipe will be assembled in the field. Check for ease of assembly and any evidence of an inadequate seal between the pipe and flexible pipe coupling.
4. If any evidence of inadequate seal is observed, repair the pipe in a manner acceptable to the District's Representative. Repeat the assembly and repair process until satisfactory results are achieved. If excessive repairs to the pipe are needed, the District's Representative may require, at his sole discretion, that a new section of pipe be fabricated.
5. Before disassembling the parts, mark the parts so that they can be re-assembled in the same orientation in the field.
6. Before any final acceptance by the District's Representative, test, and repair as necessary, any damages to the pipe coatings and linings caused by the fit-up procedure.

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3.05 ALIGNMENT CRITERIA

- A. For horizontal and vertical curve alignment, use straight or beveled pipe of normal or one-half normal lengths pulled partially open on one side of the joint or use pipes with a welded mitered bend of up to 10 degrees next to the bell end. Design pipes with a bend in excess of 10 degrees as a special. Do not use angular deflections at butt strap joints.
- B. Deflection by Pulled Joints:
1. For rubber gasket joints, do not pull joint more than one-half of the watertight extensibility provided by the bell and spigot design or more than 3/4-inch on the outside of the curve. Minimum interior joint space shall be 1/2-inch.
 2. For welded joints, do not pull joint to exceed the minimum overlap of the assembled bell and spigot lap joint or more than 1/2-inch on the outside of the curve. Minimum overlap of the assembled joint shall be 1-inch or 3 times the pipe wall thickness, whichever is greater per AWWA C206. Minimum interior joint space shall be 1/4-inch.
- C. Deflection By Beveled Joints: For welded joints only, use pipe sections having beveled bell ends for curves and angles in the alignment which cannot be accomplished using the maximum allowable deflection by pulled joints. Beveled pipe sections used in curved alignment shall be of standard length except when shorter sections are required to fit the radius of curvature in which case all sections shall be of equal length. Do not bevel spigot ends. The beveled end of a pipe shall not have a deflection from a plane perpendicular to the pipe axis exceeding 5 degrees. Form the bell end perpendicular to the plane of the beveled end, so there is no loss of lap joint tolerance. Do not pull beveled joints.
- D. Deflection By Mitered Bends: For rubber gasket joints and welded joints, use pipe sections with welded mitered bends of up to 10 degrees next to the bell end for curves and angles which cannot be accomplished using the maximum allowable deflections by pulled or beveled joints. Pipe sections with mitered bends used in curved alignment shall be of standard length except when shorter sections are required to fit the radius of curvature in which case all sections shall be of equal length.

3.06 THICKNESS OF INTERIOR MORTAR LINING

Conform to AWWA C205 except provide minimum thickness of mortar lining over steel cylinder and steel specials as follows:

<u>Nominal Pipe Size (inches)</u>	<u>Lining Thickness (inches)</u>
6 through 12	5/16
14 and 16	1/2
18 through 36	3/4

SECTION 15061 – STEEL TRANSMISSION PIPE

3.07 THICKNESS OF EXTERIOR MORTAR COATING OVER METALSURFACES

Conform to AWWA C205 except provide 1-1/4 inches minimum thickness of mortar coating over all metal surfaces, except at flanges. Coating within one bolt length of a flange shall be held to 50 percent of the above thickness.

3.08 PROTECTIVE COATING ON PIPE ENDS WITH MORTAR LINING AND COATING

Coat the exposed bare steel surfaces of the spigot and bell ends of each pipe section in the shop. Apply primer to the interior and exterior steel surfaces to a 2-mil dry film thickness.

3.09 POLYETHYLENE TAPE PIPE COATING WITH MORTAR ARMOR COAT

Where it is shown on the Drawings that polyethylene tape coating with mortar armor coat is to be used on the exterior of the pipe and specials, see Standard Specification Section 09957.

3.10 PRODUCT MARKING

Plainly mark each length of straight pipe and each special at the bell end to identify the proper location of the pipe item by reference to the layout schedule. For beveled joints and mitered bends at the bell end, show the degree of bevel or miter and the point on the circumference to be laid uppermost.

3.11 SHIPPING AND HANDLING

- A. When loading pipes and specials for shipment to the project site, use wooden stringers between pipe layers and secure the load with padded chains or ribbon binders. Place internal braces for pipes 24 inches in diameter and larger prior to loading.
- B. Lift pipes and specials for loading with wide nylon straps, wide canvas or padded slings, wide padded forks, and skids designed to prevent damage to the pipes and specials. Do not use cable slings or chains.
- C. Place plastic caps over the ends of the pipes and specials. Replace caps damaged during shipment to the project site.
- D. Do not drop, roll, or damage the pipes and specials.

3.12 INSTALLATION

See Standard Specification Section 15251.

END OF SECTION

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SECTION 15080 – MISCELLANEOUS PIPING SPECIALS

STANDARD SPECIFICATION

SECTION 15080 MISCELLANEOUS PIPING SPECIALTIES

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes miscellaneous valves, fittings, piping materials and installation. Testing shall be in accordance with associated facilities.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Cold Applied Wax Tape Coating and Polyethylene Sheet or Tube Encasement: STD SPEC 09952.
- D. Steel Transmission Pipe: STD SPEC 15061.
- E. Disinfection of Piping: STD SPEC 15141.
- F. Pressure Testing of Piping: STD SPEC 15144.

1.03 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Submit manufacturer's catalog data, descriptive literature and assembly drawings. Show dimensions, materials of construction by specification reference and grade, linings and coatings.

PART 2 - MATERIALS

2.01 GENERAL

Valves and miscellaneous components are identified on the Standard Drawings by size and type.

2.02 CORPORATION STOPS - BRONZE, 2 INCHES AND SMALLER

For working pressures from zero to 300 psi, use corporation stops per OMWD AML. Stops shall be bronze (ASTM B 62) with inlet male iron pipe threads and outlet with quick joint for copper water tube. Quick joint shall consist of a threaded nut, an external nut stop, stainless steel gripper ring, and gasket. Gripper rings can only be used once. If the threaded nut of the quick joint is loosened after assembly and the copper water tube removed from the corporation stop, a new gripper ring shall be used in the reinstallation of the copper water tube and the corporation stop. Compression or pack joints will not be allowed.

SECTION 15080 – MISCELLANEOUS PIPING SPECIALS

2.03 BALL VALVES - BRONZE, 2 INCHES AND SMALLER

- A. For 1-inch and 2-inch valves with working pressures from zero to 300 psi valves shall be bronze (ASTM B 62) with both ends female iron pipe threads and full port per OMWD AML.
- B. For 1/2-inch valves with working pressures from zero to 600 psi valves shall have threaded ends, two-piece bronze body, standard port, bronze trim, chrome plated ball, and blowout proof stem per OMWD AML. Use a lever handle for non-buried installations and a tee handle for buried installations.

2.04 ANGLE VALVES - BRONZE, 2 INCHES AND SMALLER

For working pressures from zero to 300 psi valves shall be bronze (ASTM B 62), union bonnet, angle design, 300 psi WOG rated with both ends female iron pipe threads per OMWD AML.

2.05 ANGLE VALVES - BRONZE HYDRANT HEAD

For working pressures from zero to 300 psi valves shall be bronze (ASTM B 62) with 4-inch inlet female iron pipe threads and 2-1/2-inch outlet male national standard hose threads with cap and chain per OMWD AML.

2.06 ISOLATION UNION

See Standard Specification Section 15080 and Standard Drawing G-15. Use isolation union on installations wherever dissimilar metals are connected. Use isolation union with service saddles on ductile iron pipe installations with working pressures of 200 psi or less. Use isolation union at steel weld on outlets with working pressure of 200 psi or less.

2.07 SERVICE SADDLES - BRONZE, 2 INCHES AND SMALLER

- A. Perform wet taps on existing asbestos cement pipe, ductile iron pipe, and PVC pressure pipe with working pressures 200 psi or less. Provide service saddles that have been specifically designed to fit the type, size, and class of pipe of the installation per OMWD AML.
- B. Provide service saddles with full width, cast bronze bodies conforming to ASTM B 62, O-ring gaskets, and iron pipe threads. Provide Type 304 stainless steel double band straps with four bolts or a single wide strap with four bolts. All stainless steel shall be fully passivated for enhanced corrosion resistance. Use tapping machines and cutting tools that have been specifically designed for the type of pipe to be drilled and are hand operated only no mechanized tools will be used.

SECTION 15080 – MISCELLANEOUS PIPING SPECIALS

2.08 TAPPING SLEEVES

- A. Perform wet taps on existing asbestos cement pipe, ductile iron pipe, and PVC pressure pipe with working pressures 150 psi or less. Provide tapping sleeves that have been specifically designed to fit the type, size and class of pipe of the installation per OMWD AML.
- B. Tapping sleeves shall be of Type 304 stainless steel construction with two half sleeves and flanged outlet per OMWD AML. Sleeve halves shall be bolted together with stainless steel bolts and nuts. Gaskets shall completely surround the pipe to be tapped and be the same length as the sleeves. Gaskets shall be SBR conforming to ASTM D 2000. Flanged outlet shall be flat faced conforming to ANSI B16.5, Class 150. Use tapping machines and cutting tools that have been specifically designed for the type of pipe to be tapped.

PART 3 - EXECUTION

3.01 INSTALLATION

Installation shall be in accordance with manufacturer's recommendations. Tightening of nuts, bolts, screws, flanges shall be accomplished so that zero leakage is obtained.

- A. Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads before installing screwed valves.
- B. Lubricate bolt threads with oil or graphite prior to installation.
- C. Tighten nuts uniformly and progressively.
- D. After testing, coat exposed surfaces of bolts and nuts to be buried with primer for wax tape coating per Standard Specification Section 09952.

3.02 PRESSURE TESTING

Test miscellaneous piping specialties at the same time that the connecting pipelines are pressure tested. See Standard Specification Section 15144 for pressure testing requirements. Repair leaks in piping and retest.

3.03 DISINFECTION

See Standard Specification Section 15141 for chlorination requirements.

END OF SECTION

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SECTION 15122 – FLEXIBLE PIPE COUPLINGS

STANDARD SPECIFICATION SECTION 15122 FLEXIBLE PIPE COUPLINGS

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, installation, and testing of flexible pipe couplings for steel pipe, PVC pressure pipe, PVC distribution pipe, and ductile iron pipe.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Painting and Coating: STD SPEC 09900.
- D. Cold Applied Wax Tape Coating and Polyethylene Sheet or Tube Encasement: STD SPEC 09952.
- E. Fusion-Bonded Epoxy Lining and Coating: STD SPEC 09961.
- F. Corrosion Control for Buried Piping: STD SPEC 15310.
- G. General Piping Requirements: STD SPEC 15050.
- H. Disinfection of Piping: STD SPEC 15141.
- I. Pressure Testing of Piping: STD SPEC 15144.

1.03 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Submit manufacturer's catalog data, descriptive literature, and assembly drawings. Show manufacturer's model or figure number for each type of coupling or joint for each type of pipe material for which couplings are used.
- C. Submit manufacturer's recommended torques to which the coupling bolts shall be tightened.
- D. Show dimensions, materials of construction by specification reference and grade, linings, and coatings.
- E. Show number, size and material of construction of the rods and lugs for each joint harness on the project.

SECTION 15122 – FLEXIBLE PIPE COUPLINGS

PART 2 - MATERIALS

2.01 COUPLING SYSTEM DESIGN AND COMPONENT UNIT RESPONSIBILITY

Gaskets, bolts, nuts, glands, end rings, and hardware for pipe couplings of all types shall be furnished by the manufacturer of the pipe coupling and shall be designed as an integral system by the pipe coupling manufacturer. Gaskets shall be designed for the coupling and appropriately sized to provide a watertight seal at the design pressure and temperature. Gaskets, bolts, nuts, glands, end rings, and hardware for pipe couplings shall be shipped with the pipe coupling and shall be clearly labeled indicating the origin of the material, including place and date of manufacture. Manufacturer's printed installation instructions shall be packaged with each pipe coupling.

2.02 STEEL FLEXIBLE PIPE COUPLINGS

- A. Steel couplings shall have center sleeves and end rings made of carbon steel conforming to AWWA C219, Section 4. Minimum center sleeve length shall be 5 inches for pipe sizes 3/4-inch through 4-1/2 inches; 7 inches for pipe sizes 5 inches through 24 inches; and 10 inches for pipe sizes larger than 24 inches.
- B. Sleeve bolts in exposed service or buried shall be Type 304 stainless steel per AWWA C219, Section 4.
- C. Steel end follower rings shall be cast, forged, or hot rolled in one piece. Do not use rings fabricated from two or more shapes.
- D. Wall thickness of sleeve shall be at least that specified for the size of pipe in which the coupling is to be used.
- E. Gaskets shall be Buna-N.

2.03 DUCTILE IRON FLEXIBLE PIPE COUPLINGS

- A. Couplings shall have center sleeves and end rings made of ductile iron conforming to AWWA C219, Section 4.
- B. Sleeve bolts in exposed service or buried shall be Type 304 stainless steel per AWWA C219, Section 4.
- C. Gaskets shall be Buna-N.

2.04 FLEXIBLE PIPE COUPLINGS FOR PLAIN END STEEL PIPE, PLAIN END DUCTILE IRON PIPE, PVC PRESSURE PIPE

Provide coupling per OMWD AML.

2.05 TRANSITION COUPLINGS

Couplings for connecting different pipes having different outside diameters shall be per OMWD AML. Couplings shall have an integral full circumference ring pipe stop at the

SECTION 15122 – FLEXIBLE PIPE COUPLINGS

midpoint of the coupling. Inside diameter of coupling pipe stop shall equal inside diameter of smaller diameter pipe.

2.06 FLANGED COUPLING ADAPTERS FOR STEEL PIPE, ASBESTOS CEMENT PIPE, DUCTILE IRON PIPE OR PVC PRESSURE PIPE

Adapters shall be per OMD AML. Flange ends shall match the flange of the connecting pipe.

2.07 LINING AND COATING FOR COUPLINGS

Coat interior and exterior ferrous surfaces of flexible pipe couplings, transition couplings, and flanged coupling adapters with fusion-bonded epoxy per Standard Specification Section 09961. Coating shall be holiday free on interior surfaces.

2.08 JOINT HARNESSSES

- A. Provide joint harnesses for flexible pipe couplings located in vaults and structures where the piping is not restrained or anchored. Joint harnesses of this design shall be limited to a maximum pipe size of 8 inches and only applies to steel pipe.
- B. Steel ring plates shall conform to ASTM A 36; ASTM A 283, Grade B, C or D; or ASTM A 285, Grade C. Ring plates shall be as shown on the Drawings.
- C. Tie bolts or studs shall be as shown in the following table. Bolt or stud material shall be high-strength alloy steel conforming to ASTM A 193, Grade B7. Nuts shall conform to ASTM A 194, Grade 2H.

<u>Nominal Pipe Size (inches)</u>	<u>Number of Bolts/Studs</u>	<u>Diameter (inches)</u>
2	2	5/8
3	2	5/8
4	2	5/8
6	2	5/8
8	2	5/8

- D. Provide washers for each nut. Washers shall be of the same material as the nuts.

2.09 BOLTS, NUTS AND GASKETS FOR FLANGES

See Standard Specification Section 15050.

2.10 WAX TAPE COATING

See Standard Specification Section 09952.

2.11 WAX TAPE COATING AND POLYETHYLENE ENCASEMENT

See Standard Specification Section 09952.

SECTION 15122 – FLEXIBLE PIPE COUPLINGS

2.12 CORROSION CONTROL COMPONENTS

See Standard Specification Section 15310.

PART 3 - EXECUTION

3.01 INSTALLING COUPLINGS OR ADAPTERS

- A. Clean oil, grease, scale, and dirt from pipe ends. Repair any damage or holidays in the shop applied coating before installing couplings or adapters. Clean gaskets in flexible pipe couplings, transition couplings, and flanged coupling adapters before installing.
- B. Clean sleeve bolts and nuts by wire brushing before installing in end rings. Lubricate threads of bolts and nuts with oil or graphite prior to installation. Tighten nuts uniformly and in a progressive diametrically opposite sequence, and torque with a calibrated torque wrench.
- C. If couplings or adapters leak under pressure testing, loosen or remove the nuts and sleeve bolts, reset or replace the gaskets, reinstall or retighten the bolts and nuts, and retest the coupling or adapter. Couplings and adapters shall be watertight.
- D. After testing, wrap sleeve bolts and nuts of buried couplings or adapters with wax tape coating per Standard Specification Section 09952.
- E. Wrap buried couplings and adapters with polyethylene material per Standard Specification Section 09954.
- F. Where couplings or adapters are installed on buried metallic pipe, provide bond wires across the coupling and bond the follower ring to the pipe per Standard Specification Section 15310.

3.02 INSTALLING FLANGED JOINTS

See Standard Specification Section 15050 for installation instructions.

3.03 PAINTING AND COATING

Coat flexible pipe couplings, transition couplings, flanged coupling adapters and joint harnesses located aboveground, or in vaults and structures, the same as the adjacent pipes and per Standard Specification Section 09900. Do not apply flame spray coating to fusion-bonded epoxy coated couplings. Apply finish coats in the field. Color of finish coat shall match color of the adjacent piping.

3.04 PRESSURE TESTING

Test couplings and adapters at the same time that the connecting pipelines are pressure tested. See Standard Specification Section 15144 for pressure testing requirements. Repair leaks in piping and retest.

SECTION 15122 – FLEXIBLE PIPE COUPLINGS

3.05 DISINFECTION

See Standard Specification Section 15141 for chlorination requirements.

END OF SECTION

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SECTION 15240 – DUCTILE IRON PIPE

STANDARD SPECIFICATION SECTION 15240 DUCTILE IRON PIPE

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, installation, and testing of ductile iron pipe and fittings. Size range is 4- to 24-inch nominal pipe size.

1.02 PIPE IDENTIFICATION SYMBOLS

Interpret pipe identification symbols used on the Drawings as follows: DI-12"-350 or DI-12"-53 designates type of pipe (ductile iron); nominal pipe size (12 inches); and pipe wall thickness (pressure Class 350 or special thickness Class 53).

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Dewatering: STD SPEC 02140.
- D. Trenching, Backfilling, and Compacting: STD SPEC 02223.
- E. General Concrete Construction: STD SPEC 03000.
- F. Miscellaneous Metalwork: STD SPEC 05121.
- G. Painting and Coating: STD SPEC 09900.
- H. Cold Applied Wax Tape Coating and Polyethylene Sheet or Tube Encasement: STD SPEC 09952.
- I. Fusion-Bonded Epoxy Linings and Coatings STD SPEC 09961
- J. Corrosion Control for Buried Piping: STD SPEC 15310.
- K. General Piping Requirements: STD SPEC 15050.
- L. Miscellaneous Piping Specialties: STD SPEC 15080.
- M. Flexible Pipe Couplings: STD SPEC 15122.
- N. Disinfection of Piping: STD SPEC 15141.
- O. Pressure Testing of Piping: STD SPEC 15144.

SECTION 15240 – DUCTILE IRON PIPE

1.04 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Provide affidavit of compliance with standards referenced in this specification, e.g. AWWA C151. Submit copy of report of pressure tests for qualifying the designs of all sizes and types of AWWA C153 fittings that are being used in the project. The pressure test shall demonstrate that the minimum safety factor described in AWWA C153, Section 5.5, is met.
- C. Submit manufacturer's data sheets on ductile iron pipe, joints, and fittings including dimensions, wall thickness, weight, coating, lining, and deflections at flange and mechanical joints.
- D. Submit tabulated layout schedule and drawing showing location and dimensions of pipe and fittings including:
 - 1. Pipe station and top of pipe or centerline elevation at each change of grade and alignment.
 - 2. Elements of curves and bends, both in horizontal and vertical alignment, including elements of the resultant true angular deflections in cases of combined curvature.
 - 3. The limits of each reach of pipe pressure class or thickness class and of restrained joints.
 - 4. The limits of each reach of concrete encasement or encasement in casing.
 - 5. Locations and details of bulkheads for field hydrostatic testing of the pipeline.
 - 6. Locations of closures for length adjustment and for construction convenience.
 - 7. Locations of manholes and other points of access for placement of mortar lining at field joints and removal of test bulkheads.
 - 8. Locations of valves and other mechanical equipment.
- E. Submit calculations and test data proving that the proposed restrained joint arrangement can transmit the required forces with a minimum safety factor of 3.
- F. Submit certificate that cement for mortar lining complies with ASTM C 150, designating type.
- G. Submit test report on physical properties of rubber compound used in the gaskets.
- H. Submit manufacturer's catalog data and descriptive literature on marking tape.

1.05 INSPECTION AND FIELD VERIFICATION

- A. The District's Representative or authorized representative may inspect materials, production, and testing of pipes, fittings, and special pieces at manufacturer's plant.

SECTION 15240 – DUCTILE IRON PIPE

- B. Where new pipelines are to be connected to existing waterlines of the District, the Contractor shall verify in the field the location, elevation, pipe material, pipe outside diameter, and any other characteristics of the existing waterline before proceeding with the installation. This field verification shall be performed in the presence of the District's Representative. Adjust and align the new piping as necessary to meet the field conditions and provide all required material, labor, and equipment to make the connection.

PART 2 - MATERIALS

2.01 DUCTILE IRON PIPE

Pipe shall be ductile iron conforming to AWWA C151. Provide pipe in nominal 18- or 20-foot laying lengths.

2.02 PIPE MARKING

Plainly mark each length of straight pipe to identify the design pressure class or thickness class, the wall thickness, and date of manufacture. Mark the spigot end of restrained joint pipe to show clearly the required depth of insertion into the bell.

2.03 PIPE WALL THICKNESS

- A. Minimum wall thickness for pipe having flange or mechanical joints, restrained joints, plain ends, or cast flange ends shall be Pressure Class 350, unless otherwise shown on the Drawings.
- B. Minimum wall thickness for pipe having threaded flanges shall be Special Thickness Class 53 per AWWA C151.
- C. Minimum wall thickness for pipe having grooved end joints shall be as shown in the following table unless otherwise noted on the Drawings:

<u>Pipe and Fitting Size (inches)</u>	<u>Special Thickness Per AWWA C151</u>
16 and Smaller	Class 53
18	Class 54
20	Class 55
24	Class 56

2.04 FITTINGS

- A. Provide ductile iron flange or mechanical joint fittings conforming to AWWA C110 with a rated working pressure of 350 psi.
- B. In lieu of paragraph 2.04, A., provide ductile iron fittings conforming to AWWA C153 with a minimum rated working pressure of 350 psi. Provide fittings constructed of Grade 70-50-05 ductile iron having a minimum weight equal to the weight tabulated in AWWA C153. Use mechanical joint fittings or fittings with bells and gasket ends conforming to the dimensional values of AWWA C111. Mechanical joint glands shall be Grade 70-50-05 ductile iron and

SECTION 15240 – DUCTILE IRON PIPE

cast in one continuous ring. Fittings with repaired defects are not acceptable and will be rejected.

- C. For mechanical joint fittings with glands, use tee-head or non-hex head bolts and head nuts for joint makeup and gasket seating. Bolts and nuts shall be carbon steel and coated with a corrosion inhibiting fluoropolymer composite material.
- D. For grooved end fittings, use ductile iron fittings conforming to AWWA C110 or C153. Grooves or shouldered ends shall conform to AWWA C606.
- E. Material for fittings with welded on bosses shall have a Charpy notch impact value of minimum 10 ft-lbs under the conditions defined in AWWA C151. Test completed welds by the liquid penetrant method per ASTM E 165.

2.05 FLANGES

- A. Flanges on ductile iron fittings shall conform to AWWA C110 or ASME B16.42 Class 150 with a minimum rated working pressure of 250 psi.
- B. For flanged fittings with working pressures greater than 250 psi, use ductile iron fittings conforming to ANSI B16.42 Class 300.
- C. Threaded flanges shall be solid back, flat faced, Class 125 per AWWA C115.
- D. Flanged pipe shall be either cast or threaded. Flanged pipe shall be shop fabricated, not field fabricated. Threaded flanges shall comply with AWWA C115. Flanges shall be individually fitted and machine tightened in the shop, then machined flat and perpendicular to the pipe barrel. Flanges shall be backfaced parallel to the face of flange. Prior to assembly of the flange onto the pipe, apply a thread compound to the threads to provide a leak-free connection. There shall be zero leakage through the threads at a hydrostatic test pressure of 250 psi without the use of the gasket.
- E. Material for blind flanges shall be ductile iron.

2.06 LINING AND COATING FOR PIPE AND FITTINGS

- A. Line interior of potable or recycled water pipe and fittings with cement mortar per AWWA C104. Provide double thickness lining and use cement conforming to ASTM C 150, Type II. Also, line interior of bells and pipe spigots in contact with water per Standard Specification Section 09900, System No. 5, and be holiday free. Apply linings in shop.
- B. Coat exterior of buried pipe and fittings with an asphalt material per AWWA C151. Apply coating in shop.
- C. Coat blind flanges per Standard Specification Section 09900, System No. 5, and be holiday free. Apply coating in shop.
- D. Coat the grooved and shouldered ends of pipe to be in contact with mechanical clamp-type couplings per Standard Specification Section 09900, System No. 5, and be holiday free. Apply coating in shop.

SECTION 15240 – DUCTILE IRON PIPE

- E. Coat the ends of plain end pipe where flexible pipe couplings are to be installed per Standard Specification Section 09900, System No. 5, and be holiday free. Apply coating in shop.

2.07 BOLTS, NUTS AND GASKETS FOR FLANGES

See Standard Specification Section 15050.

2.08 INSULATING FLANGE KITS

See Standard Specification Section 13110.

2.09 OUTLETS

- A. For outlets 2 inches and smaller with working pressures 200 psi or less, drill the pipe and attach a service saddle to the pipe except for sewer applications. Provide service saddles with full width O-ring gaskets, and iron pipe threads. Provide Type 304 stainless steel double band straps with four bolts or a single wide strap with four bolts. All stainless steel shall be fully passivated for enhanced corrosion resistance. Service saddles shall be Ford Style 202BS, Romac Industries Style 202BS, Smith-Blair Model 393, or District approved equal.
- B. For outlets 2 inches and smaller with working pressures greater than 200 psi and all sewer applications, use a ductile iron tee with a flanged outlet. Install a ductile iron reducing flange with iron pipe threads and insulating bushing on the outlet.
- C. For outlets 3 inches and larger, use a ductile iron tee with a flanged outlet.

2.10 MECHANICAL CLAMP-TYPE COUPLINGS AND ADAPTER FLANGES

- A. Mechanical clamp-type couplings and flange adapters for grooved end pipe shall be ductile iron, ASTM A 536 Grade 65-45-12. Bolts shall conform to ASTM A 183, 110,000 psi tensile strength. Gaskets shall be EPDM (ethylene propylene diene monomer) for water and Buna-N for sewer and shall conform to ASTM D 2000.
- B. Couplings for pipe, 24 inches and smaller, shall conform to AWWA C606 for flexible radius ductile iron pipe, except where rigid radius couplings are required to connect to fittings. Couplings shall be Victaulic Style 31 or District approved equal.
- C. Grooved end flange adapters for piping having an operating pressure of 150 psi and less shall be Victaulic Style 341 or 342, or District approved equal. Flange dimensions shall conform to ASME B16.1 Class 125.

2.11 FLEXIBLE PIPE COUPLINGS

See Standard Specification Section 15122.

2.12 TYPE OF PIPE JOINTS

- A. Joints in aboveground piping or piping located in vaults and structures shall be flanged, unless mechanical clamp-type couplings or adapter flanges are shown on the Drawings.

SECTION 15240 – DUCTILE IRON PIPE

- B. Joints in buried piping shall be of the flanged, or restrained mechanical joint type per AWWA C111 except where flanged joints are required to connect to valves, meters, and other equipment. Provide unrestrained buried joints except where restrained joints are specifically shown on the Drawings. Restrained push-on joints per Approved Materials List. All weldments for restrained joints shall be tested by the liquid penetrant method per ASTM E 165. Provide plain end pipe where flexible pipe couplings are to be used.

2.13 MECHANICAL JOINT RESTRAINT SYSTEM

The restraining mechanism shall consist of a follower gland having a seal gasket and individually actuated wedges that increase their resistance to pullout as pressure or external forces increase. The system manufacturer shall provide all the components (follower ring, wedges, and gaskets) for the restraining device. The device shall be capable of full mechanical joint deflection during assembly and the flexibility of the joint shall be maintained after burial. The joint restraint ring and its wedging components shall be constructed of ductile iron conforming to ASTM A 536, Grade 60-42-10. The wedges shall be ductile iron, heat-treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with mechanical joint bells conforming to AWWA C111 and AWWA C153. The design shall use torque limiting twist-off nuts to provide actuation of the restraining wedges. The mechanical joint restraint shall be available in the size range of 4 through 24 inches. Minimum rated pressure shall be 350 psi for sizes 16 inches and smaller and 250 psi in sizes 18 inches and larger. Mechanical joint restraint shall be EBAA Iron, Inc. Megalug Series 1100, or District approved equal.

2.14 DUCTILE IRON PIPE WELDMENTS

- A. All welding to ductile iron pipe, such as for bosses or joint restraint shall be done at the place of manufacture of the pipe. Perform welding by skilled welders who have experience in the method and materials to be used. Welders shall be qualified under the standard qualification procedures of the ASME Boiler and Pressure Vessel Code, Section IX, Welding Qualifications.
- B. Welds shall be of uniform composition, neat, smooth, full strength, and ductile. Completely grind out porosity and cracks, trapped welding flux, and other defects in the welds in such a manner that will permit proper and complete repair by welding.
- C. Completed welds shall be inspected at the place of manufacture by the liquid penetrant method. Conform to the requirements specified in ASTM E 165, Method A, Type I or Type II. The materials used shall be water washable and nonflammable.

WAX TAPE COATING and POLYETHYLENE ENCASEMENT See *Standard Specification Section 09952*.

2.15 CORROSION CONTROL COMPONENTS

See Standard Specification Section 15310.

SECTION 15240 – DUCTILE IRON PIPE

2.16 CEMENT MORTAR

Cement mortar for buttering and pointing the inside joints shall consist of one part cement to 1-1/2 parts sand by damp loose volume. The quantity of mixing water shall be no more than necessary for handling and placing. Cement shall conform to ASTM C 150, Type II. Sand shall conform to ASTM C 144 for masonry sand.

2.17 MARKING TAPE

Use detectable marking tape consisting of one layer of aluminum foil laminated between two colored layers of inert plastic film. The lamination bond should be strong enough that the layers can not be separated by hand. Tape shall be a minimum of 5 mils thick and 6 inches wide. Tape shall bear a continuous, printed message every 16 to 36 inches warning of the installation buried below. Tape shall be Terra Tape, Linetec, or District approved equal.

2.18 MARKER POSTS

Provide marker posts for buried pipelines at 500 feet on center except where pipeline is located in a paved street or as directed by the District's Representative. Use construction heart garden grade redwood per Standard Specifications for Grades of California Redwood Lumber issued by the Redwood Inspection Service. Provide seasoned redwood, 4 inches by 4 inches, and surfaced on four sides.

PART 3 - EXECUTION

3.01 PRODUCT MARKING

Plainly mark each length of straight pipe to identify the ductile iron wall thickness and date of manufacturer. Mark the spigot end of restrained joint pipe to show clearly the required depth of insertion into the bell.

3.02 DELIVERY AND TEMPORARY STORAGE OF PIPE

- A. Limit onsite pipe storage to a maximum of one week. Place the pipe alongside the trench in the order in which it is to be installed and secure it from rolling. Support the pipe on wooden blocks, sandbags, mounds of sand, or other suitable supports. Do not roll or drop the pipe on the ground or allow the pipe to fall from the pipe trailer trucks.
- B. Avoid cracking of the cement mortar lining. If necessary, use plastic sheet bulkheads to close pipe ends and keep lining moist.
- C. Do not install pipe or fittings with damaged linings. Patch damaged areas in the field with material similar to the original. Where damage can not be repaired in the field, replace the defective pipe or fittings.

SECTION 15240 – DUCTILE IRON PIPE

3.03 HANDLING OF PIPE

Lift pipes with mechanical equipment using wide belt slings. Do not use cable slings or chains. Do not move pipe by inserting any devices or pieces of equipment into the pipe barrel.

3.04 SANITATION OF PIPE INTERIOR

- A. During laying operations, do not place tools, clothing, or other materials in the pipe. Keep the interior of the pipe clean as the pipeline construction progresses. The purpose of maintaining a clean interior is to aid in the passage of the bacteriologic quality testing after disinfection for potable water pipelines.
- B. When pipelaying is not in progress, including the noon hour, close the ends of the installed pipe with a plug to deter entry of vermin, children, dirt, storm water, or foreign material.

3.05 INSTALLING PIPE IN TRENCH

- A. See Standard Specification Section 02223 for earthwork requirements.
- B. Inspect each pipe and fitting before lowering into the trench. The District's Representative will inspect all pipe prior to installation for damage to the interior protective coatings. Patch damaged areas in the field with material similar to the original. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after laying.
- C. Handle pipe in a manner to avoid any damage to the pipe. Do not drag pipe over the ground, drop it onto the ground, or drop objects on it. Do not drop or dump pipe into trenches.
- D. Laying tolerances for the installed pipe shall not vary greater than 0.3-foot horizontally, or greater than 0.1-foot vertically from the alignment and elevations shown on the Drawings.
- E. Grade the bottom of the trench to the line and grade to which the pipe is to be laid. Remove hard spots that would prevent a uniform thickness of pipe base material (imported sand). Before laying each section of the pipe, check the grade and correct any irregularities found. The trench bottom shall form a continuous and uniform bearing and support for the pipe at every point between bell holes, except that the grade may be disturbed for the removal of pipe handling slings.
- F. At the location of each joint, dig bell holes in the bottom of the trench and at the sides to permit visual inspection of the entire joint and to prevent the pipe from being supported by the bell end or fitting.
- G. Keep the trench in a dewatered condition during pipelaying. Removal of water shall be in conformance with Standard Specification Section 02223.
- H. For pipes 24 inches in diameter, the amount of pipe to be laid and assembled in a trench shall be limited to a distance of approximately 320 feet. No additional pipe will be allowed to be installed in the trench until the other related operations of pipeline construction are completed. Other operations include, but are not limited to, bond wires, backfilling and

SECTION 15240 – DUCTILE IRON PIPE

compacting, completion of interior joints, and inspection of the interior by the District's Representative. The intent of this limitation is to provide a safe environment for the construction and inspection of the pipeline. The interior of the pipeline is considered a confined or enclosed space having a limited means of egress which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere.

3.06 INSTALLING WAX TAPE COATING AND POLYETHYLENE ENCASEMENT

- A. Wrap buried pipe, fittings, and flanged joints with polyethylene material per Standard Specification Section 09952. Use only tube type for pipe. Complete the wrap prior to placing concrete anchors, collars, supports or thrust blocks per Standard Specification Section 02223. Repair polyethylene material damaged during construction.

3.07 ASSEMBLING PIPE JOINTS

- A. The spigot and integral bell shall be dirt free and slide together without displacing the rubber ring gasket. Lay the pipe section with the integral bell facing the direction of laying. "
- B. Clean the groove of the bell of all foreign materials. Insert the gasket into the groove of the bell prior to installation. Observe the correct direction of the shaped gasket. Feel that the gasket is completely and evenly seated in the groove.
- C. Lubricate the exposed gasket surface and the beveled spigot up to the full insertion length with the lubricant supplied by the pipe manufacturer. If the lubricated pipe end touches dirt, clean the pipe end and reapply lubricant.
- D. Insert the spigot into the bell and force it slowly into position.
- E. Check that the rubber ring gasket has not left the groove during assembly by passing a feeler gage around the completed joint.
- F. Assemble restrained joints per manufacturer's instructions.

3.08 INSTALLING BURIED FITTINGS

- A. The District's Representative will inspect all fittings prior to installation for damage to the interior protective coatings. Coating shall be holiday free on interior surfaces. Patch damaged areas in the field with material similar to the original.
- B. For mechanical joint fittings, clean the bell socket and the plain end of the pipe of all foreign material and dirt. Place the gland on the pipe spigot with the lip extension toward the plain end. Lubricate the pipe spigot and gasket. Use the same lubricant as supplied by the pipe manufacturer. Install the gasket on the pipe spigot with the narrow edge of the gasket toward the plain end. Insert the pipe into the bell socket and press the gasket firmly into the gasket recess. Keep the joint straight during assembly. Push the gland towards the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand tighten nuts. Make joint deflection after assembly but before tightening nuts. Uniformly tighten bolts and nuts in a progressive diametrically opposite sequence, and torque nuts to 75- to 90-foot pounds with a calibrated torque wrench. Coat exposed surfaces of tee-head bolts and nuts after tightening with primer for wax tape coating per Standard Specification Section 09952.

SECTION 15240 – DUCTILE IRON PIPE

3.09 JOINT DEFLECTIONS FOR BURIED PIPE

- A. For restrained joints, do not exceed 80% of the manufacturer's recommended maximum deflection.

3.10 INSTALLING FLANGED JOINTS

See Standard Specification Section 15050 for installation instructions.

3.11 INSTALLING INSULATING FLANGE KITS

Install insulating flange kits with coatings per Standard Specification Section 15310.

3.12 INSTALLING SERVICE SADDLES

- A. Place the service saddle on the pipe and hand tighten the nuts while positioning the saddle in its final location. Uniformly tighten the nuts in a progressive diametrically opposite sequence and torque with a calibrated torque wrench to the saddle manufacturer's recommended values.
- B. Connect a corporation stop to the saddle per Standard Specification Section 15080. Apply Teflon joint compound or tape to the male threads before installing the corporation stop. Make joints watertight.
- C. Mount a tapping machine on the corporation stop to cut a hole in the pipe with a shell type cutter made specifically for ductile iron pipe. Do not use other devices or hand equipment to bore through the pipe wall.
- D. Wrap service saddle including body, straps, bolts, nuts, and adjacent surfaces of the pipe with polyethylene material per Standard Specification Section 09954

3.13 INSTALLING MECHANICAL CLAMP-TYPE COUPLINGS OR ADAPTER FLANGES

- A. Install mechanical clamp type couplings and adapter flanges on grooved end pipe and fittings in accordance with the manufacturer's recommendations and the following.
- B. Clean oil, grease, and dirt from the grooved end pipe and fittings. Repair any damage or holidays in the shop applied coating before installing coupling or adapter. Apply the coupling manufacturer's gasket lubricant to the gasket exterior including lips, pipe ends, and housing interiors.
- C. Lubricate threads of bolts and nuts with oil or graphite prior to installation. Uniformly tighten bolts and nuts alternately and evenly until coupling segments are seated. Use torques as recommended by the coupling manufacturer.

3.14 INSTALLING FLEXIBLE PIPE COUPLINGS

Install flexible pipe couplings per Standard Specification Section 15122.

SECTION 15240 – DUCTILE IRON PIPE

3.15 INSTALLING CORROSION CONTROL COMPONENTS

Install bond wires, anodes, and test stations per Standard Specification Section 15310.

3.16 POINTING INSIDE JOINT RECESSES FOR PIPES 24 INCHES IN DIAMETER

- A. Backfill the trench before pointing the inside joint recesses with cement mortar. Joints shall be pointed immediately after backfilling and at no time shall the completion of the pointing be further than 320 feet behind pipe laying.
- B. Working inside the pipe, remove foreign substances from joint recesses and pack with cement mortar. Finish the surface with a steel trowel to match adjoining pipe.
- C. Remove excess mortar and other construction debris from the pipe interior. Sweep pipe clean of all foreign substances.

3.17 INSTALLING MARKING TAPE

After the pipe zone has been backfilled and compacted, place the marking tape on the compacted pipe zone material and center over the pipe. Run tape continuously along the trench and tie ends of tape together. Wrap marking tape around valve box extension pipes and continue along pipe.

3.18 SETTING MARKER POSTS

Locate marker posts on centerline of pipeline and space at 500 feet on center. Cut redwood post to a 5-foot length and chamfer the top. Paint post per Standard Specification Section 09900, System No. 60. Use white paint for the finish coats. For potable water, use blue paint for the top 4 inches of the chamfered end and stencil in 2-inch-high blue letters the word "WATER" on the post. For recycled water, use purple paint for the top 4 inches of the chamfered end and stencil in 2-inch-high purple letters the abbreviation "RW" on the post. For sewer, use green paint for the top 4 inches of the chamfered end and stencil in 2-inch-high green letters the word "SEWER" on the post. Excavate a hole 16 inches in diameter by 2 feet deep. Set the redwood post plumb, fill hole with concrete to 2 inches above finish grade, and crown to slope away from post. Concrete shall be Class C per Standard Specification Section 03000.

3.19 PAINTING AND COATING

- A. Coat exterior surfaces of bare ductile iron pipe in vaults per Standard Specification Section 09900, System No. 10. Apply coats in the field.
- B. Coat exterior surfaces of mechanical clamp-type couplings, adapter flanges, and flexible pipe couplings the same as the adjacent pipes.

3.20 PRESSURE TESTING

See Standard Specification Section 15144 for pressure testing requirements.

SECTION 15240 – DUCTILE IRON PIPE

3.21 DISINFECTION

See Standard Specification Section 15141 for chlorination requirements.

END OF SECTION

SECTION 16000 – BASIC ELECTRICAL REQUIREMENTS

SECTION 16000 BASIC ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish all labor, materials, tools, and equipment, and perform all work and services necessary for, or incidental to, the furnishing and installation of all electrical work as shown on the Drawings, and as specified in accordance with the provisions of the Contract Documents, and completely coordinate with the work of other trades involved in the general construction. Although such work is not specifically shown or specified, all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, and complete installation shall be furnished and installed as part of this work. The Contractor shall obtain approved Shop Drawings showing wiring diagrams, connection diagrams, roughing-in, and hook up details for all equipment and comply therewith. All electrical work shall be complete and left in operating condition in accordance with the intent of the Drawings and the Specifications for the electrical work.
- B. The electrical scope of work for this project primarily includes, but is not limited to, the following:
1. Modifications to existing electrical equipment as shown on the Drawings and as specified herein.
 2. Furnish and install all aboveground raceway systems including conduit, fittings, boxes, supports, and other pertinent components.
 3. Furnish and install all underground raceway systems including conduit, fittings, manholes, handholes and other pertinent components.
 4. Other electrical work as specified herein and indicated on the Drawings.
- C. All material and equipment shall be the product of an established, reputable, and approved manufacturer; shall be new and of first-class construction; shall be designed and guaranteed to perform the service required; and shall bear the Label of approval of the Underwriters Laboratories, Inc., where such approval is available for the product of the listed manufacturer as approved by the Engineer.
- D. When a specified or indicated item has been superseded or is no longer available, the manufacturer's latest equivalent type or model of material or equipment as approved by the Engineer shall be furnished and installed at no additional cost to the Owner.
- E. Where the Contractor's selection of equipment of specified manufacturers or additionally approved manufacturers requires changes or additions to the system design, the

SECTION 16000 – BASIC ELECTRICAL REQUIREMENTS

Contractor shall be responsible in all respects for the modifications to all system designs, subject to approval of the Engineer. The Contractor's bid shall include all costs for all work of the Contract for all trades made necessary by such changes, additions or modifications or resulting from any approved substitution.

- F. Furnish and install all stands, racks, brackets, supports, and similar equipment required to properly serve the equipment which is furnished under this Contract, or equipment otherwise specified or indicated on the Drawings.
- G. All electrical components and systems (e.g., conduit and other raceways, freestanding equipment, etc.) and their anchorage, including electrical equipment foundations, shall be designed to resist the controlling load combination of gravity loads, operational forces, wind forces, seismic forces, thermal loads, and any other applicable forces required in accordance with the governing Building Code. Seismic design shall be in accordance with ASCE 7 Chapter 13 unless the nonstructural component meets the criteria to be exempt.

1.02 EQUIPMENT LOCATION

- A. The Drawings show the general location of feeders, transformers, equipment, devices, conduits, and circuit arrangements. Because of the small scale of the Drawings, it is not possible to indicate all of the details involved. The Contractor shall carefully investigate the structural and finish conditions affecting the work and shall arrange such work accordingly. Contractor shall furnish and install such fittings, junction boxes, and accessories as may be required to meet such conditions. The Contractor shall refer to the entire Drawing set to verify openings, special surfaces, and location of other equipment, or other special equipment prior to roughing-in for panels, switches, and other outlets. The Contractor shall verify all equipment dimensions to ensure that proposed equipment will fit properly in spaces indicated.
- B. Where outlets are shown near identified equipment furnished by this or other Contractors, it is the intent of the Specifications and Drawings that the outlet be located at the equipment to be served. The Contractor shall coordinate the location of these outlets to be near the final location of the equipment served whether placed correctly or incorrectly on the Drawings.

1.03 LOCAL CONDITIONS

- A. The Contractor shall examine the site and become familiar with conditions affecting the work. The Contractor shall investigate, determine, and verify locations of any overhead or buried utilities on or near the site, and shall determine such locations in conjunction with all public and/or private utility companies and with all authorities having jurisdiction (AHJs). All costs, both temporary and permanent to connect all utilities, shall be included in the Bid. The Contractor shall be responsible for scheduling and coordinating with the local utility for temporary and permanent services.

SECTION 16000 – BASIC ELECTRICAL REQUIREMENTS

- B. In addition, the Contractor shall relocate all duct banks, lighting fixtures, receptacles, switches, boxes, and other electrical equipment as necessary to facilitate the Work included in this project. Costs for such work shall be included in the Bid.
- C. The Contractor is responsible for coordinating all electric utility equipment installations with the serving electric utility. The Contractor shall furnish and install all electric utility equipment required by the electric utility to be installed by the Contractor whether specifically shown on the Drawings or not.

1.04 SUBMITTALS

- A. In accordance with the procedures and requirements set forth in Section 01300 – Record Drawings and Submittals and the requirements of the individual Specification Sections, the Contractor shall obtain from the equipment manufacturer and submit the following:
 - 1. Shop Drawings
 - 2. Operation and Maintenance Manuals
 - 3. Spare Parts List
 - 4. Proposed Testing Methods and Reports of Certified Shop Tests
 - 5. Reports of Certified Field Tests
 - 6. Manufacturer's Representative's Certification
- B. Submittals shall be sufficiently complete in detail to enable the Engineer to determine compliance with Contract requirements.
- C. Submittals will be approved only to the extent of the information shown. Approval of an item of equipment shall not be construed to mean approval for components of that item for which the Contractor has provided no information.
- D. Some individual electrical specification sections may require a Compliance, Deviations, and Exceptions (CD&E) letter to be submitted. If the CD&E letter is required and shop drawings are submitted without the letter, the submittal will be rejected. The letter shall include all comments, deviations, and exceptions taken to the Drawings and Specifications by the Contractor AND Equipment Manufacturer/Supplier. This letter shall include a copy of the applicable specification section(s). In the left margin beside each and every paragraph/item, a letter "C", "D", or "E" shall be typed or written in. The letter "C" shall be for full compliance with the requirement. The letter "D" shall be for a deviation from the requirement. The letter "E" shall be for taking exception to a requirement. Any requirements with the letter "D" or "E" beside them shall be provided with a full typewritten explanation of the deviation/exception. Handwritten explanation of

SECTION 16000 – BASIC ELECTRICAL REQUIREMENTS

the deviations/exceptions is not acceptable. The CD&E letter shall also address deviations and exceptions taken to each Drawing related to the applicable specification section(s).

- E. Submit design for all nonstructural electrical components and systems and their anchorage in accordance with the governing Building Code.

1.05 APPLICABLE CODES AND REQUIREMENTS

A. Conformance

1. Unless otherwise noted, all work, equipment, and materials furnished shall conform with the latest available version of the rules, requirements, and specifications of the following:
 - a. Insurance Rating Organization having jurisdiction.
 - b. The serving electric utility company.
 - c. The currently adopted edition of the National Electrical Code (NEC).
 - d. The National Electric Manufacturers Association (NEMA).
 - e. The Institute of Electrical and Electronic Engineers (IEEE).
 - f. The Insulated Cable Engineers Association (ICEA).
 - g. The American Society of Testing Materials (ASTM).
 - h. The American National Standards Institute (ANSI).
 - i. The requirements of the Occupational Safety Hazards Act (OSHA).
 - j. The National Electrical Contractors Association (NECA) Standard of Installation.
 - k. National Fire Protection Association (NFPA).
 - l. InterNational Electrical Testing Association (NETA).
 - m. All other applicable Federal, State/Commonwealth, and local laws and/or ordinances.
2. All equipment and materials shall be Listed by and shall bear the Label of Underwriter's Laboratories, Incorporated (UL), if the material and equipment is of the type/class inspected by said laboratories.

B. Nonconformance

SECTION 16000 – BASIC ELECTRICAL REQUIREMENTS

1. Any paragraph of requirements in these Specifications or Drawings deviating from the rules, requirements, and specifications of the above organizations shall be invalid and their (the above organizations) requirements shall hold precedent thereto. The Contractor shall be held responsible for adherence to all rules, requirements, and specifications as set forth above. Any additional work or material necessary for adherence will not be allowed as an extra, but shall be included in the Bid. Ignorance of any rule, requirement, or specification shall not be allowed as an excuse for nonconformity. Acceptance by the Engineer does not relieve the Contractor from the expense involved for the correction of any errors which may exist in the drawings submitted or in the satisfactory operation of any equipment.

C. Certification

1. Where applicable, upon completion of the work, the Contractor shall obtain certificate(s) of inspection and approval from the inspection organization having jurisdiction and shall deliver same to the Engineer and the Owner.

1.06 EQUIPMENT, MATERIALS, AND AND STORAGE

- A. Materials arriving on the job site shall be stored in such a manner as to keep material free of rust and dirt and to keep material properly aligned and true to shape. Rusty, dirty, or misaligned material will be rejected. Electrical conduit shall be stored to provide protection from the weather and accidental damage. Rigid non-metallic conduit shall be stored on even supports and in locations not subject to direct sun rays or excessive heat. Cables shall be sealed, stored, and handled carefully to avoid damage to the outer covering or insulation and damage from moisture and weather. Adequate protection shall be required at all times for electrical equipment and accessories until installed and accepted. Materials damaged during shipment, storage, installation, or testing shall be replaced or repaired in a manner meeting with the approval of the Engineer. If space heaters are provided in a piece of electrical equipment, they shall be temporarily connected to a power source during storage.

1.07 WARRANTIES

- A. Unless otherwise specified in an individual specification section, all electrical equipment and electrical construction materials shall be provided with a warranty in accordance with the requirements of General Provisions.

PART 2 – PRODUCTS

2.01 PRODUCT REQUIREMENTS

- A. Unless otherwise indicated, the materials to be provided under this Specification shall be the products of manufacturers regularly engaged in the production of all such items and

SECTION 16000 – BASIC ELECTRICAL REQUIREMENTS

shall be the manufacturer's latest design. The products shall conform to the applicable standards of UL and NEMA, unless specified otherwise. International Electrotechnical Commission (IEC) standards are not recognized. Equipment designed, manufactured, and labeled in compliance with IEC standards is not acceptable.

- B. All items of the same type or ratings shall be identical. This shall be further understood to include products with the accessories indicated.
- C. All equipment and materials shall be new, unless indicated or specified otherwise.
- D. The Contractor shall submit proof if requested by the Engineer that the materials, appliances, equipment, and/or devices that are provided under this Contract meet the requirements of Underwriters Laboratories, Inc. with regard to fire and casualty hazards. Documentation indicating Listing and Labeling by Underwriters Laboratories, Inc., will be accepted as meeting this requirement.
- E. Where the above items are Labeled by (bearing the certification mark of) an OSHA Nationally Recognized Testing Laboratory (NRTL) other than UL, and the NRTL is authorized by the Occupational Safety and Health Administration (OSHA) to test and certify those items to the same standard(s), then the certification mark of that NRTL shall be considered equivalent to the 'UL' certification mark.

2.02 SUBSTITUTIONS

- A. Unless specifically noted otherwise, any reference in the Specifications or on the Drawings to any article, service, product, material, fixture, or item of equipment by name, make, or catalog number shall be interpreted as establishing the type, function, and standard of quality and shall not be construed as limiting competition. The Contractor, in such cases may use any article, device, product, material, fixture, or item of equipment which in the judgment of the Engineer, expressed in writing, is equal to that specified.

2.03 CONCRETE

- A. The Contractor shall furnish all concrete required for the installation of all electrical work. Concrete shall be Class A unless otherwise specified. Concrete and reinforcing steel shall meet the appropriate requirements of Division 03 of the Specifications.
- B. The Contractor shall provide concrete equipment pads for all free-standing electrical apparatus and equipment located on new or existing floors or slabs. The Contractor shall provide all necessary anchor bolts, channel iron sills, and other materials as required. The exact location and dimensions shall be coordinated for each piece of equipment well in advance of the scheduled placing of these pads. Equipment pads shall be 4 inches high unless otherwise indicated on the Drawings and shall conform to the Standard Detail for equipment pads shown on the Drawings. Equipment pads shall not have more than 3 inches of excess concrete beyond the edges of the equipment.

SECTION 16000 – BASIC ELECTRICAL REQUIREMENTS

- C. The Contractor shall provide concrete foundations for all free-standing electrical apparatus and equipment located outdoors or where floors or slabs do not exist and/or are not or provided by others under this Contract. The Contractor shall provide all necessary anchor bolts, channel iron sills, and other materials as required. The location and dimensions shall be coordinated for each piece of equipment well in advance of the scheduled placing of the foundations. Equipment foundations shall be constructed as detailed on the Drawings or if not detailed on the Drawings shall be 6 inches thick minimum reinforced with #4 bars at 12-inch centers each way placed mid-depth. Concrete shall extend 6 inches minimum beyond the extreme of the equipment base and be placed on a compacted stone bed (#57 stone or ABC) 6 inches thick minimum.

PART 3 – EXECUTION

3.01 CUTTING AND PATCHING

A. Coordination

1. The Work shall be coordinated between all trades to avoid delays and unnecessary cutting, channeling, and drilling. Sleeves shall be placed in concrete for passage of conduit wherever possible.

B. Damage

1. The Contractor shall perform all chasing, channeling, drilling, and patching necessary to the proper execution of this Contract. Any damage to the building, structure, or any equipment shall be repaired by qualified mechanics of the trades involved at the Contractor's expense. If, in the Engineer's judgment, the repair of damaged equipment would not be satisfactory, then the Contractor shall replace damaged equipment at the Contractor's expense.

C. Existing Equipment

1. Provide a suitable cover or plug for openings created in existing equipment as the result of work under this Contract. For example, provide round plugs in equipment enclosures where the removal of a conduit creates a hole and the enclosure. Covers and plugs shall maintain the NEMA rating of the equipment enclosure. Covers and plugs shall be watertight when installed in equipment located outdoors.

3.02 EXCAVATION AND BACKFILLING

- A. The Contractor shall perform all excavation and backfill required for the installation of all electrical work. All excavation and backfilling shall be in complete accordance with the applicable requirements of Division 2.

SECTION 16000 – BASIC ELECTRICAL REQUIREMENTS

3.03 CORROSION PROTECTION

- A. Wherever dissimilar metals, except conduit and conduit fittings, come into contact, the Contractor shall isolate these metals as required with neoprene washers, nine (9) mil polyethylene tape, or gaskets.

END OF SECTION

SECTION 16111 – CONDUIT

SECTION 16111 CONDUIT

PART 1 – GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish and install conduits, conduit fittings, and appurtenances to complete the installation of all electrically operated equipment as specified herein, indicated on the Drawings, and as required.
- B. Reference Specification Section 16000 – Basic Electrical Requirements.

1.02 CODES AND STANDARDS

- A. All equipment and materials shall be Listed by and shall bear the Label of Underwriter's Laboratories, Incorporated (UL).
- B. Conduits, conduit fittings, and appurtenances shall be designed, manufactured, and/or Listed to the following standards as applicable:
 - 1. American National Standards Institute (ANSI)/Institute of Electrical and Electronic Engineers (IEEE):
 - a. ANSI B1.20.1 – Pipe Threads, General Purpose.
 - b. ANSI C80.1 – Electrical Rigid Steel Conduit.
 - c. ANSI C80.3 – Steel Electrical Metallic Tubing.
 - d. ANSI FB 1 – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable.
 - 2. National Electrical Contractors Association (NECA):
 - a. NECA 1 – Standard for Good Workmanship in Electrical Construction.
 - 3. National Electrical Manufacturer's Association (NEMA):
 - a. NEMA FB 2.40 – Installation Guidelines for Expansion and Expansion/Deflection Fittings.
 - b. NEMA RN 1 – PVC Externally Coated Galvanized Rigid Steel Conduit.
 - c. NEMA RV-3 – Application and Installation Guidelines for Flexible and Liquid-tight Flexible Metal and Nonmetallic Conduits.

SECTION 16111 – CONDUIT

- d. NEMA TC-2 – Electrical PVC Conduit.
- e. NEMA TC-3 – PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- 4. National Fire Protection Association (NFPA):
 - a. NFPA 70 – National Electrical Code (NEC).
- 5. Underwriters Laboratories (UL):
 - a. UL 1 – Standard for Flexible Metal Conduit.
 - b. UL 6 – Electrical Rigid Metal Conduit-Steel.
 - c. UL 6A – Electrical Rigid Metal Conduit-Aluminum, Red Brass, and Stainless Steel.
 - d. UL 360 – Standard for Liquid-tight Flexible Metal Conduit.
 - e. UL 467 – Grounding and Bonding Equipment.
 - f. UL 514B – Conduit, Tubing, and Cable Fittings.
 - g. UL 651 – Standard for Schedule 40 and 80 Conduit and Fittings.
 - h. UL 1479 – Standard for Fire Tests of Penetration Fire Stops.
- 6. Others:
 - a. American Concrete Institute (ACI): ACI 318-19 – Building Code Requirements for Structural Concrete.
 - b. Aluminum Association – Aluminum and It's Alloys.

1.03 SUBMITTALS

- A. In accordance with the procedures and requirements set forth in the General Conditions and Section 01300 – Record Drawings and Submittals, the Contractor shall obtain from the equipment manufacturer and submit the following:
 - 1. Shop Drawings
- B. Each submittal shall be identified by the applicable Specification Section.

SECTION 16111 – CONDUIT

1.04 SHOP DRAWINGS

- A. Each submittal shall be complete in all respects, incorporating all information and data listed herein and all additional information required for evaluation of the proposed equipment's compliance with the Contract Documents.
- B. Partial, incomplete, or illegible submittals will be returned to the Contractor without review for resubmittal.
- C. Shop drawings shall include but not be limited to:
 - 1. Product data sheets for conduits and fittings.
 - 2. Conduit identification methods and materials.
 - 3. Evidence of training for all personnel that will install PVC coated rigid metal conduit.

1.05 DEFINITIONS

- A. Conduits are categorized by the circuit type of the wiring to be installed inside. Conduits are defined as follows:
 - 1. Power Conduits – Conduits that carry AC or DC power wiring from a source to a load. Conduits that carry lighting and receptacle wiring.
 - 2. Control Conduits – Conduits that carry AC or DC discrete control wiring between devices and/or equipment. Also, conduits that carry fiber optic cables between devices and/or equipment.
 - 3. Instrumentation Conduits – Conduits that carry AC or DC analog signal wiring between devices and/or equipment. Conduits that carry Category 5e or Category 6 unshielded twisted-pair cables.
- B. Conduit categories are indicated on the Drawings by the leading letter of the conduit tag. Conduit tag leading letters are defined as follows:
 - 1. P – Power Conduit
 - 2. C – Control Conduit
 - 3. I – Instrumentation Conduit

SECTION 16111 – CONDUIT

PART 2 – PRODUCTS

2.01 GENERAL

- A. Conduit and conduit fitting products are specified in the text that follows this article. Reference Part 3 herein for the application, uses, and installation requirements of these conduits and conduit fittings.
- B. All metallic conduit fittings shall be UL 514B and UL 467 Listed and constructed in accordance with ANSI FB 1.. All non-metallic fittings shall be UL 651 Listed and constructed in accordance with NEMA TC-3.
- C. Flexible conduit couplings for use in Class I, Division 1 hazardous areas shall have threaded stainless steel end fittings and a flexible braided core. Flexible braid shall be constructed of stainless steel where available in the conduit trade size required for the application. Where stainless steel braid is not available, the braid shall be provided with a PVC coating. No other braid types or materials are acceptable.
- D. Where threading is specified herein for conduit fitting connections, the fittings shall be manufactured to accept conduit that is threaded to ANSI B1.20.1 requirements.
- E. Conduit expansion fittings for all conduit materials of construction shall be capable of 4 inches of movement along the axis of the conduit for trade sizes 2 inches or less. Expansion fittings shall be capable of 8 inches of movement along the axis of the conduit for trade sizes greater than 2 inches.
- F. Conduit deflection fittings for all conduit materials of construction shall be provided with a flexible neoprene outer jacket that permits up to $\frac{3}{4}$ inch of expansion/contraction along the axis of the conduit as well as up to $\frac{3}{4}$ inch of parallel misalignment between the conduit axes. Outer jacket shall be secured to the conduit hubs by stainless steel clamps.
- G. Conduit seals shall either be Listed and Labeled for 40% fill, or conduit reducing fittings and a trade size larger conduit seal shall be provided to achieve 25% or less fill within the seal. Percentage fill calculation shall be based on the conductors to be installed. Conduit seals shall be provided with breathers and/or drains where required by the NEC.
- H. Conduit insulating bushings shall be constructed of plastic and shall have internal threading.
- I. Additional conduit and conduit fitting requirements are specified in the articles that follow based on the specific conduit material of construction to be used.

2.02 RIGID GALVANIZED STEEL (RGS) CONDUIT AND ASSOCIATED FITTINGS

- A. Conduit

SECTION 16111 – CONDUIT

1. Conduit shall be hot dip galvanized on the inside and outside and made of heavy wall high strength ductile steel. Conduit shall be manufactured in accordance with ANSI C80.1 and shall be UL 6 Listed.
2. Conduit shall be provided with factory-cut 3/4 inch per foot tapered threads at each end in accordance with ANSI B1.20.1. Threads shall be cut prior to galvanizing to ensure corrosion protection adequately protects the threads. Conduit shall be provided with a matching coupling on one end and a color-coded thread protector on the other.

B. Conduit Bodies for use with Rigid Galvanized Steel

1. Conduit bodies shall be constructed of an electro-galvanized malleable iron alloy which is coated with an acrylic paint finish. Conduit bodies shall have integral threaded conduit hubs.
2. Conduit bodies for Class I, Division 1 hazardous areas shall be provided with integrally threaded covers constructed of an electro-galvanized malleable iron alloy which is coated with an acrylic paint finish.
3. Conduit bodies for all other areas shall be provided with covers that are affixed in place by stainless steel screws which thread directly into the conduit body. Covers that utilize wedge nuts or any other method of attachment to the conduit body are not acceptable. Covers shall be constructed of an electro-galvanized malleable iron alloy which is coated with an acrylic paint finish. Covers shall be provided with matching gasket.

C. Conduit Couplings, Nipples, and Unions for use with Rigid Galvanized Steel

1. Couplings and nipples shall be threaded and shall be constructed of hot dipped galvanized steel. Split-type couplings that use compression to connect conduits are not acceptable.
2. Unions shall be threaded, rain-tight, and constructed of an electro-galvanized malleable iron alloy which is coated with an acrylic paint finish.

D. Conduit Expansion and Deflection Fittings for use with Rigid Galvanized Steel

1. Conduit expansion fittings and conduit deflection fittings shall be constructed of bronze or an electro-galvanized malleable iron alloy. Expansion and deflection fittings shall have threaded conduit connections.
2. Expansion fittings shall have an integral bonding jumper and deflection fittings shall have an external bonding jumper.

E. Conduit Seals for use with Rigid Galvanized Steel

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1. Conduit seals shall be constructed of an electro-galvanized malleable iron alloy which is coated with an acrylic paint finish. Conduit seals shall have threaded conduit connections.

F. Conduit Termination Fittings for use with Rigid Galvanized Steel

1. Conduit hubs shall be constructed of stainless steel and shall have threaded connections to the conduit and enclosure. Hubs shall have a plastic insulated throat and shall be watertight when assembled to an enclosure.
2. Conduit locknuts shall be constructed of zinc plated steel. Locknuts shall have internal threading. Locknuts with integral gasket or seal are not acceptable. Locknuts shall have integral bonding screw where required for proper bonding.
3. Conduit bonding bushings shall be constructed of zinc plated malleable iron. Bonding bushings shall have a threaded conduit connection. Bonding bushing shall be provided with properly sized set screw for connecting bonding conductor and an integral plastic insulator rated for 150 degrees C located in the throat.

2.03 RIGID NONMETALLIC CONDUIT AND ASSOCIATED FITTINGS

A. Conduit

1. Conduit shall be Schedule 40 or 80 (dependent on application) polyvinyl chloride (PVC) construction, manufactured in accordance with NEMA TC-2, UL 651 Listed, and suitable for conductors with 90 degree C insulation.

B. Conduit Bodies for use with Rigid Nonmetallic Conduit

1. Conduit bodies shall be constructed of PVC. Conduit hubs shall be integral to the conduit body and shall be smooth inside to accept a glued conduit connection.
2. Conduit body shall be provided with cover that is affixed in place by stainless steel screws which thread directly into the conduit body. Covers that utilize wedge nuts or any other method of attachment to the conduit body are not acceptable. Covers shall be provided with matching gasket.

C. Conduit Couplings and Unions for use with Rigid Nonmetallic Conduit

1. Conduit couplings and unions shall be constructed of PVC and shall be smooth inside to accept a glued conduit connection.

D. Conduit Expansion and Deflection Fittings for use with Rigid Nonmetallic Conduit

1. Conduit expansion fittings and conduit deflection fittings shall be constructed of PVC and shall be smooth inside to accept a glued conduit connection.

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E. Conduit Termination Fittings for use with Rigid Nonmetallic Conduit

1. Conduit hubs shall be constructed of PVC and shall be smooth inside to accept a glued conduit connection. Hubs shall have external threads and an accompanying PVC locknut, and shall be watertight when assembled to an enclosure.
2. Conduit locknuts shall be constructed of zinc plated steel. Locknuts shall have internal threading. Locknuts constructed of PVC and locknuts with integral gasket or seal are not acceptable.
3. Conduit end bells shall be constructed of PVC and shall be smooth inside to accept a glued conduit connection. End bell shall have a smooth inner surface that curves outward towards the edge of the fitting.

2.04 PVC COATED RIGID GALVANIZED STEEL CONDUIT AND ASSOCIATED FITTINGS

A. General

1. Where an external coating of polyvinyl chloride (PVC) is specified for conduit and fittings, the coating shall be 40 mil (minimum) thickness. Where an internal coating of urethane is specified for conduit and fittings, the coating shall be 2 mil (minimum) thickness.
2. All conduit fittings shall have a sealing sleeve constructed of PVC which covers all connections to conduit. Sleeves shall be appropriately sized so that no conduit threads will be exposed after assembly.

B. Conduit

1. Conduit shall be hot dip galvanized on the inside and outside and made of heavy wall high strength ductile steel. Conduit shall be manufactured in accordance with ANSI C80.1 and shall be UL 6 Listed.
2. Conduit shall be provided with factory-cut 3/4 inch per foot tapered threads at each end in accordance with ANSI B1.20.1. Threads shall be cut prior to galvanizing to ensure corrosion protection adequately protects the threads. Conduit shall be provided with a matching coupling on one end and a color-coded thread protector on the other.
3. Conduit shall be coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane. Conduit shall be manufactured in accordance with NEMA RN 1.

C. Conduit Bodies for use with PVC Coated Rigid Galvanized Steel Conduit

SECTION 16111 – CONDUIT

1. Conduit bodies shall be constructed of an electro-galvanized malleable iron alloy which is coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane. Conduit bodies shall have integral threaded conduit hubs.
 2. Conduit bodies for Class I, Division 1 hazardous areas shall be provided with integrally threaded covers constructed of an electro-galvanized malleable iron alloy which is coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane.
 3. Conduit bodies for all other areas shall be constructed of an electro-galvanized malleable iron alloy which is coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane. Covers shall be affixed in place by stainless steel screws which thread directly into the conduit body and have a plastic encapsulated head. Covers that utilize wedge nuts or any other method of attachment to the conduit body are not acceptable. Covers shall be provided with matching gasket.
- D. Conduit Couplings, Nipples, and Unions for use with PVC Coated Rigid Galvanized Steel Conduit
1. Couplings and nipples shall be threaded and shall be constructed of hot dipped galvanized steel which is coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane. Split-type couplings that use compression to connect conduits are not acceptable.
 2. Unions shall be threaded, rain-tight, and constructed of an electro-galvanized malleable iron alloy which is coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane.
- E. Conduit Expansion and Deflection Fittings for use with PVC Coated Rigid Galvanized Steel Conduit
1. Conduit expansion fittings and conduit deflection fittings shall be constructed of bronze or an electro-galvanized malleable iron alloy which is coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane. Expansion and deflection fittings shall have threaded conduit connections.
 2. Expansion fittings shall have an integral bonding jumper and deflection fittings shall have an external bonding jumper.
- F. Conduit Seals for use with PVC Coated Rigid Galvanized Steel Conduit
1. Conduit seals shall be constructed of an electro-galvanized malleable iron alloy which is coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane. Conduit seals shall have threaded conduit connections.

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G. Conduit Termination Fittings for Use with PVC Coated Rigid Galvanized Steel Conduit

1. Conduit hubs shall be constructed of an electro-galvanized malleable iron alloy which is coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane. Hubs shall have threaded connections to the conduit and enclosure. Hubs shall have a plastic insulated throat and shall be watertight when assembled to an enclosure.
2. Conduit bonding bushings shall be constructed of zinc plated malleable iron which is coated on the exterior with a PVC jacket and coated on the interior with a layer of urethane. Bonding bushings shall have a threaded conduit connection. Bonding bushing shall be provided with properly sized set screw for connecting bonding conductor and an integral plastic insulator rated for 150 degrees C located in the throat.

2.05 LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC) AND ASSOCIATED FITTINGS

A. Conduit

1. Conduit shall be manufactured using a single strip of hot dip galvanized high strength steel alloy, helically formed into a continuously interlocked flexible metal conduit. Trade size 1-1/4 inch and smaller conduits shall be provided with an integrally woven copper bonding strip.
2. Conduit shall be covered with an outside PVC jacket that is UV resistant, moisture-proof, and oil-proof. Conduit shall be UL 360 Listed. Conduits shall be Listed for and marked with maximum temperature ratings as follows:
 - a. 105 degrees C dry, 60 degrees C wet for all conduit installed against or within 2 inches of equipment capable of having a surface temperature of 80 degrees C or greater (e.g., blowers, incinerators, etc.)
 - b. 80 degrees C dry, 60 degrees C wet for all other locations

B. Conduit Termination Fittings for use with LFMC

1. Conduit termination fittings shall be constructed of either 304 stainless steel or an electro-galvanized malleable iron alloy which is coated on the exterior with a 40 mil (minimum) PVC jacket and coated on the interior with a 2 mil (minimum) layer of urethane. PVC coated fittings shall have a sealing sleeve constructed of PVC which covers the connection to conduit.
2. Termination fittings shall have a threaded end with matching locknut and sealing ring for termination to equipment and shall have an integral external bonding lug where required for proper bonding. Termination fittings shall have a plastic

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insulated throat and shall be watertight when assembled to the conduit and equipment.

2.06 CONDUIT BENDS

A. Rigid conduit bends, both factory-fabricated and field-fabricated, shall meet the same requirements listed in the articles above for the respective conduit type and material of construction.

B. Conduit bend radii for standard radius bends shall be no less than as follows:

Trade Size (inches)	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4	5	6
Min. Radius (inches)	4-1/2	5-3/4	7-1/4	8-1/4	9-1/2	10-1/2	13	15	16	24	30

C. Conduit bend radii for long radius bends shall be no less than as follows:

Trade Size (inches)	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4	5	6
Min. Radius (inches)	N/A	12	18	24	30	30	36	36	48	48	60

2.07 MISCELLANEOUS

A. Conduit Periphery Sealing

1. The sealing of the exterior surface of conduits to prevent water and/or air from passing around the conduit periphery from one space to another (where required) shall be through the use of one of the following:
 - a. A conduit sleeve and pressure bushing sealing system. Acceptable products are FSK by OZ-GEDNEY, Link-Seal by Crouse-Hinds, or Engineer approved equal.
 - b. A conduit sleeve that is two trade sizes larger than the conduit being sealed, with 2-hour fire rated UL 1479 Listed caulk filling the entire void between the conduit and sleeve. This method is only suitable for penetrations in non-fire rated walls and floors between spaces within buildings. This method shall not be used for the sealing of conduits leaving a building and/or structure.
2. Conduit penetrations through fire-rated walls and floors shall be made with an approved UL 1479 Listed product specifically intended for the trade size of the conduit.

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B. Primer and Cement

1. Nonmetallic conduit shall be cleaned with primer and connected to fittings with the manufacturer's recommended cement that is labeled Low VOC.

C. Galvanizing Compounds

1. Galvanizing compounds for field application shall be the cold-applied type, containing no less than 93% pure zinc.

D. Conduit Interior Sealing

1. For all conduits that have cables inside, the sealing of the inside of the conduits against water ingress shall be achieved through the use of one of the following:
 - a. Two-part expanding polyurethane foam sealing compound, dispensed from a single tube which mixes the two parts as it is injected into the conduit. Expanding foam shall be compatible with the conduit material of construction as well as the outer jacket of the cables in the conduit. Acceptable products are Q-Pak 2000 by Chemque, FST by American Polywater Corporation, or Hydra-seal S-60 by Duraline.
 - b. Inflatable bag that provides seal around cables and around inside diameter of conduit. Provide appropriate quantity of additional fittings for applications with three or more cables in the conduit to be sealed. Acceptable products are Rayflate by Raychem, or Engineer approved equal. This sealing method is only applicable to conduits trade size 2 inch and larger.
 - c. Neoprene sealing ring provided with the required quantity and diameter of holes to accommodate the cables in each conduit. Sealing ring shall be compressed by two stainless steel pressure plates. Acceptable products are type CSB by OZ-GEDNEY, or Engineer approved equal. This sealing method is only applicable to metallic conduits containing 4 or less cables.
2. The use of aerosol-based expanding foam sealants or any other method of sealing against water ingress not listed above is not acceptable.
3. For conduits identified as spares, the sealing of the inside of the conduit against water ingress shall be achieved by using appropriately sized rubber expanding-style conduit plugs. Plugs that are held in place only by friction are not acceptable.

E. Pull Rope

1. Pull ropes for empty and/or spare conduits shall be woven polyester, ½-inch wide, with a minimum tensile strength of 1250 lbs.

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2. Pull ropes for the Contractors use in installing conductors shall be the size and strength required for the pull and shall be made of a non-metallic material.

PART 3 – EXECUTION

3.01 GENERAL

- A. All conduit and associated fittings and appurtenances shall be installed in accordance with NECA 1.
- B. Minimum trade size for all rigid conduits shall be 3/4 inch in exposed applications and 1 inch in embedded applications. Conduits installed within ductbanks shall be allowed to be increased in size to trade size 2 inch, at the Contractor's option, to accommodate the saddle size of the ductbank spacers. However, no combining of circuits shall be allowed in the larger conduits.
- C. Minimum trade size for flexible conduits (where specifically allowed herein) shall be 1/2 inch in all applications.
- D. Conduit routing and/or homeruns are shown on the Drawings. The line type used on the Drawings indicates which conduits shall be installed concealed and which shall be installed exposed.
- E. Empty and/or spare conduits shall be provided with pull ropes which have no less than 12 inches of slack at each end.
- F. Nonmetallic conduits for installations requiring less than a factory length of conduit shall be field cut to the required length. The cut shall be made square, cleaned of debris, and primer shall be applied to ready each joint for fusing. Conduits shall then be fused together with the conduit manufacturer's approved cement compound.
- G. Metallic conduits for installations requiring less than a factory length of conduit shall be field cut to the required length. The cut shall be made square, be cleaned of all debris and be de-burred, then threaded. Conduit threading performed in the field shall be 3/4 inch per foot tapered threads in accordance with ANSI B1.20.1.
- H. Conduits shall be protected from moisture, corrosion, and physical damage during construction. Install dust-tight and water-tight conduit fittings on the ends of all conduits immediately after installation and do not remove until conductors are installed.
- I. Conduits shall be installed to provide no less than 12 inches clearance from pipes that have the potential to impart heat upon the conduit. Such pipes include, but are not limited to, hot water pipes, steam pipes, exhaust pipes, and blower air pipes. Clearance shall be maintained whether conduit is installed in parallel or in crossing of pipes.

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- J. Where non-metallic instrumentation conduits are installed exposed, the following clearances to other conduit types shall be maintained:
1. Instrumentation conduits installed parallel to conduits with conductors energized at 480V or above shall be 18 inches.
 2. Instrumentation conduits installed parallel to conduits with conductors energized at 240V and below shall be 12 inches.
 3. Instrumentation conduits installed at right angles to conductors energized at 480V and below shall be 6 inches.
 4. Instrumentation conduits installed at right angles to conductors energized at voltages above 480V shall be 12 inches.
- K. Where conduit fittings do not include an integral insulated bushing, an insulated bushing shall be installed at all conduit termination points.
- L. Conduits which serve multi-section equipment shall be terminated in the section where wiring terminations will be made.
- M. Conduits that terminate at roof mounted equipment shall be installed through the roof curb for the associated equipment to avoid additional roof penetrations wherever possible. Conduits that are installed horizontally on roof surfaces shall be supported by roof blocks that do not impact the roof manufacturer's warranty and shall be installed at least 7/8 inch above the roof surface to avoid the need to further de-rate the conductors inside.
- N. In no case shall conduit be supported or fastened to another pipe or be installed in a manner that would prevent the removal of other pipes for repairs. Spring steel fasteners may only be used to affix conduits containing lighting branch circuits within EMT conduits to structural steel members.
- O. All field fabricated threads for rigid galvanized steel conduit shall be thoroughly coated with two coats of galvanizing compound, allowing at least two minutes to elapse between coats for proper drying.
- P. The appropriate specialized tools shall be used for the installation of PVC coated conduit and conduit fittings. No damage to the PVC coating shall occur during installation. Conduit and conduit fittings with damaged PVC coating shall be replaced at the Contractor's cost. The use of PVC coating touch-up compounds is not permitted.
- Q. Conduits which emerge from within or below concrete encasement shall be PVC coated rigid galvanized steel in accordance with Standard Detail E-26-0102 where the conduit is not protected by an equipment enclosure that surrounds the conduit on all sides at the point where it emerges from the encasement.

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3.02 CONCEALED AND EMBEDDED CONDUITS

- A. Conduits are permitted to be installed concealed and/or embedded with the following requirements:
1. Conduits shall not be installed horizontally when concealed within CMU walls, only vertical installation is acceptable.
 2. Conduits installed embedded within concrete floors or walls shall be located so as not to affect the designed structural strength of the floor or wall.
 3. Where conduit bends emerge from concrete embedment, none of the curved portion of the bend shall be visible. Only the straight portion of the bend shall be visible. The straight portion shall emerge perpendicular to the embedment (i.e., neatly oriented 90-degrees to floor/slab/grade). Conduits that emerge in a non-perpendicular orientation are not acceptable.
 4. Where multiple conduits emerge from concrete embedment or from concealment below a concrete floor, ample clear space shall be provided between conduits to allow for the appropriate and required conduit termination fittings to be installed.
 5. Conduits installed embedded within concrete encasement of any kind shall be installed such that conduit couplings for parallel conduits are staggered so that they are not side by side.
- B. Conduits are NOT permitted to be installed concealed and/or embedded for the following situations:
1. Conduits shall not be installed embedded within any water-bearing floors or walls. Conduits shall not be installed embedded within any liquid containment area floors or walls.
 2. Conduits shall not be installed concealed within CMU walls or gypsum walls that are adjacent to Class I and II hazardous areas (Division 1 and Division 2).
 3. Conduits shall not be installed concealed within CMU walls or gypsum walls that are adjacent to indoor Type 1 or Type 2 chemical storage/transfer areas.

3.03 CONDUIT USES AND APPLICATIONS

- A. Rigid Conduit
1. Rigid conduit for non-hazardous areas shall be furnished and installed in the materials of construction as follows:

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Rigid Conduit for Non-Hazardous Areas

Installation Area Designation / Scenario	Conduit Category by Wiring / Circuit Type	
	Power and Control	Instrumentation
Exposed in indoor wet process areas	PVC coated rigid galvanized steel conduit	Same as Power and Control
Exposed in outdoor areas	PVC coated rigid galvanized steel conduit	Same as Power and Control
Concealed within underground direct-bury or concrete-encased ductbanks	Schedule 40 rigid non-metallic PVC conduit	Rigid galvanized steel conduit
Emerging from concealment within or below a concrete floor and transitioning to exposed conduit (Reference Detail E-26-0102)	PVC coated rigid galvanized steel conduit	Same as Power and Control

2. The tables for the materials of construction for rigid conduits are intended to exhaustively cover all possible scenarios and installation areas under this Contract. However, if a scenario or installation area is found that is not explicitly governed by these tables, it shall be assumed for bid purposes that the conduit material of construction is to be rigid galvanized steel. This discrepancy shall be brought to the attention of the Engineer (in writing) immediately for resolution.

B. Conduit Bends

1. All conduit bends shall be the same material of construction as the rigid conduit listed in the tables above, with the following exceptions:
 - a. All 90-degree bends or combinations of adjacent bends that form a 90-degree bend where concealed within concrete or below a concrete slab shall be rigid galvanized steel.
2. Field fabricated bends of metallic conduit shall be made with a bending machine and shall have no kinks. Field fabricated standard radius and long radius bends shall have minimum bending radii in accordance with the associated tables in Part 2 herein.
3. Field bending of non-metallic conduits is not acceptable, factory fabricated bends shall be used.

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4. Long radius bends shall be furnished and installed for the following specific applications, all other bends shall be standard radius:
 - a. All conduits containing medium voltage cable.
 - b. All conduits containing fiber optic cable.
 - c. All conduits containing shielded VFD cable.
 - d. Where specifically indicated on the Drawings.

C. Flexible Conduit

1. Flexible conduit shall only be installed for the limited applications specified herein. Flexible conduit shall not be installed in any other application without written authorization from the Engineer. Acceptable applications are as follows:
 - a. Connections to motors and engine-generator sets (and similar vibrating equipment)
 - b. Connections to solenoid valves and limit switches
 - c. Connections to lighting fixtures installed in suspended ceilings
 - d. Connections to lighting transformers and combination power units
 - e. Connections to pre-fabricated equipment skids
 - f. Connections to HVAC equipment
 - g. Connections to instrument transmitters and elements
 - h. Where specifically indicated in the Standard Details
2. Flexible conduit length shall be limited to three (3) feet, maximum. Flexible conduit shall not be installed buried or embedded within any material.
3. Unless otherwise specified herein, flexible conduits shall be installed in accordance with the Installation Guidelines published within NEMA RV-3.
4. Flexible conduit for non-hazardous areas shall be furnished and installed in the materials of construction as follows:

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Flexible Conduit for Non-Hazardous Areas

Installation Area Designation / Scenario	Conduit Category by Wiring / Circuit Type	
	Power and Control	Instrumentation
Exposed in indoor wet process areas	Liquid-tight flexible metal conduit	Same as Power and Control
Exposed in outdoor areas	Liquid-tight flexible metal conduit	Same as Power and Control

3.04 CONDUIT FITTING USES AND APPLICATIONS

A. General

1. Conduit fittings shall be furnished and installed in the materials of construction as indicated in Part 2, herein. Conduit fitting materials of construction are dependent on the material of construction used for the associated conduit.
2. Conduit fittings shall be provided in the trade size and configuration required to suit the application.

B. Conduit Bodies

1. Conduit bodies shall be installed where wire pulling points are desired or required, or where changes in conduit direction or breaking around beams is required.
2. Where conduit bodies larger than trade size 2 inches are intended to be used as a pull-through fitting during wire installation, oversized or elongated conduit bodies shall be used. Oversized or elongated conduit bodies shall not be required if the conduit body is intended to be used as a pull-out point during wire installation.

C. Conduit Nipples and Unions

1. Conduits with running threads shall not be used in place of 3-piece couplings (unions) or close nipples. After installation of a conduit fitting of any kind, there shall be no more than ¼ inch of exposed threads visible. Factory fabricated all-thread nipples may be used between adjacent enclosures, however, the same restriction applies regarding the length of exposed threads that are visible.

D. Conduit Expansion and Deflection Fittings

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1. Conduit expansion fittings shall be installed where required by the NEC and where indicated on the Drawings. Expansion fittings shall also be installed for exposed straight metallic conduit runs of more than 75 feet, in both indoor and outdoor locations. Expansion fittings for runs of non-metallic conduit shall be installed in accordance with the NEC.
2. Conduit deflection fittings shall be installed where required by the NEC and where conduits are installed (exposed and concealed) across structural expansion joints.
3. Unless otherwise specified herein, conduit expansion and deflection fittings shall be installed in accordance with the Installation Guidelines published within NEMA FB 2.40.

E. Conduit Seals

1. Conduit seals shall be installed for conduits installed within or associated with hazardous areas and other areas as required by the NEC. In addition, conduit seals shall also be furnished and installed as follows:
 - a. All conduits entering or leaving enclosed areas which store or distribute chlorine gas.
 - b. All conduits entering or leaving enclosed areas which store or distribute sulfur dioxide gas.

F. Conduit Termination Fittings

1. Where conduits terminate at enclosures with a NEMA 4, 4X, or 3R rating and the enclosure does not have integral conduit hubs, an appropriately sized watertight conduit hub shall be installed to maintain the integrity of the enclosure. The use of locknuts with integral gasket in lieu of watertight conduit hubs is not acceptable.
2. Where conduits terminate at enclosures that do not require conduit hubs, a two-locknut system shall be used to secure the conduit to the enclosure. One locknut shall be installed on the outside of the enclosure, and the other inside, drawn tight against the enclosure wall. The locknut on the interior of the enclosure shall be the type with integral bonding lug, or a conduit bonding bushing may be used in place of the interior locknut.
3. Conduits shall not be installed such that conduit fittings penetrate the top of any enclosure located outdoors, except in cases where specifically required by the serving electric utility. Conduits which serve outdoor equipment or an enclosure from above shall instead be routed into the side of the enclosure at the bottom. The conduit termination fitting shall be provided with a conduit drain to divert moisture from the raceway away from the enclosure.

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3.05 MISCELLANEOUS

A. Conduit Periphery Sealing

1. All conduit penetrations through exterior walls shall be sealed around the periphery using the appropriate products specified in Part 2 herein to prevent air and/or water entry into the structure.
2. All conduit penetrations through interior walls and floors shall be sealed through the use of conduit sleeves and caulk as specified in Part 2 herein. Alternatively, mortar may be used to seal around the conduit periphery.
3. Conduit penetrations through fire-rated walls as floors shall be made with the appropriate fire rated penetration product.

B. Conduit Interior Sealing

1. All conduits (including spares) entering a structure below grade shall be sealed on the interior of the conduit against water ingress. Sealing shall be at an accessible location in the conduit system located within the building structure and shall be via one of the methods specified in Part 2 herein. If conduit sealing cannot be achieved at an accessible location within the building structure, sealing shall be placed in the conduits in the nearest manhole or handhole outside the structure.
2. Conduit interior sealing shall not be installed until conductors inside are tested and test results are deemed acceptable by the Engineer. Conduit interior sealing shall be installed prior to energization of the conductors inside.

3.06 CONDUIT IDENTIFICATION

- A. The identification system for the conduits furnished and installed under this Contract shall match the existing identification system used at the project location.

3.07 TESTING

- A. All tests shall be performed in accordance with the requirements of the General Conditions. The following tests are required:
 1. All conduit installed below grade or concrete encased shall be tested to ensure continuity and the absence of obstructions by pulling through each conduit a swab followed by a mandrel 85% of the conduit inside diameter. After testing, all conduits shall be capped after installation of a suitable pulling rope.

SECTION 16111 – CONDUIT

3.08 TRAINING OF INSTALLATION PERSONNEL

- A. All Contractor personnel that install PVC coated RGS conduit shall be trained by the PVC coated RGS conduit manufacturer. Training shall include proper conduit system assembly techniques, use of tools appropriate for coated conduit systems, and field bending/cutting/threading of coated conduit. Training shall have been completed within the past 24 months prior to the Notice to Proceed on this Contract to be considered valid. Contractor personnel not trained within this timeframe shall not be allowed to install coated conduit or shall be trained/re-trained as required prior to commencement of conduit installation.

END OF SECTION

(BLANK)

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

SECTION 16123 LOW VOLTAGE WIRE AND CABLES

PART 1 – GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish, install, connect, test, and place in satisfactory operating condition all low voltage wire and cable indicated on the Drawings, as specified herein, and/or required for proper operation. The work of connecting cables to equipment and devices shall be considered a part of this Section. All appurtenances required for the installation of wire and cable systems shall be furnished and installed by the Contractor.
- B. The scope of this Section does not include internal wiring factory installed by electrical equipment manufacturers.
- C. Reference the following Specification Sections:
 - 1. Section 16000 – Basic Electrical Requirements

1.02 CODES AND STANDARDS

- A. All low voltage wire, cable, and appurtenances shall be Listed by and shall bear the Label of Underwriter's Laboratories, Incorporated (UL).
- B. Low voltage wire, cable, and appurtenances shall be designed, manufactured, and/or Listed to the following standards as applicable:
 - 1. American National Standards Institute (ANSI)/Institute of Electrical and Electronic Engineers (IEEE):
 - a. IEEE 1202 – Standard for Flame Testing of Cables.
 - 2. American Society for Testing and Materials (ASTM):
 - a. ASTM B3 – Standard Specification for Soft or Annealed Copper Wire.
 - b. ASTM B8 – Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
 - c. ASTM B33 – Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes.
 - d. ASTM D69 – Standard Test Methods for Friction Tapes.
 - e. ASTM D4388 – Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes.

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

3. Insulated Cable Engineers Association (ICEA):
 - a. ICEA S-58-679 – Standard for Control, Instrumentation and Thermocouple Extension Conductor Identification.
 - b. ICEA T-29-250 – Conducting Vertical Cable Tray Flame Tests with Theoretical Heat Input Rate of 210,000 B.T.U./Hour.
4. National Fire Protection Association (NFPA):
 - a. NFPA 70 – National Electrical Code (NEC).
5. Underwriters Laboratories (UL):
 - a. UL 13 – Standard for Power-Limited Circuit Cables.
 - b. UL 44 – Thermoset-Insulated Wires and Cables.
 - c. UL 83 – Thermoplastic-Insulated Wires and Cables.
 - d. UL 1277 – Standard for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.
 - e. UL 1581 – Reference Standard for Electrical Wires, Cables, and Flexible Cords.
 - f. UL 1685 – Standard for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables.
 - g. UL 2250 – Standard for Instrumentation Tray Cable.
 - h. UL 2556 – Wire and Cable Test Methods.

1.03 SUBMITTALS

- A. In accordance with the procedures and requirements set forth in the General Conditions and Section 01300 – Record Drawings and Submittals, the Contractor shall obtain from the wire and cable manufacturer and submit the following:
 1. Shop Drawings
 2. Reports of Field Tests
- B. Each submittal shall be identified by the applicable Specification Section.

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

1.04 SHOP DRAWINGS

- A. Each submittal shall be complete in all respects, incorporating all information and data listed herein and all additional information required for evaluation of the proposed material's compliance with the Contract Documents.
- B. Partial, incomplete, or illegible Submittals will be returned to the Contractor without review for resubmittal.
- C. Shop drawings shall include but not be limited to:
 - 1. Product data sheets for the following:
 - a. Wire and cable
 - b. Power and control wire terminations, including wire ferrules
 - c. Instrumentation cable terminations
 - d. Pulling lubricant.
 - 2. Cable pulling calculations (if required).
 - 3. Wiring identification methods and materials.
- D. The shop drawing information shall be complete and organized in such a way that the Engineer can determine if the requirements of these specifications are being met. Copies of technical bulletins, technical data sheets from "soft-cover" catalogs, and similar information which is "highlighted" or somehow identifies the specific equipment items the Contractor intends to provide are acceptable and shall be submitted.

1.05 CABLE PULLING CALCULATIONS

- A. Prior to the installation of the wire and cable specified herein, the Contractor shall submit cable pulling calculations for Engineer review and approval when all of the following are true:
 - 1. The amount of cable to be installed will be greater than 200 linear feet between pull points.
 - 2. The installation will have one or more bends.
 - 3. The wire/cable is size #1/0 AWG and larger.
- B. Cable pulling calculations shall be performed by a Professional Engineer (P.E.) licensed in the State or Commonwealth in which the project is located. Calculations shall define pulling tension and sidewall loading (sidewall bearing pressure values).

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. The wire and cable to be furnished and installed for this project shall be the product of manufacturers who have been in the business of manufacturing wire and cable for a minimum of ten (10) years. Wire and cable shall be designed, constructed, and installed in accordance with the best practices of the trade, and shall operate satisfactorily when installed as specified herein and indicated on the Drawings. Only one (1) manufacturer for each wire and cable type shall be permitted.

2.02 POWER AND CONTROL WIRE AND CABLE

- A. Power and control wire shall consist of insulated copper conductors with a nylon (or equivalent) outer jacket. Conductor insulation shall be rated 90°C for dry locations, 75°C for wet locations, and 600V. Insulated conductors shall be UL 83 Listed as NEC Type THHN/THWN.
- B. Unless specified otherwise herein, conductors shall be stranded copper per ASTM B-8 and B-3, with Class B or C stranding contingent upon the size. Power conductors for lighting and receptacle branch circuits shall be solid copper per ASTM B-3.
- C. Power conductor size shall be no smaller than No. 12 AWG and Control conductor size shall be no smaller than No. 14 AWG.
- D. Multi-conductor cable assemblies shall include a grounding conductor and an overall PVC jacket. The jacket shall be PVC and resistant to abrasion, sunlight, and flame in accordance with UL 1277. Multi-conductor cable assemblies shall be UL 1277 Listed as NEC Type TC (Power and Control Tray Cable).
- E. Power wire and cable shall be as manufactured by the Okonite Company, the Southwire Company, General Cable, Encore Wire, or Engineer approved equal.

2.03 INSTRUMENTATION CABLE

- A. For single-analog signal applications, instrumentation cable shall consist of a single, twisted pair or triad of individually insulated and jacketed copper conductors with an overall cable shield and jacket. Conductor insulation shall be rated 90°C in both wet and dry locations, and 600V. The jacket shall be PVC and resistant to abrasion, sunlight, and flame in accordance with UL 1277. Cable shall be UL 1277 Listed as NEC Type TC (Power and Control Tray Cable).
- B. For multiple-analog signal applications, instrumentation cable shall consist of multiple, twisted pairs or triads (i.e., groups) of individually insulated and jacketed copper conductors with individual pair/triad shields (i.e., group shields) and an overall cable shield and jacket. Conductor insulation shall be rated 90°C in both wet and dry locations, and 600V. The jacket shall be PVC and resistant to abrasion, sunlight, and flame in

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

accordance with UL 1277. Cable shall be UL 1277 Listed as NEC Type TC (Power and Control Tray Cable).

- C. Cable and group shields shall consist of overlapped aluminum/polyester tape/foil providing 100% coverage. Instrumentation cables shall include an overall copper shield drain wire. Cables containing multiple twisted pairs or triads shall also include group shield drain wires.
- D. Conductors, including drain wires, shall be tin or alloy coated (if available), soft, annealed copper, stranded per ASTM B-8, with Class B stranding unless otherwise specified.
- E. Instrumentation signal conductor size shall be no smaller than No. 16 AWG.
- F. Instrumentation cable shall be Okoseal-N Type P-OS (for single pair or triad applications) or Okoseal-N Type SP-OS (for multiple pair or triad applications) as manufactured by the Okonite Company, Belden equivalent, Southwire Company equivalent, or Engineer approved equal.

2.04 CONDUCTOR IDENTIFICATION

- A. Conductors shall be identified using a color-coding method. Color coding for individual power, control, lighting, and receptacle conductors shall be as follows:
 - 1. 480/277V AC Power
 - a. Phase A – BROWN
 - b. Phase B – ORANGE
 - c. Phase C – YELLOW
 - d. Neutral – GREY
 - 2. 120/208V or 120/240V AC Power
 - a. Phase A – BLACK
 - b. Phase B – RED
 - c. Phase C – BLUE
 - d. Neutral – WHITE
 - 3. DC Power
 - a. Positive Lead – RED

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

- b. Negative Lead - BLACK
 - 4. DC Control
 - a. All wiring – BLUE
 - 5. 120 VAC Control
 - a. 120 VAC control wire shall be RED except for a wire entering a motor control center compartment, motor controller, or control panel which is an interlock. This interlock conductor shall be color coded YELLOW. For the purposes of this Section, an interlock is defined as any wiring that brings voltage into the above-mentioned equipment from a source outside that equipment.
 - 6. 24 VAC Control
 - a. All wiring - ORANGE
 - 7. Equipment Grounding Conductor
 - a. All wiring - GREEN
- B. Individual conductors No. 2 AWG and smaller shall have factory color coded insulation. It is acceptable for individual conductors larger than No.2 AWG to be provided with factory color coded insulation as well, but it is not required. Individual conductors larger than No.2 AWG that are not provided with factory color coded insulation shall be identified by the use of colored tape in accordance with the requirements listed in Part 3 herein. Insulation colors and tape colors shall be in accordance with the color-coding requirements listed above.
- C. Conductors that are part of multi-conductor cable assemblies shall have black insulation. The conductor number shall be printed on each conductor's insulation in accordance with ICEA S-58-679, Method 4. Each conductor No.2 AWG and smaller within the cable assembly shall also be identified with a heat shrink tag with color coded background. Each conductor larger than No.2 AWG within the cable assembly shall also be identified by the use of colored tape. Heat shrink tags and colored tape shall be in accordance with the requirements listed in Part 3 herein. Tape color and heat shrink tag background color shall be in accordance with the color-coding requirements listed above.

2.05 CABLE PULLING LUBRICANTS

- A. Cable pulling lubricants shall be non-hardening type and approved for use on the type of cable installed. Lubricant shall be Yellow #77 Plus by Ideal, Cable Gel by Greenlee, Poly-Gel by Gardner Bender, or equal.

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

PART 3 – EXECUTION

3.01 WIRE AND CABLE INSTALLATION

A. General

1. All wire and cable furnished under this Contract, including wire and cable furnished under other Divisions, shall be installed in raceways (e.g., conduit) unless specifically noted otherwise.
2. Wire and cable shall be installed as specified herein and indicated on the Drawings. Unless specifically indicated otherwise on the Drawings, wire and cable shall be installed in separate raceways according to wiring type. For example, power wiring shall not be combined with control wiring, and control wiring shall not be combined with instrumentation wiring.
3. Wire shall be furnished and installed as single conductor cables, with limited exceptions. Multi-conductor cable assemblies shall only be installed where indicated on the Drawings, required by the NEC, or after obtaining written permission from the Engineer.
4. Where instrumentation cables are installed in control panels, motor controllers, and other locations, the Contractor shall arrange wiring to provide maximum clearance between these cables and other conductors. Instrumentation cables shall not be installed in same bundle with conductors of other circuits.
5. Instrumentation cable shielding shall be continuous and shall be grounded at one point only.

B. Splices

1. Splices shall not be allowed in power or control wire and cable unless approved in writing by the Engineer. If unique field conditions exist or pulling calculations indicate that splices may be required, the Contractor shall submit a detailed request indicating why splices are required to the Engineer. The Engineer shall be under no obligation to grant such request.
2. Splicing materials shall be UL 486A Listed barrel type butt splice connectors and heat shrink tubing as manufactured by 3M, Ideal, or equal. The use of screw-on wire connectors (wire nuts) shall only be permitted for lighting and receptacle circuits.
3. No splicing of instrumentation cable is permitted.

C. Wire and Cable Sizes

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

1. The sizes of wire and cable shall be as indicated on the Drawings, or if not shown, as approved by the Engineer. If required due to field routing, the size of conductors and respective conduit shall be increased so that the voltage drop measured from source to load does not exceed 2-1/2%.

D. Additional Conductor Identification

1. In addition to the color-coding identification requirements specified in Part 2 herein, individual conductors shall be provided with heat shrinkable identification tags. Identification tags for individual conductors shall have a white background where the conductor insulation is colored. Identification tags for individual conductors shall have a colored background where the conductor insulation is black. Background color shall match that of the taping provided on the individual black conductors.
2. Multi-conductor cables shall be provided with heat shrinkable identification tags in accordance with Part 2 herein.
3. All wiring shall be identified at each point of termination. This includes but is not limited to identification at the source, load, and in any intermediate junction boxes where a termination is made. The Contractor shall meet with the Owner and Engineer to come to an agreement regarding a wire identification system prior to installation of any wiring. Wire numbers shall not be duplicated.
4. Wire identification shall be by means of a heat shrinkable sleeve with appropriately colored background and black text. Wire sizes #14 AWG through #10 AWG shall have a minimum text size of 7 points. Wire sizes #8 AWG and larger shall have a minimum text size of 10 points. Sleeves shall be of appropriate length to fit the required text. The use of handwritten text for wire identification shall not be permitted.
5. Sleeves shall be suitable for the size of wire on which they are installed. Sleeves shall not be heat-shrunk onto control cables. Tags shall remain loose on cable to promote easier identification. For all other applications, sleeves shall be tightly affixed to the wire and shall not move. Sleeves shall be heat shrunk onto wiring with a heat gun approved for the application. Sleeves shall not be heated by any means which employs the use of an open flame. The Contractor shall take special care to ensure that the wiring insulation is not damaged during the heating process.
6. Sleeves shall be installed prior to the completion of the wiring terminations and shall be oriented so that they can be easily read.
7. Sleeves shall be polyolefin as manufactured by Brady, Seton, Panduit, or equal.
8. Wire identification in manholes, handholes, pull boxes, and other accessible components in the raceway system where the wiring is continuous (no

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

terminations are made) shall be accomplished by means of a tag installed around the bundled group of individual conductors or around the outer conductor jacket of a multi-conductor cable. Identification shall utilize a FROM-TO system. Each group of conductors shall consist of all the individual conductors in a single conduit or duct. The tag shall have text that identifies the bundle in accordance with the 'FROM' and 'TO' column for that specific conduit number in the conduit and wire schedule. Minimum text size shall be 10 point. The tag shall be affixed to the wire bundle using nylon wire ties and shall be made of polyethylene as manufactured by Brady, Seton, Panduit, or equal.

9. Where colored tape is used to identify cables, it shall be wrapped around the cable with a 25% overlap and shall cover at least 2 inches of the cable.

E. Wiring Supplies

1. Rubber insulating tape shall be in accordance with ASTM D4388. Friction tape shall be in accordance with ASTM D69.

F. Training of Cable in Manholes, Handholes, and Vaults

1. The Contractor shall furnish all labor and material required to train cables around cable vaults, manholes, and handholes. Sufficient length of cable shall be provided in each handhole, manhole, and vault so that the cable can be trained and racked in an approved manner. In training or racking, the radius of bend of any cable shall be not less than the manufacturer's recommendation. The training shall be done in such a manner as to minimize chaffing.
2. Instrumentation cable shall be racked and bundled separate from AC wiring to maintain the required separation as follows:
 - a. 18 inches for 480/277 VAC wiring
 - b. 12 inches for 208/120 VAC wiring
 - c. 6 inches for 24 VAC wiring

G. Conductor Terminations

1. Where wires are terminated at equipment which requires lugs, connections shall be made by solderless mechanical lug, crimp type ferrule, or irreversible compression type lugs. Reference individual equipment Specification Sections as applicable for additional termination requirements.
2. For conductors with stranding other than Class B or C, a UL 486A Listed wire ferrule shall be installed prior to each conductor termination. Ferrules shall be suitable for the size of conductors and shall be made of a material that is

SECTION 16123 – LOW VOLTAGE WIRE AND CABLES

compatible with the conductors. Ferrules shall be crimped on in accordance with the ferrule manufacturer's instructions.

3. Where enclosure sizes and sizes of terminals at limit switches, solenoid valves, float switches, pressure switches, temperature switches, and other devices make terminations impractical due to the size of the field wiring, the Contractor shall terminate field wiring in an adjacent junction box, complete with terminal strips. Contractor shall install the smaller wiring from the device to the junction box in a conduit, using the terminal strip as the means for joining the two different wire sizes. Splicing of wires in lieu of using terminal strips is not acceptable.
4. The cables shall be terminated in accordance with the cable and/or termination product manufacturer's instructions for the particular type of cable.
5. All spare conductors shall be terminated on terminal blocks mounted within equipment or junction boxes. Unless otherwise noted, coiling up of spare conductors within enclosure is not acceptable.

H. Pulling Temperature

1. Cable shall not be installed when the temperature of the jacket is such that damage will occur due to low temperature embrittlement. When cable will be pulled with an ambient temperature of 40°F or less within a three (3) day period prior to pulling, the cable reels shall be stored three (3) days prior to pulling in a protected storage area with an ambient temperature of 55°F or more. Cable pulling shall be completed during the workday for which the cable is removed from the protected storage. Any cable reels with wire remaining on them shall be returned to storage at the completion of the workday.

3.02 TESTING

- A. All testing shall be performed in accordance with the requirements of the General Conditions. The following tests are required:
 1. Shop Test
 - a. Wires and cables shall be tested in accordance with the applicable ICEA Standards. Wire and cable shall be physically and electrically tested in accordance with the manufacturer's standards.

END OF SECTION

SECTION 16130 – BOXES

SECTION 16130 BOXES

PART 1 – GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish and install all pull boxes, junction boxes, and outlet boxes as specified herein, indicated on the Drawings, and as required. Requirements for other boxes and enclosures are not necessarily included in this Section. Reference each specific equipment specification section for requirements related to that equipment's respective enclosure.
- B. Reference the following Specification Sections:
 - 1. Section 16000 – Basic Electrical Requirements
 - 2. Section 16111 – Conduit for Electrical Systems
 - 3. Section 16195 – Electrical - Identification

1.02 CODES AND STANDARDS

- A. All boxes shall be Listed by and shall bear the Label of Underwriter's Laboratories, Incorporated (UL).
- B. Boxes shall be designed, manufactured, and/or Listed to the following standards as applicable:
 - 1. National Electrical Manufacturers Association (NEMA):
 - a. NEMA 250 – Enclosures for Electrical Equipment.
 - 2. National Fire Protection Association (NFPA):
 - a. NFPA 70 – National Electrical Code (NEC).
 - 3. Underwriters Laboratories (UL):
 - a. UL 50 – Enclosures for Electrical Equipment, Non-environmental Considerations.
 - b. UL 50E – Enclosures for Electrical Equipment, Environmental Considerations.

SECTION 16130 – BOXES

1.03 SUBMITTALS

- A. In accordance with the procedures and requirements set forth in the General Conditions and Section 01300 – Record Drawings and Submittals, the Contractor shall obtain from the equipment manufacturer(s) and submit the following:
 - 1. Shop Drawings
- B. Each submittal shall be identified by the applicable Specification Section.

1.04 SHOP DRAWINGS

- A. Each submittal shall be complete in all respects, incorporating all information and data listed herein and all additional information required for evaluation of the proposed equipment's compliance with the Contract Documents.
- B. Partial, incomplete, or illegible Submittals will be returned to the Contractor without review for resubmittal.
- C. Shop drawings shall include but not be limited to:
 - 1. Product data sheets for boxes, terminal strips, and all accessories
 - 2. Overall bill of material for all boxes included under this Contract to summarize exactly what is being submitted for review. Bill of material shall at a minimum show each box type (i.e., pull, junction, or outlet), quantity, material of construction, dimensions, and proposed installation location.

1.05 OPERATION AND MAINTENANCE MANUALS

- A. The Contractor shall submit operation and maintenance manuals in accordance with the procedures and requirements set forth in the General Conditions and Division 01.
- B. As-built drawings showing dimensions, internal box layout, terminal strip information, and terminal strip identification information shall be provided for all junction boxes. As-built drawings are not required for pull boxes or outlet boxes.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. The equipment covered by this Specification is intended to be standard equipment of proven performance as manufactured by reputable concerns. Equipment shall be designed, constructed, and installed in accordance with the best practices of the trade, and shall operate satisfactorily when installed as shown on the Drawings.

SECTION 16130 – BOXES

2.02 PULL AND JUNCTION BOXES

A. General

1. All pull and junction boxes shall be UL Listed and Labeled.
2. Pull and junction boxes shall not be provided with eccentric or concentric knockouts.
3. Pull and junction boxes mounted embedded in concrete shall be UL Listed for embedment.
4. Where metallic boxes are used, they shall be of all welded construction. Tack welded boxes are not acceptable.

B. Pull Boxes

1. Metallic pull boxes in non-hazardous locations and in hazardous locations where general-purpose enclosures are permitted (e.g., Class I, Division 2 locations) shall be provided with a matching gasketed cover. For covers with dimensions of less than 12 inches by 12 inches, the cover shall be held in place by stainless steel machine screws. Other screw types are not acceptable. For covers with dimensions 12 inches by 12 inches and larger, the cover shall be hinged and held in place by 1/4-turn style latches. Latch mechanism shall be all stainless steel. Hinge pins shall be removable.
2. Metallic pull boxes in hazardous locations where general-purpose enclosures are not permitted (e.g., Class I, Division 1 locations) shall be provided with a matching gasketed cover. Cover shall be hinged and held in place by stainless steel bolts. Hinge pins shall be removable. Covers shall be installed and bolts torqued in accordance with manufacturer requirements to maintain the hazardous location rating of the enclosure.
3. Non-metallic pull boxes shall be provided with a matching gasketed cover. The cover shall be hinged and held in place by quick-release (e.g., “flip”) latches. Latch material of construction shall match the box material, and include stainless steel hasps. For covers with dimensions 24 inches by 24 inches and larger, a 3-point latching mechanism with external pad-lockable handle may be substituted. Latch mechanism and handle shall be all stainless steel. Hinge pins shall be removable.
4. Pull boxes shall not have any wire terminations inside, other than those for grounding/bonding. A ground bar shall be provided with the necessary number of screw type terminals. Twenty (20) percent of the total amount of terminals otherwise required for the pull box (minimum of two) shall be provided as spare

SECTION 16130 – BOXES

terminations. Boxes requiring any other wire terminations shall be furnished and installed in accordance with the requirements for junction boxes herein.

5. Pull boxes shall be 6 inches wide by 6 inches tall by 4 inches deep, minimum. For applications requiring larger boxes, the box shall be sized in accordance with the fill requirements and dimensional requirements of the NEC.
6. Barriers shall be provided in pull boxes to isolate conductors of different voltages, types, and functions. Barrier material of construction shall match that of the box. Isolation shall be provided between the following groups:
 - a. Power wiring
 - b. AC control wiring
 - c. DC control wiring
 - d. Instrumentation wiring

C. Junction Boxes

1. Metallic junction boxes in non-hazardous locations shall be provided with a matching gasketed cover. For covers with dimensions of less than 12 inches by 12 inches, the cover shall be held in place by stainless steel machine screws. Other screw types are not acceptable. For covers with dimensions 12 inches by 12 inches and larger, the cover shall be hinged and held in place by 1/4-turn style latches. Latch mechanism shall be all stainless steel. Hinge pins shall be removable.
2. Metallic junction boxes in hazardous locations shall be provided with a matching gasketed cover. Cover shall be hinged and held in place by stainless steel bolts. Hinge pins shall be removable. Covers shall be installed and bolts torqued in accordance with manufacturer requirements to maintain the hazardous location rating of the enclosure.
3. Non-metallic junction boxes shall be provided with a matching gasketed cover. The cover shall be hinged and held in place by quick-release (e.g., “flip”) latches. Latch material of construction shall match the box material and include stainless steel hasps. For covers with dimensions 24 inches by 24 inches and larger, a 3-point latching mechanism with external pad-lockable handle may be substituted. Latch mechanism and handle shall be all stainless steel. Hinge pins shall be removable.
4. Barriers shall be provided in junction boxes to isolate conductors and terminal blocks of different voltages, types, and functions. Barrier material of construction

SECTION 16130 – BOXES

shall match that of the box. Isolation shall be provided between the following groups:

- a. Power wiring
 - b. AC control wiring
 - c. DC control wiring
 - d. Instrumentation wiring
5. Junction boxes used for lighting and receptacle circuits only shall be allowed to have screw-on (wire nut) type connectors for wire terminations/junctions.
 6. Junction boxes for all uses other than lighting and receptacle circuits shall be provided with terminal strips, consisting of the necessary number of screw type terminals. Current carrying parts of the terminal blocks shall be of ample capacity to carry the full load current of the circuits connected, with a 10A minimum capacity. Terminal strips shall be rated for the voltage of the circuits connected. A separate ground bar shall be provided with the necessary number of screw type terminals. Twenty (20) percent of the total amount of terminals otherwise required for the junction box (minimum of two) shall be provided as spare terminations. When barriers are provided within the box, separate terminal strips shall be provided in each barrier area. Terminals shall be lettered and/or numbered to conform to the wiring labeling scheme in place on the project.
 7. Junction boxes shall be 6 inches wide by 6 inches tall by 4 inches deep, minimum. For applications requiring larger boxes, the box shall be sized in accordance with the fill requirements and dimensional requirements of the NEC. Terminal blocks (including spare terminals) shall be considered when sizing the junction box.

D. Enclosure Types and Materials

1. In non-hazardous locations, pull and junction boxes shall be furnished with the following enclosure type and material of construction, dependent upon the designation of the area in which they are to be installed. Area designations are indicated on the Drawings.

Area Designation	Enclosure Type and Material
Indoor Wet Process Area	NEMA 4X, Type 304 Stainless Steel
All Outdoor Areas	NEMA 4X, Type 304 Stainless Steel

SECTION 16130 – BOXES

2. Non-metallic enclosures, NEMA 7 enclosures, and NEMA 9 enclosures shall be provided with threaded integral conduit hubs.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Pull and Junction Boxes

1. Pull boxes and junction boxes shall be solidly attached to structural members prior to installation of conduit and set true and plumb. Boxes shall not be supported by their associated conduits.
2. Wooden plugs are not permitted for securing boxes to concrete. Appropriately rated anchors specifically suited for use in concrete shall be used.
3. Box penetrations for conduits shall be made with a punch tool, and penetrations shall be of the size required for the conduit entry and/or hub. Oversized penetrations in boxes are not acceptable.
4. Watertight conduit hubs shall be provided for boxes where a NEMA 4X enclosure rating is specified. Reference Section 16111 – Conduit for conduit hub requirements.
5. Pull and junction boxes may be installed flush mounted in gypsum, concrete, or CMU walls where appropriate provided that covers are easily removed or opened.
6. Pull and junction boxes shall be provided in the enclosure type and material of construction required for the area in which it is installed. Reference the requirements in Part 2 herein, and the area designations indicated on the Drawings.

END OF SECTION

SECTION 16195 – ELECTRICAL - IDENTIFICATION

SECTION 16195 ELECTRICAL - IDENTIFICATION

PART 1 – GENERAL

1.01 THE REQUIREMENT

- A. All electrical equipment shall be properly identified in accordance with these Specifications and the Contract Drawings. All electrical equipment shall be identified in the manner described, or in an equally approved manner.
- B. The types of electrical identification specified in this Section include, but are not limited to, the following:
 - 1. Operational instructions and warnings.
 - 2. Danger signs.
 - 3. Equipment/system identification signs.
 - 4. Nameplates.

1.02 SIGNS

- A. "DANGER-HIGH-VOLTAGE" signs shall be securely mounted on the entry doors of all electrical rooms.

1.03 LETTERING AND GRAPHICS

- A. The Contractor shall coordinate names, abbreviations, and other designations used in the electrical identification work with the corresponding designations shown, specified, or scheduled. Provide numbers, lettering, and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of the electrical systems and equipment.

1.04 SUBMITTALS

- A. In accordance with the procedures and requirements set forth in the General Conditions and Section 01300 – Record Drawings and Submittals , the Contractor shall obtain from the equipment manufacturer and submit shop drawings. Each submittal shall be identified by the applicable Specification Section.

1.05 SHOP DRAWINGS

- A. Each submittal shall be complete in all respects, incorporating all information and data listed herein and all additional information required for evaluation of the proposed equipment's compliance with the Contract Documents.

SECTION 16195 – ELECTRICAL - IDENTIFICATION

- B. Partial, incomplete, or illegible submittals will be returned to the Contractor without review for resubmittal.
- C. Shop drawings shall include but not be limited to:
 - 1. Product data sheets.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. The material covered by these Specifications is intended to be standard material of proven performance as manufactured by reputable concerns. Material shall be fabricated, constructed, and installed in accordance with the best practices of the trade, and shall operate satisfactorily when installed as specified herein and shown on the Drawings.

2.02 NAMEPLATES

- A. Nameplates shall be engraved, high pressure plastic laminate, black foreground with white lettering.
- B. Nameplates shall be attached to NEMA 4X enclosures utilizing UL-recognized mounting kits designed to maintain the overall UL Type rating of the enclosure. Mounting kit fasteners shall be stainless steel Type AHK10324X as manufactured by Hoffman, or Engineer approved equal.

2.03 HIGH VOLTAGE SIGNS

- A. Standard "DANGER" signs shall be of baked enamel finish on 20 gauge steel; of standard red, black, and white graphics; 14 inches by 10 inches size except where 10 inches by 7 inches is the largest size which can be applied where needed, and except where a larger size is needed for adequate identification.

2.04 CONDUIT IDENTIFICATION

- A. Conduit identification shall be as specified in Section 16111 - Conduit.

2.05 WIRE AND CABLE IDENTIFICATION

- A. Field installed wire and cable identification shall be as specified in Section 16123 – Low Voltage Wire and Cable.
- B. A plastic laminate nameplate shall be provided at each panelboard, motor control center, switchgear assembly, and switchboard assembly. This nameplate shall be used to

SECTION 16195 – ELECTRICAL - IDENTIFICATION

clearly convey the conductor identification means used at that piece of equipment (i.e., Phase A=Brown, Phase B=Orange, C = Yellow).

- C. Wiring identification for factory installed wiring in equipment enclosures shall be as specified in the respective Section.

PART 3 – EXECUTION

3.01 NAMEPLATES

- A. Nameplates shall be attached to the equipment enclosures with two (2) stainless steel sheet metal screws for nameplates up to 2-inches wide. For nameplates over 2-inches wide, four (4) stainless steel sheet metal screws shall be used, one (1) in each corner of the nameplate. The utilization of adhesives is not permitted.

3.02 OPERATIONAL IDENTIFICATION AND WARNINGS

- A. Wherever reasonably required to ensure safe and efficient operation and maintenance of the electrical systems and electrically connected mechanical systems and general systems and equipment, including prevention of misuse of electrical facilities by unauthorized personnel, install plastic signs or similar equivalent identification, instruction, or warnings on switches, outlets, and other controls, devices, and covers or electrical enclosures. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for the intended purposes. Signs shall be attached as specified above for nameplates.

3.03 POWER SOURCE IDENTIFICATION

- A. After installation of all field equipment (e.g., valves, motors, fans, unit heaters, instruments, etc.) install nameplates at each power termination for the field equipment. Nameplate data shall include equipment designation (tag number), power source (MCC number, panelboard, etc.), circuit number, conduit number from schedule and voltage/phase.
- B. Contractor to coordinate with the Engineer and the Owner regarding exact nameplate placement during construction.
- C. Nameplates shall be as specified herein.

END OF SECTION

SECTION 16195 – ELECTRICAL - IDENTIFICATION

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APPENDIX A:
GEOTECHNICAL
REPORT

GEOTECHNICAL INVESTIGATION

Olivenhain Municipal Water District (OMWD) Gardendale and Village Park West PRS Replacements Encinitas, California



Submitted to:
Balboa Engineering
14204 Caminito Lazanja
San Diego, California 92127

NOVA Project No. 2022250
September 18, 2023



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GEOTECHNICAL
MATERIALS
SPECIAL INSPECTION

DVBE ♦ SBE ♦ SDVOSB ♦ SLBE

Matt Dorman
Balboa Engineering
14204 Caminito Lanza
San Diego, California 92127

September 18, 2023
NOVA Project No. 2022250

Subject: Geotechnical Investigation
Olivenhain Municipal Water District (OMWD)
Gardendale and Village Park West and PRS Replacements
Encinitas, California


Dear Mr. Dorman:

NOVA Services, Inc. (NOVA) is pleased to present our report describing the geotechnical investigation performed for the Gardendale and Village Park West Pressure Reducing Station (PRS) Replacements project located in Encinitas, California. The geotechnical investigation was conducted in general conformance with the scope of work presented in our proposal dated June 20, 2022, and authorized on November 17, 2022.

This site is considered geotechnically suitable for the proposed improvements provided the recommendations within this report are followed.

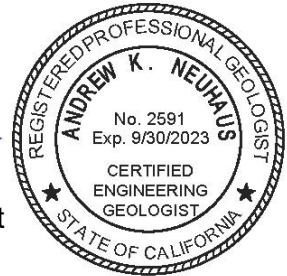
NOVA appreciates the opportunity to be of service to Balboa Engineering on this project. If you have any questions regarding this report, please call us at 619.922.6889.

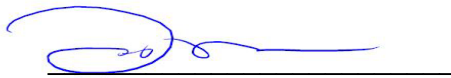
Sincerely,
NOVA Services, Inc.


Gillian Carzzarella Dean, PE
Senior Engineer




Andrew K. Neuhaus, CEG
Senior Engineering Geologist




Giovanni Norman, GIT
Staff Geologist



GEOTECHNICAL INVESTIGATION

Olivenhain Municipal Water District (OMWD) Gardendale and Village Park West PRS Replacements Encinitas, California

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1. INTRODUCTION

This report presents the results of the geotechnical investigation NOVA performed for the proposed Gardendale and Village Park West Pressure Reducing Station (PRS) Replacements project located near the intersections of Mountain Vista Drive at Wandering Road (Site 1) and Mountain Vista Drive at Gardendale Road (Site 2) in Encinitas, California. We understand the project will consist of the design and replacement of two PRS vaults located near these locations. The scope of work presented herein is based on direction provided by the project team, our experience with similar utility improvement projects, and our familiarity with the subsurface conditions beneath the new pipeline alignments. The purpose of NOVA's work is to provide conclusions and recommendations regarding the geotechnical aspects of the project. Figure 1-1 presents a site vicinity map. Figure 1-2 presents a site location map.

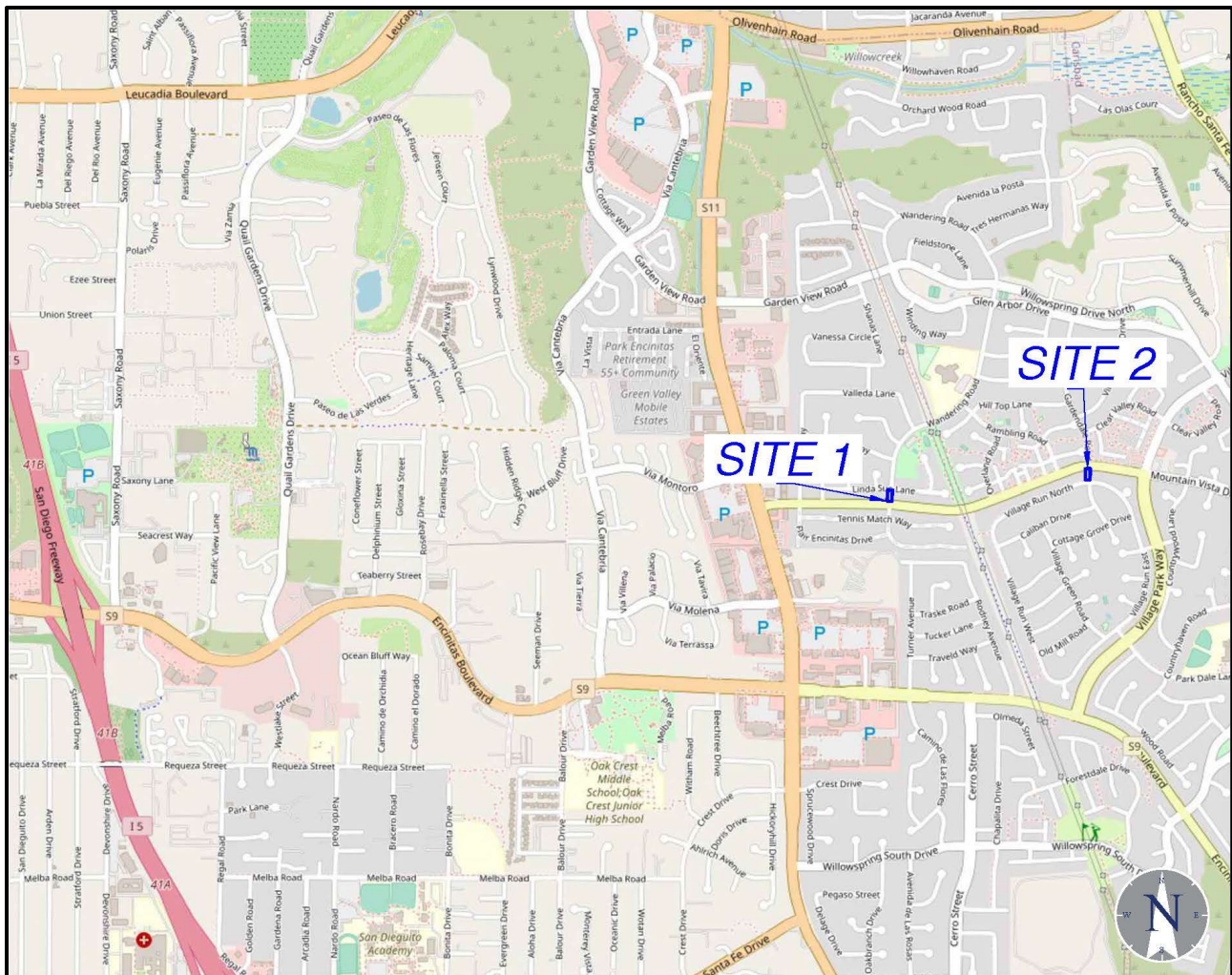


Figure 1-1. Site Vicinity Map

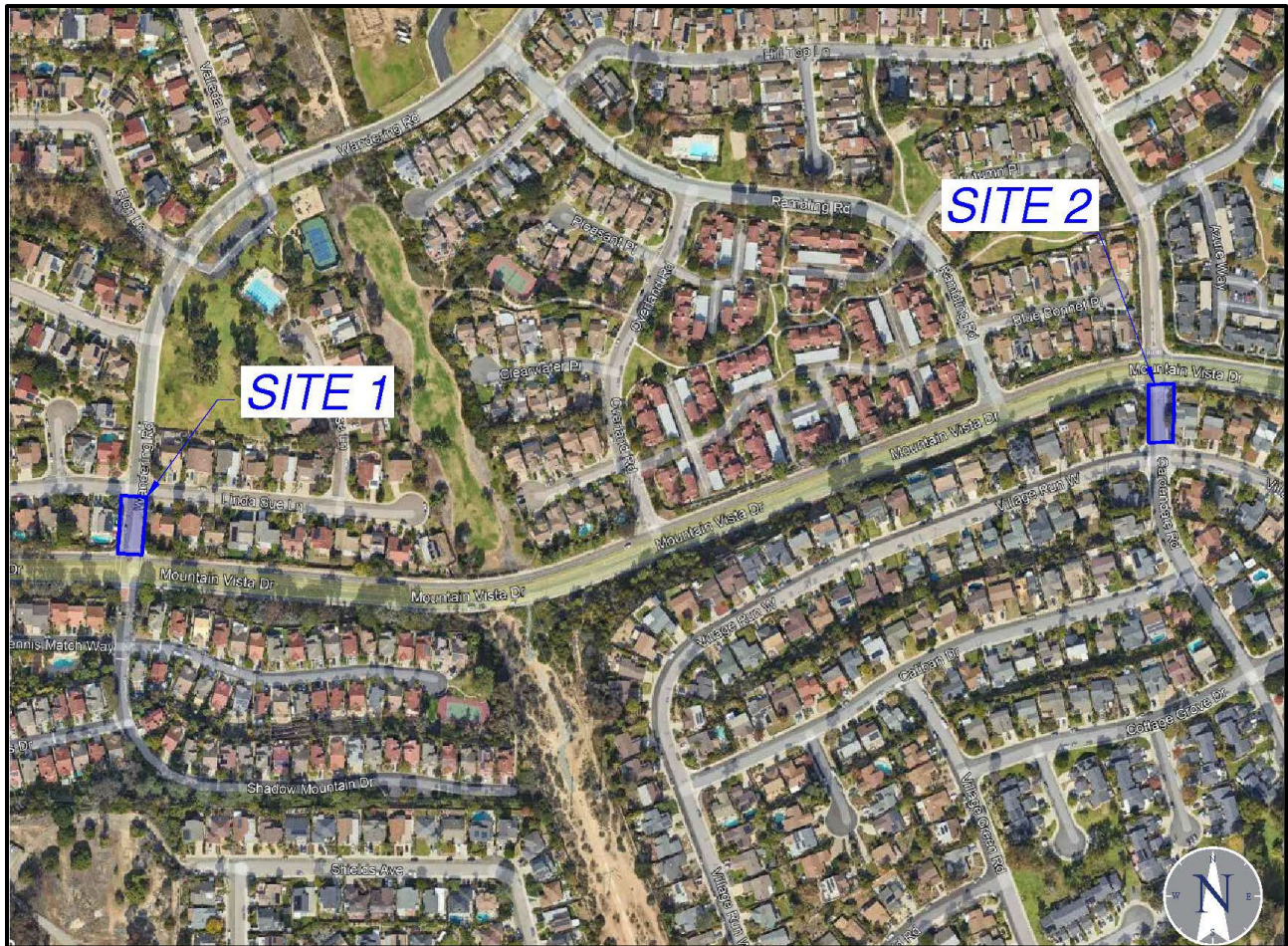


Figure 1-2. Site Location Map

2. SCOPE OF WORK

2.1. Field Investigation

NOVA's field investigation consisted of drilling two geotechnical borings to depths of about 20 feet and 26½ feet below the ground surface (bgs) using a truck-mounted drill rig equipped with a hollow-stem auger. Figure 2-1 presents a subsurface exploration map with the approximate locations of the borings.

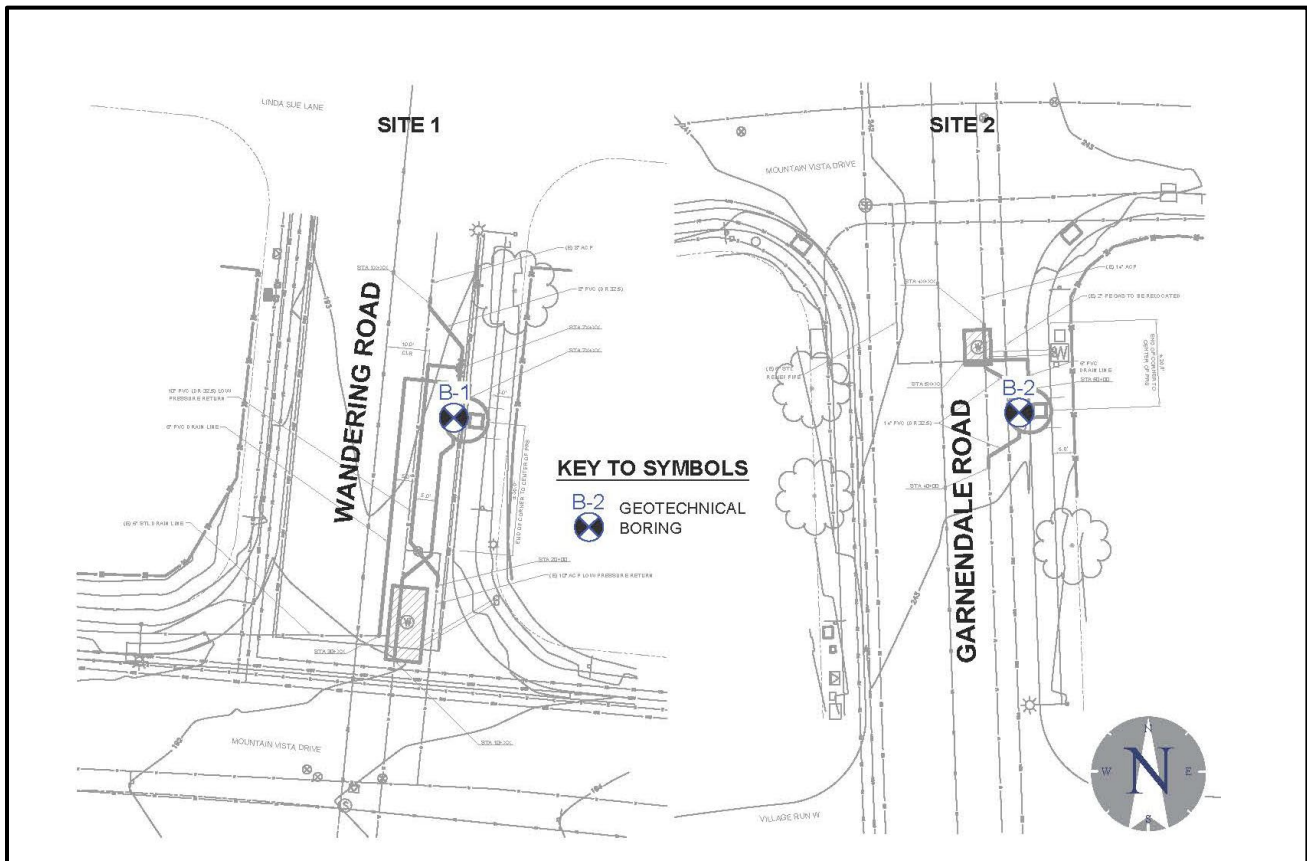


Figure 2-1. Subsurface Exploration Map

A NOVA geologist logged the borings and collected samples of the materials encountered for laboratory testing. Standard Penetration Tests (SPT) were performed in the borings using a 2-inch outer diameter and 1¾-inch inner diameter split tube sampler. The SPT sampler was driven using an automatic hammer with calibrated Energy Transfer Ratio (ETRs) of 73.9%. The number of blows needed to drive the sampler 18 inches is noted in three, 6-inch intervals on the logs. Sampler refusal was encountered when 50 blows were applied during any one of the three 6-inch intervals, a total of 100 blows was applied, or there was no discernible sampler advancement during the application of ten successive blows. The field blow counts, N, were corrected to a standard hammer (cathead and rope) with a 60% ETR. The corrected blow counts are noted on the boring logs as N₆₀. Disturbed bulk



samples were obtained from the SPT sampler and the drill cuttings. Logs of the borings are presented in Appendix B. Soils are classified according to the Unified Soil Classification System.

2.2. Laboratory Testing

NOVA tested select samples obtained from the borings to evaluate soil classification and engineering properties and develop geotechnical conclusions and recommendations. The laboratory tests consisted of particle-size distribution, percent passing No. 200 sieve, Atterberg limits, expansion index, and corrosivity. The results of the laboratory tests and brief explanations of the test procedures are presented in Appendix C.

2.3. Analysis and Report Preparation

The results of the field and laboratory testing were evaluated to develop conclusions and recommendations regarding the geotechnical aspects of the proposed construction. This report presents our findings, conclusions, and recommendations.



3. SITE AND PROJECT DESCRIPTION

3.1. Site Description

Site 1 consists of the western PRS and is located within Wandering Road between Linda Sue Lane and Mountain Vista Drive. Site 1 is relatively level, with elevations of +192 feet and +193 feet, respectively, at the south and north ends of Wandering Road. Site 2 consists of the eastern PRS and is located within Gardendale Road between Mountain Vista Drive and Village Run. Site 2 is relatively level, with an elevation of +243 feet along Gardendale Road. A review of published historical topographic maps indicates that a drainage, which flowed towards the west, was present in about the same location as Mountain Vista Drive. The drainage was filled between 1967 and 1978 during construction of the surrounding residential subdivisions. Fills with thicknesses on the order of about 7 and 18 feet, respectively, were placed at Site 1 and Site 2 to achieve current site grades.

3.2. Proposed Construction and Anticipated Earthwork

Based on our review of the provided plans (Balboa Engineering Inc., 2023), we understand the project will consist of the design and replacement of two PRS vaults located near the intersections of Mountain Vista Drive and Wandering Road and Mountain Vista Drive and Gardendale Road. Based on our discussions with the project team we understand the PRS will extend about 11 feet below the existing street surface. Final plans are not available at this time; however, we anticipate that earthwork will consist of backfilling the existing PRS vaults to be abandoned, shoring, dewatering, excavating for the installation of the proposed PRS vaults, utility trench relocating/backfilling, subgrade preparation, and pavement construction.

4. GEOLOGY AND SUBSURFACE CONDITIONS

4.1. Regional Geology

The site is located within the Peninsular Ranges Geomorphic Province of California, which stretches from the Los Angeles basin to the tip of Baja California in Mexico. This province is characterized as a series of northwest-trending mountain ranges separated by subparallel fault zones and a coastal plain of subdued landforms. The mountain ranges are underlain primarily by Mesozoic metamorphic rocks that were intruded by plutonic rocks of the western Peninsular Ranges Batholith, while the coastal plain is underlain by subsequently deposited marine and nonmarine sedimentary formations. The site is located within the coastal plain portion of the province, and a regional geologic map (CGS, 2008a) indicates the project sites are underlain by Quaternary young alluvial flood-plain deposits (Qya) and Tertiary Torrey Sandstone. Figure 4-1 presents the regional geology in the vicinity of the sites.

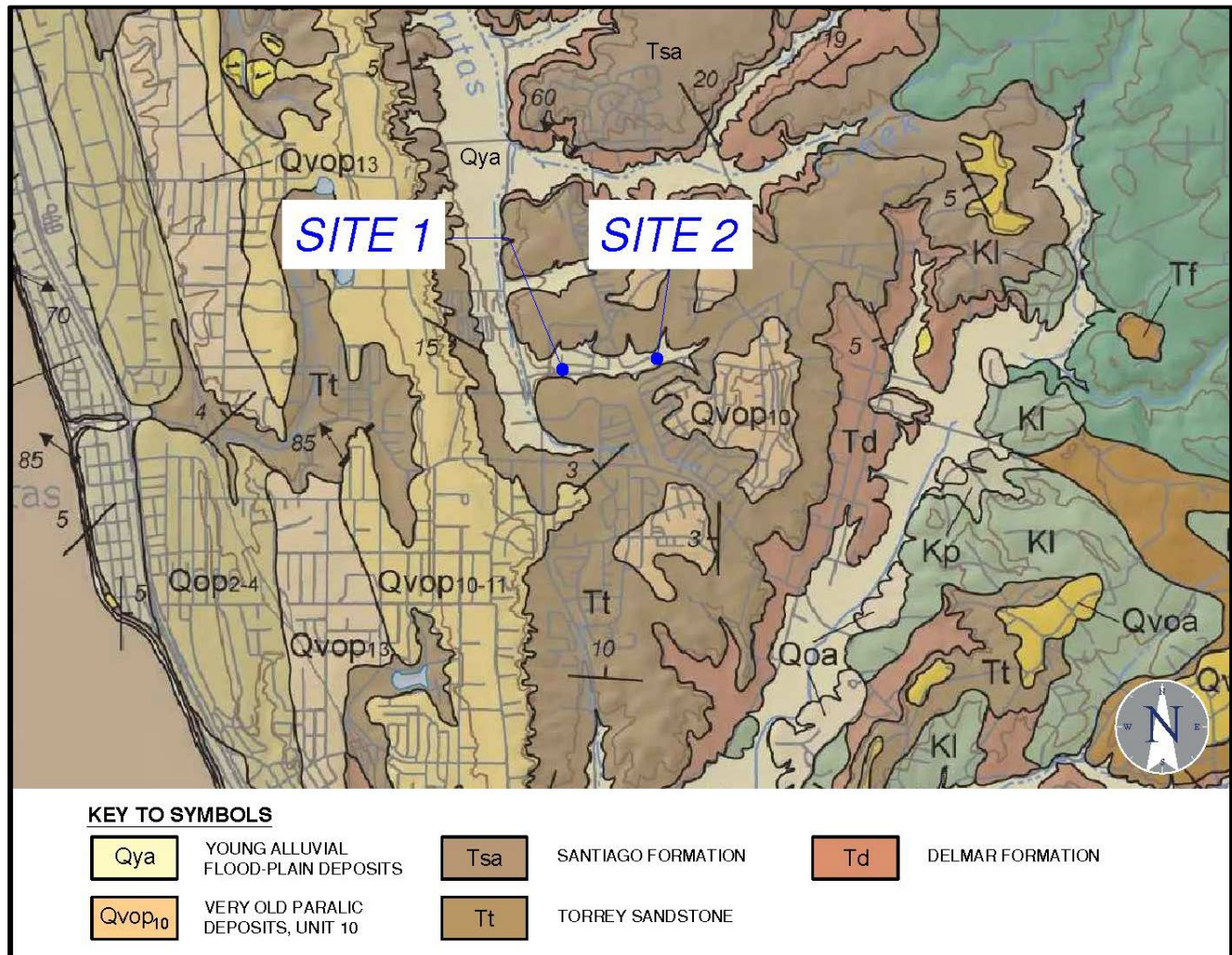


Figure 4-1. Regional Geologic Map

4.2. Pavement Sections

Table 4-1 summarizes the pavement sections measured in the borings.

Table 4-1. Measured Pavement Sections

Boring No.	Asphalt (inches)	Decomposed Granite (inches)	Pulverized Asphalt (inches)	Total Section Thickness (inches)
1	4	0	0	4
2	6	3	4	13

4.3. Site-Specific Geology

As observed in our borings, the site is underlain by fill, young alluvial flood-plain deposits, and Torrey Sandstone. Descriptions of the materials encountered are presented below.

Fill (af): Fill was encountered beneath the existing pavement to depths of about 5 feet bgs in Boring B-1 and 18½ feet bgs in Boring B-2. As encountered in the borings, the fill generally consisted of medium dense to dense silty and clayey sand. NOVA has no records regarding the placement and compaction of the fill; therefore, it is considered undocumented and at risk for wide variations in quality. Figure 4-2 presents a photograph of the fill in Boring B-2.



Figure 4-2. Fill in Boring B-2

Young Alluvial Flood-Plain Deposits (Qya): Young alluvial flood-plain deposits were encountered beneath the fill to depths of about 15½ feet bgs in Boring B-1 and to the maximum explored depth of about 26½ feet bgs in Boring B-2. As encountered in the borings, the alluvium generally consisted of moist to wet, loose to dense silty and clayey sand. Figure 4-3 presents a photograph of the young alluvium encountered in Boring B-2.



Figure 4-3. Young Alluvial Flood-Plain Deposits in Boring B-2

Torrey Sandstone (Tt): Torrey Sandstone was encountered beneath the alluvial deposits in Boring B-1 to the maximum explored depth of about 20 feet bgs. As encountered in the boring, these formational materials consisted of wet, very dense, weakly cemented interbedded silty sandstone and sandy siltstone. Figure 4-4 presents a photograph of the Torrey Sandstone encountered in Boring B-1.



Figure 4-4. Torrey Sandstone in Boring B-1

Groundwater: Groundwater was encountered at depths of about 7½ feet bgs in Boring B-1 and about 20 feet bgs in Boring B-2. Groundwater should be anticipated during construction. Groundwater may fluctuate in the future due to rainfall, irrigation, broken pipes, or changes in site drainage. Groundwater conditions are difficult to predict and therefore, such conditions are typically mitigated if and when they occur.

5. GEOLOGIC HAZARDS

5.1. Faulting and Surface Rupture

Major known active faults in the region consist generally of an echelon, northwest striking, right-lateral, strike-slip faults. These include the San Andreas, Elsinore, and San Jacinto Faults located northeast of the project sites; and the San Clemente, San Diego Trough, and Agua Blanca-Coronado Bank Faults and Newport-Inglewood-Rose Canyon Fault Zone (NIRC) located to the west of the project sites.

Earthquake Fault Zones have been established along known active faults in California in accordance with the Alquist-Priolo Earthquake Fault Zoning Act. The State Geologist defines an “active” fault as one which has had surface rupture within recent geologic time (i.e., Holocene time, <11,700 years before present) (b.p.). Earthquake Fault Zones have been delineated to encompass traces of known Holocene-active faults to address hazards associated with fault surface rupture within California. Where developments for human occupancy are proposed within these zones, the state requires detailed fault evaluations be performed so that engineering geologists can identify the locations of active faults and recommend setbacks from locations of possible surface fault rupture.

The sites are not located in Alquist-Priolo Earthquake Fault Zones. The nearest active fault is located is about 5 miles southwest from Site 1 within the Oceanside section of the NIRC, which is recognized to have the potential for a Magnitude 6.99 seismic event. Evidence of active faulting was not observed at the site during our field investigation. The probability of fault rupture is considered very low. Figure 5-1 shows the locations of known faults in the region of the sites (CGS, 2023).

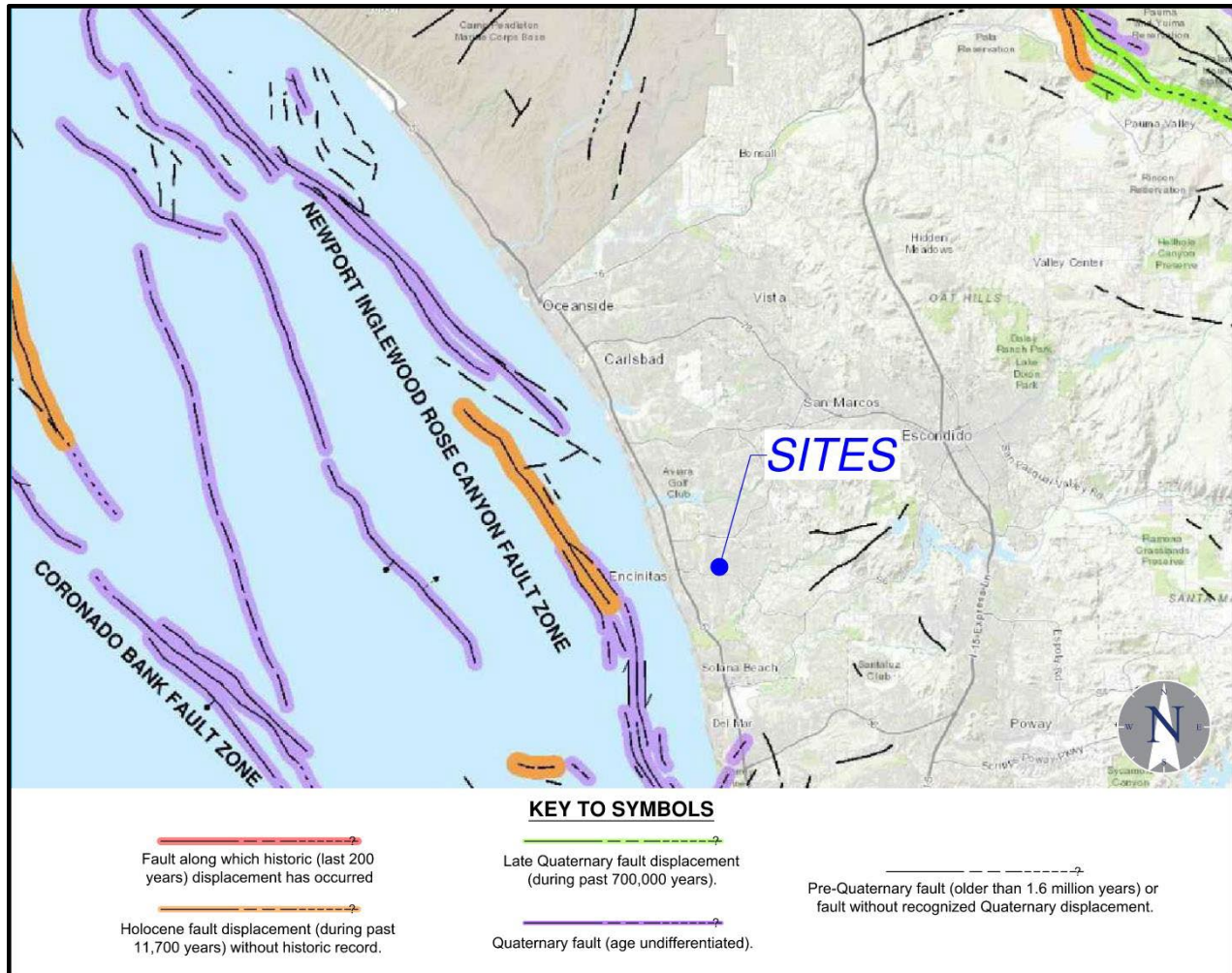


Figure 5-1. Faulting in the Site Vicinity

5.2. California Building Code (CBC) Seismic Design Parameters

A geologic hazard likely to affect the project is ground shaking as a result of movement along an active fault zone in the vicinity of the subject site. Based on the subsurface conditions encountered during our investigation, the sites may be classified as Site Class D. The site coefficients and maximum considered earthquake (MCE_R) spectral response acceleration parameters in accordance with the 2022 CBC and ASCE 7-16 are presented in Tables 5-1 and 5-2.

For a Site Class D, a site-specific ground motion hazard analysis (GMHA) is required to be performed in accordance with the requirements of 2022 CBC and ASCE 7-16. The parameters presented in Tables 5-1 and 5-2 utilize the exception contained in ASCE 7-16, Supplement 3, Section 11.4.8 which allows for omission of a site-specific GMHA if a 50% increase is applied to the S_{M1} value and resulting S_{D1} value. NOVA should be contacted if the structural engineer requests a GMHA to support the structural design.

Table 5-1. 2022 CBC and ASCE 7-16 Seismic Design Parameters (Site 1)

Site Coordinates	
Latitude: 33.05203°	Longitude: -117.25572°
Site Coefficients and Spectral Response Acceleration Parameters	
	Value
Site Class	D
Site Coefficients, F_a	1.078
Site Coefficients, F_v	1.921
Mapped Spectral Response Acceleration at Short Period, S_s	1.054g
Mapped Spectral Response Acceleration at 1-Second Period, S_1	0.379g
Site-modified spectral acceleration value at Short Period, S_{MS}	1.137g
Site-modified spectral acceleration value at 1-Second Period, S_{M1}	1.092g
Mapped Design Spectral Acceleration at Short Period, S_{DS}	0.758g
Design Spectral Acceleration at 1-Second Period, S_{D1}	0.728g
Site Peak Ground Acceleration, PGA_M	0.528g

Table 5-2. 2022 CBC and ASCE 7-16 Seismic Design Parameters (Site 2)

Site Coordinates	
Latitude: 33.05293°	Longitude: -117.24809°
Site Coefficients and Spectral Response Acceleration Parameters	
	Value
Site Class	D
Site Coefficients, F_a	1.090
Site Coefficients, F_v	1.930
Mapped Spectral Response Acceleration at Short Period, S_s	1.026g
Mapped Spectral Response Acceleration at 1-Second Period, S_1	0.370g
Site-modified spectral acceleration value at Short Period, S_{MS}	1.118g
Site-modified spectral acceleration value at 1-Second Period, S_{M1}	1.071g
Mapped Design Spectral Acceleration at Short Period, S_{DS}	0.745g
Design Spectral Acceleration at 1-Second Period, S_{D1}	0.714g
Site Peak Ground Acceleration, PGA_M	0.518g

5.3. Landslides and Slope Stability

Evidence of landslides, deep-seated landslides, or slope instabilities was not observed at the time of NOVA's field evaluation. Additionally, there are no mapped landslides in the vicinity of the project site. The potential for landslides or slope instabilities to occur at the site is considered very low given the flat topography and relatively flat-lying geological structure below the site.

5.4. Liquefaction and Dynamic Settlement

Liquefaction occurs when loose, saturated, generally fine sands and silts are subjected to strong ground shaking. The soils lose shear strength and become liquid, resulting in large total and differential ground surface settlements, as well as possible lateral spreading during an earthquake. The site is not located within a mapped liquefaction zone. However, due to the presence of shallow groundwater and loose sand layers within the alluvial deposits beneath the sites, the potential for liquefaction and dynamic settlement may exist. Evaluation of liquefaction and dynamic settlement was not a part of NOVA's scope of work. Liquefaction analysis can be performed upon request for an additional fee.

5.5. Flooding, Tsunamis, and Seiches

The sites are mapped within areas of minimal flood hazard (FEMA, 2012, 2019). The sites are not located within mapped areas on the State of California Tsunami Inundation Maps (CGS, 2022); therefore, the potential for damage due to tsunamis is considered low. Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays, or reservoirs. The sites are not located adjacent to any lakes or confined bodies of water; therefore, the potential for a seiche to affect the sites is considered low.

5.6. Subsidence

The site is not located in an area of known subsidence associated with fluid withdrawal (groundwater or petroleum); therefore, the potential for subsidence due to the extraction of fluids is considered low.

5.7. Hydro-Consolidation

Hydro-consolidation can occur in recently deposited sediments (less than 10,000 years old) that were deposited in a semi-arid environment. Examples of such sediments are eolian sands, alluvial fan deposits, and mudflow sediments deposited during flash floods. The pore spaces between the particle grains can re-adjust when inundated by groundwater, causing the material to consolidate. The fill, Torrey Sandstone, and saturated alluvium (i.e., below groundwater) are not considered susceptible to hydro-consolidation. The loose alluvium above the perched groundwater may be susceptible to hydro-consolidation. Hydro-consolidation can be mitigated by performing remedial grading in accordance with the recommendations of this report.

6. CONCLUSIONS

Based on the results of NOVA's investigation, we consider the proposed construction feasible from a geotechnical standpoint provided the recommendations contained in this report are followed. Geotechnical conditions exist that should be addressed prior to construction. Geotechnical design and construction considerations include the following.

- There are no known active faults underlying the site. The primary seismic hazards at the site are moderate to severe ground shaking in response to large-magnitude earthquakes generated during the lifetime of the proposed construction. The risk of strong ground motion is common to all construction in southern California and is typically mitigated through building design in accordance with the CBC.
- The site is not located within a mapped liquefaction zone. However, due to the presence of shallow groundwater and loose sand layers within the alluvial deposits beneath the sites, the potential for liquefaction and dynamic settlement may exist. Liquefaction could result in damage to OMWD's facilities unless mitigation measures were implemented. Evaluation of liquefaction and dynamic settlement was not a part of NOVA's scope of work.
- The site is underlain by fill, young alluvial flood-plain deposits, and Torrey Sandstone. The Torrey Sandstone is considered suitable for support of the proposed improvements. The fill and alluvium, however, are loose and potentially compressible. To improve subgrade support and further reduce the potential for settlement, remedial grading of the upper subgrade soils will need to be performed. Recommendations for remedial grading are provided herein.
- In general, excavations should be achievable using standard equipment in good working order with experienced operators. However, cemented formational materials may require extra excavation effort or may encounter excavation refusal. Additionally, excavations may generate oversized material that will require extra effort to screen for use as compacted fill or export from the site. Groundwater should be anticipated in the excavations.
- Groundwater was encountered at depths of about 7½ feet bgs in Boring B-1 and about 20 feet bgs in Boring B-2. Groundwater should be anticipated during construction. Groundwater levels may fluctuate in the future due to changes in land use, damaged pipes, and/or following periods of heavy rain. Seasonal fluctuations of groundwater elevations should be expected over time. In general, groundwater levels fluctuate with the seasons and local zones of perched groundwater may be present within the near-surface deposits due to local landscape irrigation or precipitation, especially during rainy seasons. Because groundwater rise or seepage is difficult to predict, such conditions are typically mitigated if and when they occur.

7. RECOMMENDATIONS

The remainder of this report presents recommendations regarding earthwork construction as well as geotechnical recommendations for the design of the proposed PRS and associated improvements. These recommendations are based on empirical and analytical methods typical of the standard of practice in southern California. If these recommendations appear not to address a specific feature of the project, please contact our office for additions or revisions to the recommendations.

7.1. Earthwork

Earthwork is anticipated to include backfilling the existing PRS vaults to be abandoned, shoring, dewatering, excavating for the installation of the PRS vaults, utility trench relocating/backfilling and subgrade preparation. Earthwork should be conducted in accordance with the CBC and with the recommendations of this report. The following recommendations are provided regarding specific aspects of the proposed earthwork construction. These recommendations should be considered subject to revision based on field conditions observed by the geotechnical consultant during grading.

7.1.1 Site Preparation

Site preparation should begin with the removal of existing improvements, vegetation, and debris. Subsurface improvements that are abandoned should be removed, and the resulting excavations should be backfilled and compacted in accordance with the recommendations of this report. Pipeline abandonment can consist of capping or rerouting at the project perimeter and removal within the project limits. If appropriate, abandoned pipelines can be filled with grout or slurry as recommended by and observed by the geotechnical consultant.

7.1.2 Remedial Grading

Beneath the proposed PRS vaults, the existing soils should be excavated to a depth of at least 2 feet below the bottom of vault elevation and recompacted to provide a uniform thickness of compacted fill beneath the vault. Horizontally, excavations should extend the width of the vault. NOVA should observe the conditions exposed in the bottom of excavations to evaluate whether additional excavation is recommended.

7.1.3 Construction Dewatering

Excavations extending near or below groundwater will require temporary construction dewatering of the site to lower and maintain depressed groundwater levels during construction. Dewatering will be needed to construct the PRS vault at Site 1 and may be needed to construct the PRS vault at Site 2. Groundwater should be drawn down at least 3 feet below the bottom of the deepest planned excavation to reduce the possibility of wet, unstable soils. Groundwater must remain at this depressed level during construction until structure loads and uplift resistance are sufficient to counteract buoyant forces with groundwater at historic levels. The dewatering method should be evaluated and implemented by an experienced dewatering subcontractor.

7.1.4 Expansive Soil

The on-site soils tested have EIs of 0 and 2, classified as very low expansion potential. To reduce the potential for expansive heave, the top 2 feet of material beneath the PRS vaults should have EI of 50 or less. Horizontally, the soils having an EI of 50 or less should extend the width of the vaults. Based on the results of our laboratory testing, we expect that the on-site soils will generally meet the EI criteria. Clays, if encountered, may not meet the EI criteria.

7.1.5 Excavation Characteristics

It is anticipated that excavations can be achieved with conventional earthwork equipment in good working order. However, cemented formational materials may require extra excavation effort or may encounter excavation refusal. Additionally, excavations may generate oversized material that will require extra effort to screen for use as compacted fill or export from the site. Additionally, groundwater should be anticipated.

7.1.6 Temporary Excavations

Temporary excavations 3 feet deep or less can be made vertically. Deeper temporary excavations in unsaturated fill and alluvium should be laid back no steeper than 1½:1 (horizontal:vertical) (h:v). Deeper temporary excavations in cemented formational materials (Torrey Sandstone) should be laid back no steeper than ¾:1 (h:v). The faces of temporary slopes should be inspected daily by the contractor's Competent Person before personnel are allowed to enter the excavation. Zones of potential instability, sloughing, or raveling should be brought to the attention of the engineer and corrective action implemented before personnel begin working in the trench.

Slopes steeper than those described above will require shoring. Soldier piles and lagging, corrugated metal pipe, internally braced shoring, or trench boxes could be used. If trench boxes or corrugated metal pipe are used, the soil immediately adjacent to the shoring is not directly supported. Ground surface deformations immediately adjacent to the pit or trench could be greater where trench boxes are used compared to other methods of shoring.

Excavated soils should not be stockpiled behind temporary excavations within a distance equal to the depth of the excavation. NOVA should be notified if other surcharge loads are anticipated so that lateral load criteria can be developed for the specific situation. If temporary slopes are to be maintained during the rainy season, berms are recommended along the tops of slopes to prevent runoff water from entering the excavation and eroding the slope faces.

7.1.7 Temporary Shoring

For design of cantilevered shoring, active soil pressures equal to fluids weighing 39 and 79 pounds per cubic feet (pcf) can be used above and below groundwater, respectively, for level retained ground. The surcharge loads on shoring from traffic and construction equipment adjacent to the excavation can be modeled by assuming an additional 2 feet of soil behind the shoring. For design of soldier piles, allowable passive pressures of 300 and 140 pounds per square foot (psf) per foot of embedment over

twice the pile diameter up to maximums of 3,000 psf and 1500 psf, can be used, respectively, above and below groundwater.

Soldier piles should be spaced at least three pile diameters, center to center. Continuous lagging will be required throughout. The soldier piles should be designed for the full anticipated lateral pressure; however, the pressure on the lagging will be less due to arching in the soils. For design of lagging, the earth pressure can be limited to a maximum value of 400 psf.

Piles should be filled with concrete immediately after drilling. The concrete should be pumped to the bottom of the drilled holes using the tremie method. If casing is used, the casing should be removed as the concrete is placed, keeping the level of concrete at least 5 feet above the bottom of the casing at all times.

7.1.8 Subgrade Stabilization

Wet, unstable excavation bottoms will likely be encountered due to shallow groundwater at the site. The bottom of excavations should be firm and unyielding prior to placing compacted fill or constructing structures or improvements. If the bases of excavations are saturated and yielding, they can be stabilized by placing between 1 and 2 feet of ¾-inch crushed rock on the excavation bottom. If rock is used to stabilize yielding excavation bottoms, we recommend placing the Tensar® InterAx™ NX650 reinforcing geogrid within the crushed rock (at least 6 inches of rock beneath the geogrid). The thickness of rock needed to stabilize the excavation bottom may be determined in the field by trial and error. Our experience suggests that 2 feet of crushed rock and reinforcing geogrid should generally be sufficient to stabilize most yielding conditions.

7.1.9 Compacted Fill

Excavated soils free of organic matter, construction debris, rocks greater than 6 inches, and expansive soil as described above should generally be suitable for reuse as compacted fill. Areas to receive fill should be scarified to a depth of 6 to 8 inches, moisture conditioned to near optimum moisture content, and compacted to at least 90% relative compaction. Fill and backfill should be placed in 6- to 8-inch-thick loose lifts, moisture conditioned to near optimum moisture content, and compacted to at least 90% relative compaction. The top 12 inches of subgrade beneath pavements should be compacted to at least 95% relative compaction. The maximum density and optimum moisture content for the evaluation of relative compaction should be determined in accordance with ASTM D1557.

7.1.10 Imported Soil

Imported soil should consist of predominately granular soil free of organic matter and rocks greater than 6 inches. Imported soil should be observed and, if appropriate, tested by NOVA prior to transport to the site to assess suitability for the intended use.

7.1.11 Oversized Material

Excavations may generate oversized material. Oversized material is defined as rocks or cemented clasts greater than 6 inches in largest dimension. Oversized material should be broken down to no

greater than 6 inches in largest dimension for use in fill, used as landscape material, or disposed of off-site.

7.2. Long-Term Groundwater Considerations

As currently planned, the PRS vault at Site 1 will extend below the observed groundwater level. Slabs, foundations, and walls below groundwater should be waterproofed and designed for full hydrostatic pressure at the highest anticipated future groundwater levels. Because the highest groundwater levels are not known, an estimated design groundwater level will have to be assumed for design. We recommend using a design groundwater level 5 feet above the highest observed groundwater level. Based on groundwater levels observed during our investigation, this would correspond to elevations of about +191½ feet at Site 1 and +228 feet at Site 2. We recommend providing an emergency backup subdrain system that would be activated if groundwater levels exceeded the design level to protect against structural damage of the vaults. The backup subdrain system should be outlet at the design hydrostatic elevation. A registered civil engineer should design the emergency backup subdrain system. The project structural engineer should confirm that the buoyant uplift forces do not exceed the structure's resisting forces.

Because full hydrostatic pressure will ultimately be imposed on the below-grade vault floors and portions of the below-grade vault walls, increased water vapor should be anticipated. The increased water vapor may adversely affect moisture-sensitive flooring or equipment. It may be warranted to construct vapor control barriers and dehumidifying systems.

7.3. Foundations

The foundation recommendations provided herein are considered generally consistent with methods typically used in southern California. Other alternatives may be available. NOVA's recommendations are only minimum criteria based on geotechnical factors and should not be considered a structural design, or to preclude more restrictive criteria of governing agencies or by the structural engineer. The design of the foundation system should be performed by the project structural engineer, incorporating the geotechnical parameters described herein and the requirements of applicable building codes.

The proposed PRS vaults can be supported on shallow spread footings with bottom levels bearing entirely on compacted fill. PRS vaults should be designed to resist hydrostatic uplift forces or anchored with tie downs.

7.3.1 Spread Footings

Footings should extend at least 24 inches below lowest adjacent finished grade. A minimum width of 18 inches is recommended for continuous footings and 24 inches for isolated footings or site wall footings. An allowable bearing capacity of 2,500 psf can be used for spread footings supported on compacted fill. An allowable bearing capacity of 1,200 psf should be used below groundwater level. The allowable bearing capacity can be increased by 300 psf for each additional foot of depth below the minimum and 100 psf for each additional foot of width beyond the minimum up to maximums of 5,000 psf for footings bearing above groundwater or 2,500 psf below groundwater level.

Lateral loads will be resisted by friction between the bottoms of footings and passive pressure on the faces of footings and other structural elements below grade. An allowable coefficient of friction of 0.35 can be used. An allowable passive pressure of 300 psf per foot of depth below the ground surface can be used for level ground conditions above groundwater. An allowable passive pressure of 140 psf per foot of depth below the ground surface can be used for level ground conditions below groundwater. The allowable passive pressure should be reduced for sloping ground conditions. The passive pressure can be increased by $\frac{1}{3}$ when considering the total of all loads, including wind or seismic forces. The upper 1 foot of soil should not be relied on for passive support unless the ground is covered with pavements or slabs.

Buoyant uplift forces may be resisted by the weight of the structure, plus the weight of compacted soil overlying footings extending outside the perimeter of the structure, plus the weight of compacted soil overlying the top of the vaults, plus side friction. If buoyant forces exceed these resisting forces, tie-down anchors can be used to provide additional uplift resistance. We can provide geotechnical parameters for design of tie-down anchors upon request, if needed. The bearing value can be increased by $\frac{1}{3}$ when considering the total of all loads, including wind or seismic forces.

7.3.2 Settlement Characteristics

Total static foundation settlements are estimated to be less than 1 inch. Differential settlements are estimated to be less than $\frac{1}{2}$ inch over a distance of 40 feet. Settlements should be completed shortly after structural loads are applied. As previously mentioned, the potential for liquefaction and dynamic settlement to occur exists. Liquefaction analysis was not part of our scope of work. Therefore, post-liquefaction and dynamic settlements were not estimated for this report.

7.3.3 Foundation Plan Review

NOVA should review the foundation plans to ascertain that the intent of the recommendations in this report has been implemented and that revised recommendations are not necessary as a result of changes after this report was completed.

7.3.4 Foundation Excavation Observations

A representative from NOVA should observe the foundation excavations prior to forming or placing reinforcing steel.

7.4. Pipelines

7.4.1 Modulus of Soil Reaction

The modulus of soil reaction (E') is used to characterize the stiffness of soil backfill placed along the side of buried flexible pipelines for evaluating deflection due to the load associated with trench backfill over the pipe. A value of 1,000 psi is recommended for the modulus of soil reaction assuming that granular bedding material is placed adjacent to the pipe and is compacted to a minimum of 90% relative compaction.

7.4.2 Pipe Bedding

Pipe bedding as specified in the Greenbook Standard Specifications for Public Works Construction can be used. Bedding material should consist of clean sand having a sand equivalent not less than 20 and should extend to at least 12 inches above the top of pipe. Alternative materials meeting the intent of the bedding specifications are also acceptable. Samples of materials proposed for use as bedding should be provided to the engineer for inspection and testing before the material is imported for use on the project. The on-site materials are not expected to meet Greenbook bedding specifications (i.e., clean sand) and cannot be processed to meet the requirements as the material types cannot be changed. The pipe bedding material should be placed over the full width of the trench. After placement of the pipe, the bedding should be brought up uniformly on both sides of the pipe to reduce the potential for unbalanced loads. No voids or uncompacted areas should be left beneath the pipe haunches. Ponding or jetting the pipe bedding should not be allowed.

Where pipeline inclinations exceed 15%, cutoff walls are recommended in trench excavations. Additionally, we do not recommend that open graded rock be used for pipe bedding or backfill because of the potential for piping erosion. The recommended bedding is clean sand having a sand equivalent not less than 20 or 2-sack sand/cement slurry. If sand/cement slurry is used for pipe bedding to at least 1 foot over the top of the pipe, cutoff walls are not considered necessary. The need for cutoff walls should be further evaluated by the project civil engineer designing the pipeline.

7.4.3 Trench Backfill

Utility trench sections should conform to the minimum requirements of the City of Encinitas. In our opinion, the excavated on-site material, except for soil containing roots, debris, and rock greater than 6 inches, can be used as trench backfill provided it meets the recommendations for fill material. However, in our opinion, the on-site material will not meet the most recent edition of the Greenbook (2021), which states that trench backfill material should have a sand equivalent (SE) greater than 20.

Backfill should be placed in 6-inch to 8-inch-thick loose lifts, moisture conditioned to near optimum moisture content, and compacted to at least 90% relative compaction of the material's maximum dry density. Where trench backfill is to be placed on surfaces inclined steeper than 5:1 h:v, benches should be excavated to provide a relatively level surface for fill placement. Benches should extend through any loose soils to expose competent material.

The top 12 inches of trench backfill beneath paved areas should be moisture conditioned to near optimum moisture content and compacted to at least 95% relative compaction of the material's maximum dry density. Aggregate base material should be compacted to at least 95% relative compaction. Materials and methods of construction should conform to good engineering practices and the City of Encinitas Design Standards. The maximum dry density and optimum moisture content for the evaluation of relative compaction should be determined in accordance with ASTM D1557. It should be noted that maximum dry density and optimum moisture content is dependent on the properties of the selected material.

7.4.4 Trench Resurfacing

Trench resurfacing (pavement replacement) should conform to the minimum requirements of the City of Encinitas. We recommend resurfacing in accordance with San Diego Regional Standard Drawings Nos. G-24A, G-24B, and G-25 (2022). Resurfacing efforts should satisfy the minimum requirements of the City of Encinitas project inspector, which may be more stringent.

7.4.5 Thrust Blocks

For level ground conditions, a passive earth pressure of 250 psf per foot of depth below the lowest adjacent final grade can be used to compute allowable thrust block resistance. A value of 130 psf per foot should be used below groundwater level, if encountered.

7.5. Soil Corrosivity

Representative samples of the on-site soils from the project alignment were tested to evaluate corrosion potential. The test results are presented in Appendix C. The project design engineer can use the sulfate results in conjunction with ACI 318 to specify the water/cement ratio, compressive strength, and cementitious material types for concrete exposed to soil. A corrosion engineer should be contacted to provide specific corrosion control recommendations.

7.6. Pavement Section Recommendations

Based on the near-surface soils encountered during our investigation, an R-value of 15 was assumed for design of preliminary pavement sections. The actual R-value of the subgrade soils should be determined after grading, and the final pavement sections should be provided. We anticipate that the pavements above the PRS vaults will be replaced in kind, however, if new pavements are constructed, preliminary pavement structural sections are provided in Table 7-1 for the assumed Traffic Indexes.

Table 7-1. AC and PCC Pavement Sections

Traffic Type	Traffic Index	Asphalt Concrete (inches)	Portland Cement Concrete (inches)
Driveways	6.0	4 AC / 10 AB	7 PCC / 4 AB
Fire Lanes	7.5	5 AC / 14 AB	7½ PCC / 4 AB

AC: Asphalt Concrete

AB: Aggregate Base

PCC: Portland Cement Concrete

Subgrade preparation should be performed immediately prior to placement of the pavement section. The upper 12 inches of subgrade should be scarified, moisture conditioned to near optimum moisture content, and compacted to at least 95% relative compaction. All soft or yielding areas should be stabilized or removed and replaced with compacted fill or aggregate base. Aggregate base and asphalt concrete should conform to the Caltrans Standard Specifications or the Greenbook Standard Specifications for Public Works Construction and should be compacted to at least 95% relative



September 18, 2023

compaction. Aggregate base should have an R-value of not less than 78. All materials and methods of construction should conform to good engineering practices and the minimum local standards.

8. CLOSURE

NOVA should review project plans and specifications prior to bidding and construction to check that the intent of the recommendations in this report has been incorporated. Observations and tests should be performed during construction. If the conditions encountered during construction differ from those anticipated based on the subsurface exploration program, the presence of personnel from NOVA during construction will enable an evaluation of the exposed conditions and modifications of the recommendations in this report or development of additional recommendations in a timely manner.

NOVA should be advised of changes in the project scope so that the recommendations contained in this report can be evaluated with respect to the revised plans. Changes in recommendations will be verified in writing. The findings in this report are valid as of the date of this report. Changes in the condition of the site can, however, occur with the passage of time, whether they are due to natural processes or work on this or adjacent areas. In addition, changes in the standards of practice and government regulations can occur. Thus, the findings in this report may be invalidated wholly or in part by changes beyond NOVA's control. This report should not be relied upon after a period of two years without a review by NOVA verifying the suitability of the conclusions and recommendations to site conditions at that time.

In the performance of professional services, NOVA exercises the level of care and skill ordinarily exercised by members of the geotechnical profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the boring locations and that the data, interpretations, and recommendations reported herein are based solely on the information obtained by NOVA. NOVA will be responsible for those data, interpretations, and recommendations, but shall not be responsible for interpretations by others of the information developed. Our services consist of professional consultation and observation only, and no warranty whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

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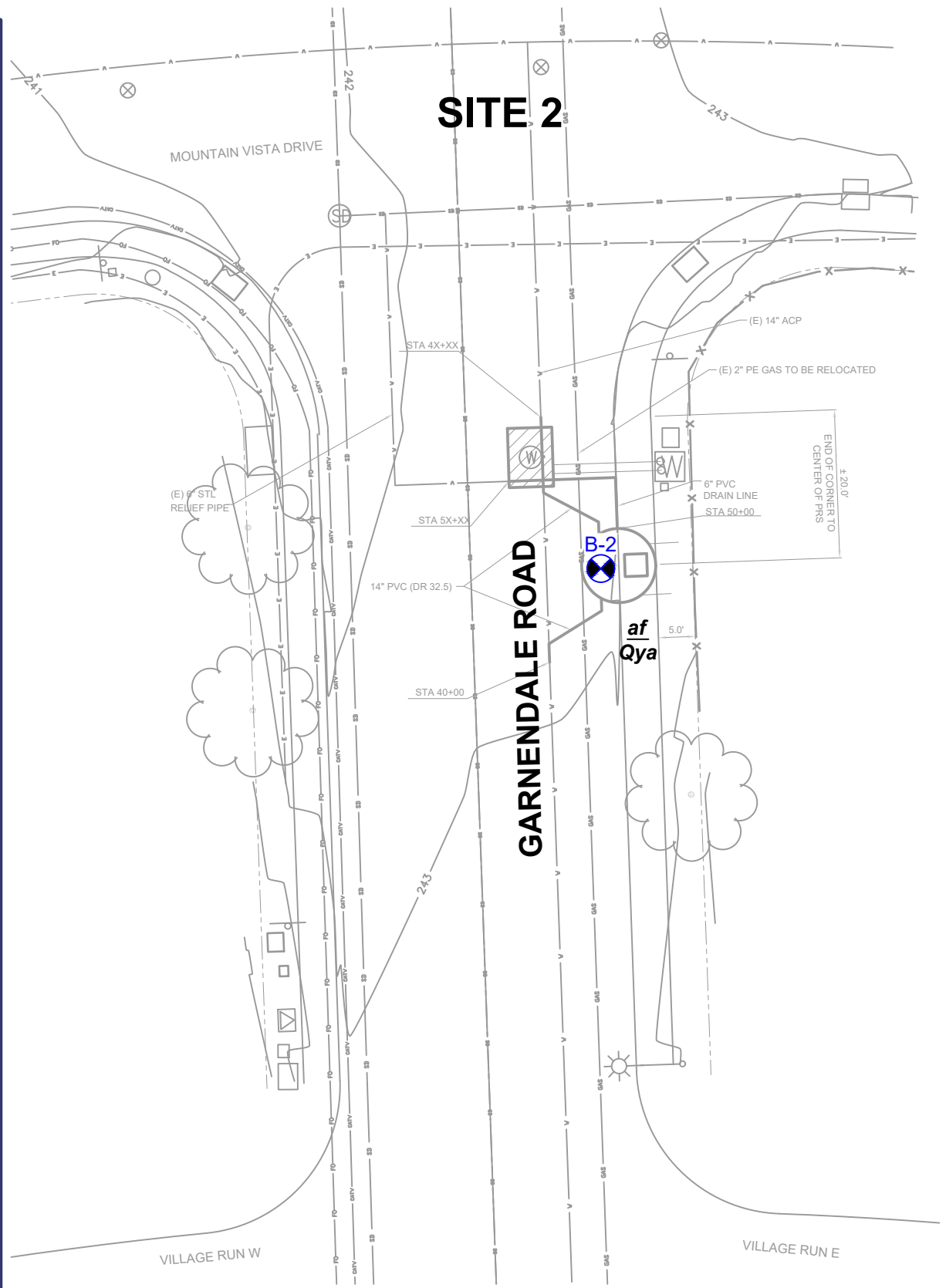
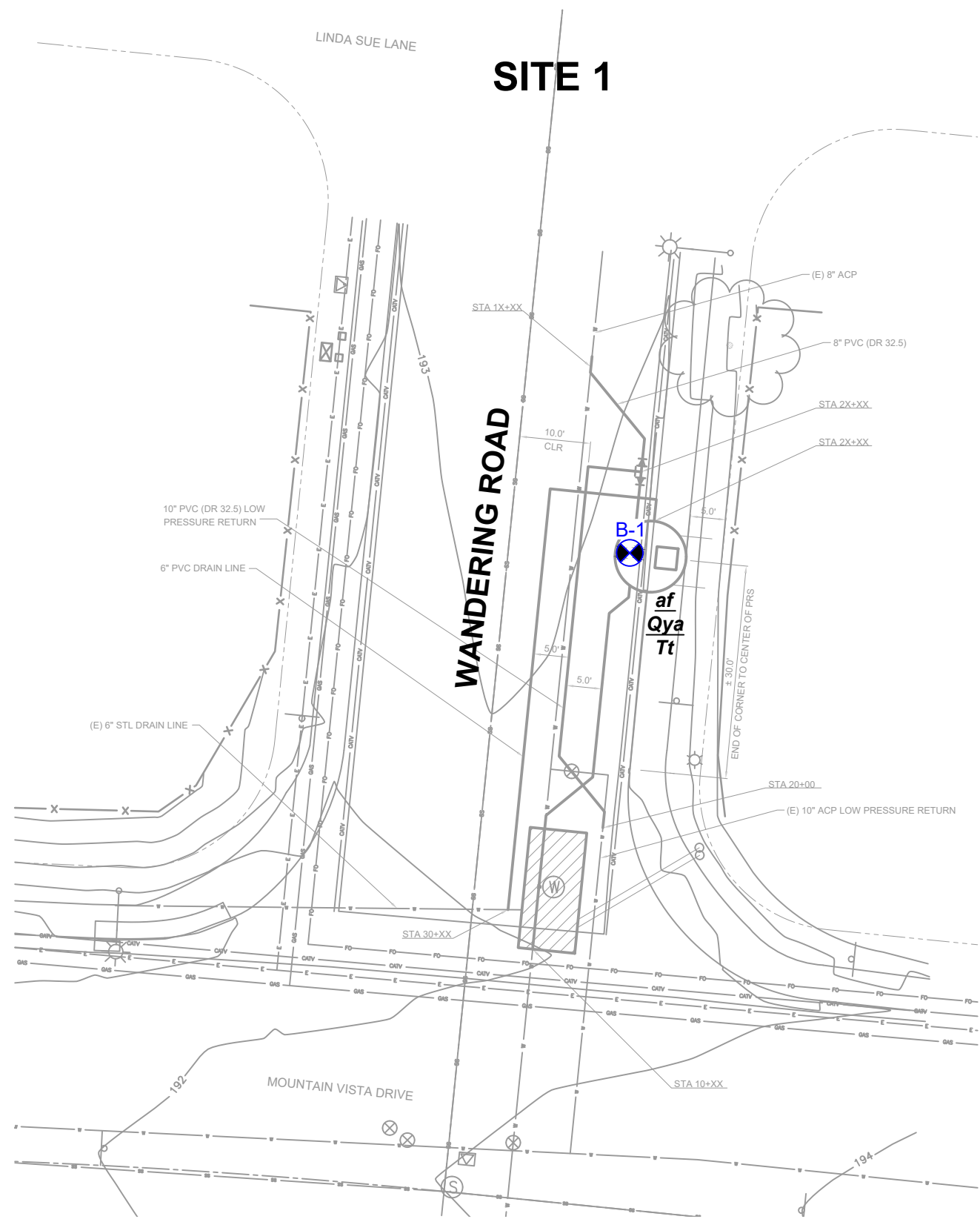


PLATE

**GARDENDALE AND VILLAGE PARK WEST
 PRS REPLACEMENTS
 MOUNTAIN VISTA DRIVE AT WANDERING ROAD AND
 GARDENDALE ROAD
 ENCINITAS, CALIFORNIA**

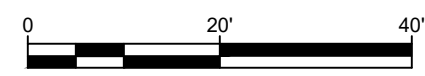
PROJECT NO.: 2022250
 DRAWN BY: DJ
 REVIEWED BY: AN
 SCALE: 1"=20'
 DRAWING TITLE:

GEOTECHNICAL MAP



KEY TO SYMBOLS

- af** FILL
- Qya** YOUNG ALLUVIAL FLOOD-PLAIN DEPOSITS
- Tt** TORREY SANDSTONE
- B-2** GEOTECHNICAL BORING





APPENDIX A

USE OF THE GEOTECHNICAL REPORT

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant: *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.



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APPENDIX B

BORING LOGS

MAJOR DIVISIONS			TYPICAL NAMES			
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVEL MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVEL WITH LESS THAN 15% FINES	GW	WELL-GRADED GRAVEL WITH OR WITHOUT SAND		
			GP	POORLY GRADED GRAVEL WITH OR WITHOUT SAND		
		GRAVEL WITH 15% OR MORE FINES	GM	SILTY GRAVEL WITH OR WITHOUT SAND		
			GC	CLAYEY GRAVEL WITH OR WITHOUT SAND		
	SAND MORE THAN HALF COARSE FRACTION IS FINER THAN NO. 4 SIEVE SIZE	CLEAN SAND WITH LESS THAN 15% FINES	SW	WELL-GRADED SAND WITH OR WITHOUT GRAVEL		
			SP	POORLY GRADED SAND WITH OR WITHOUT GRAVEL		
		SAND WITH 15% OR MORE FINES	SM	SILTY SAND WITH OR WITHOUT GRAVEL		
			SC	CLAYEY SAND WITH OR WITHOUT GRAVEL		
			FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS	ML	SILT WITH OR WITHOUT SAND OR GRAVEL
					CL	LEAN CLAY WITH OR WITHOUT SAND OR GRAVEL
OL	ORGANIC SILT OR CLAY OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL					
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%	MH	ELASTIC SILT WITH OR WITHOUT SAND OR GRAVEL				
	CH	FAT CLAY WITH OR WITHOUT SAND OR GRAVEL				
	OH	ORGANIC SILT OR CLAY OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL				
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS		

 GROUNDWATER / STABILIZED

 GROUNDWATER SEEPAGE

 BULK SAMPLE

 SPT SAMPLE (ASTM D1586)

 MOD. CAL. SAMPLE (ASTM D3550)

 UNRELIABLE BLOW COUNTS

 GEOLOGIC CONTACT

 SOIL TYPE CHANGE

LAB TEST ABBREVIATIONS

AL	ATTERBERG LIMITS
CN	CONSOLIDATION
CR	CORROSIVITY
DS	DIRECT SHEAR
EI	EXPANSION INDEX
MD	MAXIMUM DENSITY
PP	PERCENT PASSING NO.200
RV	RESISTANCE VALUE
SA	SIEVE ANALYSIS
SE	SAND EQUIVALENT

LOG ABBREVIATIONS

REF REFUSAL

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY OF COHESIONLESS SOILS		CONSISTENCY OF COHESIVE SOILS		
RELATIVE DENSITY	SPT N60 BLOWS/FOOT	CONSISTENCY	SPT N60 BLOWS/FOOT	POCKET PENETROMETER MEASUREMENT (TSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.50
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.50 - 1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).
IF THE SEATING INTERVAL (1st 6 INCH INTERVAL) IS NOT ACHIEVED, N IS REPORTED AS REF.



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SUBSURFACE EXPLORATION LEGEND

DVBE+SBE+SDVOS+SLBE

LOG OF BORING B-1

DATE DRILLED: 8/9/2023 **DRILLING EQUIPMENT:** CME 75 **SAMPLE METHOD:** HAMMER: 140 LBS., DROP: 30 IN (AUTO)
ELEVATION (FT): ± 193 **DRILLING METHOD:** HAND AUGER/HOLLOW STEM AUGER **LOGGED BY:** GN
GROUNDWATER DEPTH (FT): 7½ **NOTES:** ETR~73.9%, N₆₀ ~ $\frac{73.9}{60} \times N \sim 1.23 \times N$ **REVIEWED BY:** AN

DEPTH (FT)	BULK SAMPLE	CAL/SPT SAMPLE	BLOWS PER 6 IN N	N ₆₀	MOISTURE (%)	DRY DENSITY (pcf)	SOIL CLASS. (USCS)	SOIL DESCRIPTION <i>SUMMARY OF SUBSURFACE CONDITIONS (USCS; COLOR, MOISTURE, DENSITY, GRAIN SIZE, OTHER)</i>	LAB TESTS
0								4 IN ASPHALT CONCRETE	
0 - 5	X						SM	FILL (af): SILTY SAND; BROWN, MOIST, MEDIUM DENSE, FINE TO COARSE GRAINED, MICACEOUS	SA AL EI CR
5 - 10			3 4 2	7			SM	YOUNG ALLUVIAL FLOOD-PLAIN DEPOSITS (Qya): SILTY SAND; GRAYISH BROWN AND DARK GRAY, WET, LOOSE, FINE TO MEDIUM GRAINED, MICACEOUS, WITH DARK GRAY CLAY BLEBS GROUNDWATER ENCOUNTERED	
10 - 11			2				SC	CLAYEY SAND; GRAYISH BROWN, WET, LOOSE, FINE TO MEDIUM GRAINED, MICACEOUS	
11 - 12			2 5	9			SM	SILTY SAND; YELLOWISH BROWN, WET, LOOSE, FINE TO MEDIUM GRAINED, MICACEOUS	
15 - 20			10 22 50/3"	REF				TORREY SANDSTONE (Tt): INTERBEDDED SILTY SANDSTONE AND SANDY SILTSTONE; LIGHT GRAY AND BROWN, WET, VERY DENSE, FINE GRAINED, MICACEOUS, WEAKLY CEMENTED RED STAINING	
20 - 21			21 40 50/2"	REF					
20 - 30								BORING TERMINATED AT 20 FT. GROUNDWATER ENCOUNTERED AT 7½ FT.	



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944 Calle Amanecer, Suite F
 San Clemente, CA 92673
 P: 949.388.7710

GARDENDALE AND VILLAGE PARK WEST PRS REPLACEMENTS
 MOUNTAIN VISTA DRIVE AT WANDERING ROAD AND GARDENDALE ROAD
 ENCINITAS, CALIFORNIA

DRAFTED BY: GN

PROJECT: 2022250

APPENDIX: B.1

LOG OF BORING B-2

DATE DRILLED: 8/9/2023 **DRILLING EQUIPMENT:** CME 75 **SAMPLE METHOD:** HAMMER: 140 LBS., DROP: 30 IN (AUTO)
ELEVATION (FT): ± 243 **DRILLING METHOD:** HAND AUGER/HOLLOW STEM AUGER **LOGGED BY:** GN
GROUNDWATER DEPTH (FT): 20 **NOTES:** ETR~73.9%, N₆₀ ~ $\frac{73.9}{60}$ *N~1.23*N **REVIEWED BY:** AN

DEPTH (FT)	BULK SAMPLE	CAL/SPT SAMPLE	BLOWS PER 6 IN N	N ₆₀	MOISTURE (%)	DRY DENSITY (pcf)	SOIL CLASS. (USCS)	SOIL DESCRIPTION <i>SUMMARY OF SUBSURFACE CONDITIONS (USCS; COLOR, MOISTURE, DENSITY, GRAIN SIZE, OTHER)</i>	LAB TESTS
0								6 IN ASPHALT CONCRETE OVER 3 IN SILTY SAND (DECOMPOSED GRANITE) OVER 4 IN PULVERIZED ASPHALT CONCRETE	
0 - 5			6				SM	FILL (af): SILTY SAND; DARK YELLOWISH BROWN AND LIGHT OLIVE BROWN, MOIST, MEDIUM DENSE, FINE TO COARSE GRAINED, MICACEOUS DARK GRAYISH BROWN, YELLOWISH GRAY AND DARK GRAYISH BROWN, ROOTS	SA EI
5 - 10			10 11	26			SC	CLAYEY SAND; DARK GRAYISH BROWN, MOIST, MEDIUM DENSE, FINE TO MEDIUM GRAINED, MICACEOUS YELLOWISH GRAY, FINE TO COARSE GRAINED	SA AL CR
10 - 15			9 9 10	23				LIGHT GRAYISH BROWN, WITH ORANGE STAINING GRAYISH BROWN AND YELLOWISH BROWN	
15 - 20			9 13 12	31			SM	SILTY SAND; GRAYISH BROWN, MOIST, DENSE, FINE TO MEDIUM GRAINED, SLIGHTLY MICACEOUS, YELLOWISH BROWN, WITH RED STAINING MOTTLED LIGHT GRAY AND DARK GRAYISH BROWN	
20 - 21			4 6 5	14			SC	YOUNG ALLUVIAL FLOOD-PLAIN DEPOSITS (Qya): CLAYEY SAND; DARK GRAYISH BROWN, MOIST, MEDIUM DENSE, FINE TO MEDIUM GRAINED, MICACEOUS MOTTLED DARK GRAY AND DARK GRAYISH BROWN, GROUNDWATER ENCOUNTERED	
21 - 25			7 9 10	23			SM	SILTY SAND; GRAYISH BROWN, WET, MEDIUM DENSE, FINE TO MEDIUM GRAINED, DARK YELLOWISH BROWN	PP
25 - 26.5			10 9 9	22				LIGHT OLIVE BROWN, MINOR RED STAINING	PP
26.5 - 30								BORING TERMINATED AT 26½ FT. GROUNDWATER ENCOUNTERED AT 20 FT.	



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GARDENDALE AND VILLAGE PARK WEST PRS REPLACEMENTS

MOUNTAIN VISTA DRIVE AT WANDERING ROAD AND GARDENDALE ROAD
 ENCINITAS, CALIFORNIA

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 San Diego, CA 92123
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944 Calle Amanecer, Suite F
 San Clemente, CA 92673
 P: 949.388.7710

DRAFTED BY: GN

PROJECT: 2022250

APPENDIX: B.2



APPENDIX C

LABORATORY TESTING

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. Brief descriptions of the tests performed are presented below:

- **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soils Classification System and are presented on the exploration logs in Appendix B.
- **GRADATION ANALYSIS (ASTM D6913):** Gradation analyses were performed on representative soil samples in general accordance with ASTM D422. The grain size distributions of the samples were determined in accordance with ASTM D6913.
- **ATTERBERG LIMITS (ASTM D4318):** Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limits, plastic limits, and plasticity indexes in general accordance with ASTM D4318. These test results were utilized to evaluate the soil classification in accordance with the Unified Soil Classification System.
- **AMOUNT OF MATERIAL FINER THAN NO. 200 SIEVE (ASTM D1140):** Specimens of soil were washed over a No. 200 sieve. Clay and other particles that are dispersed by the washwater are removed during the test. The loss in mass resulting from the wash treatment is calculated as mass percent of the original sample and is reported as the percentage of material finer than a No. 200 sieve by washing.
- **EXPANSION INDEX (ASTM D4829):** The expansion indexes of selected materials were evaluated in general accordance with ASTM D4829. The specimens were molded under a specified compactive energy at approximately 50 percent saturation (plus or minus 1 percent). The prepared 1-inch thick by 4-inch diameter specimens were loaded with a surcharge of 144 pounds per square foot and were inundated with distilled water. Readings of volumetric swell were made for a period of 24 hours.
- **CORROSIVITY TEST (CAL. TEST METHOD 417, 422, 643):** Soil pH and minimum resistivity tests were performed on representative soil samples in general accordance with test method CT 643. The sulfate and chloride contents of the selected samples were evaluated in general accordance with CT 417 and CT 422, respectively.

Soil samples not tested are now stored in our laboratory for future reference and evaluation, if needed. Unless notified to the contrary, samples will be disposed of 60 days from the date of this report.



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LAB TEST SUMMARY

GARDENDALE AND VILLAGE PARK WEST PRS REPLACEMENTS

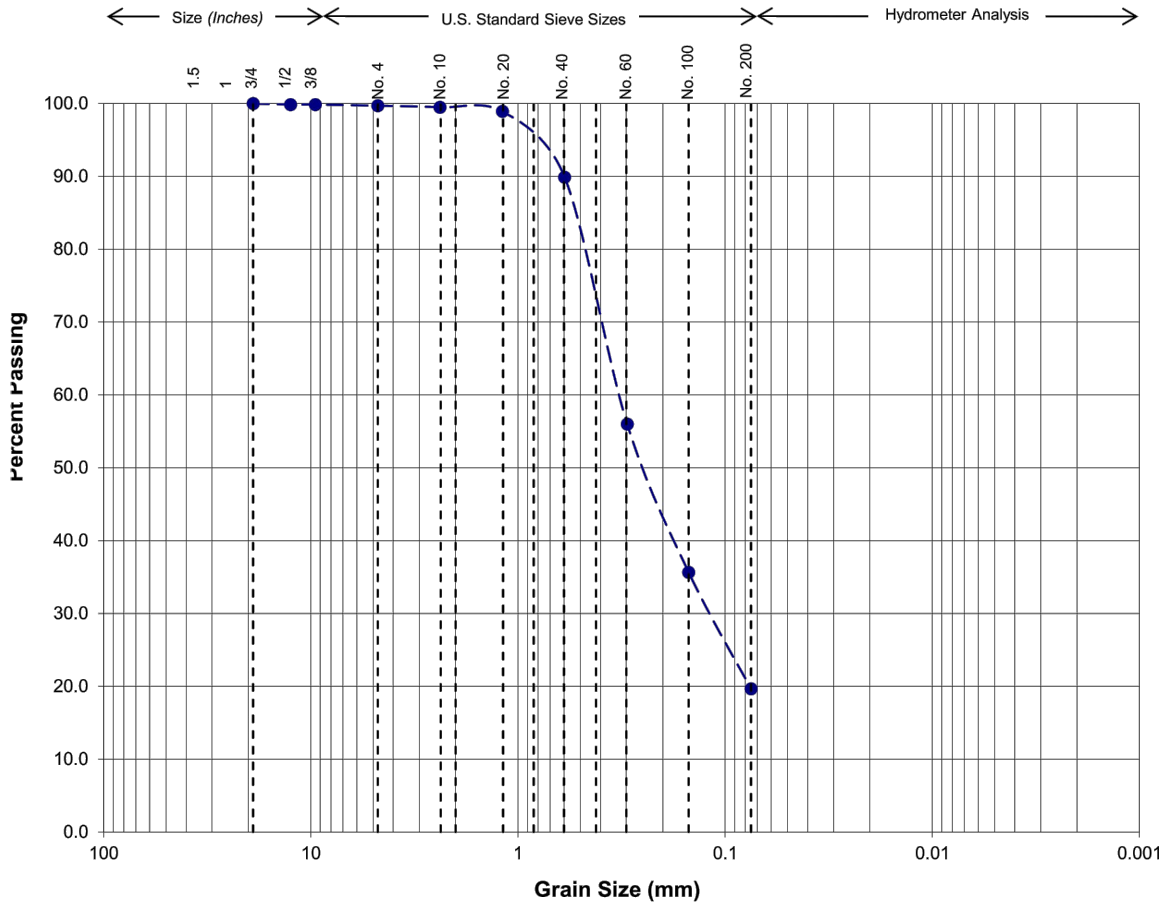
MOUNTAIN VISTA DRIVE AT WANDERING ROAD AND GARDENDALE ROAD
ENCINITAS, CALIFORNIA

BY: GN

REVIEWED BY: AN/GD

PROJECT: 2022250

FIGURE: C.1



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample Location:	B-1	<u>Atterberg Limits (ASTM D4318):</u>
Depth (ft):	1 - 5	Liquid Limit, LL: NP
USCS Soil Type:	SM	Plastic Limit, PL: NP
Passing No. 200 (%):	20	Plasticity Index, PI: NP



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CLASSIFICATION TEST RESULTS

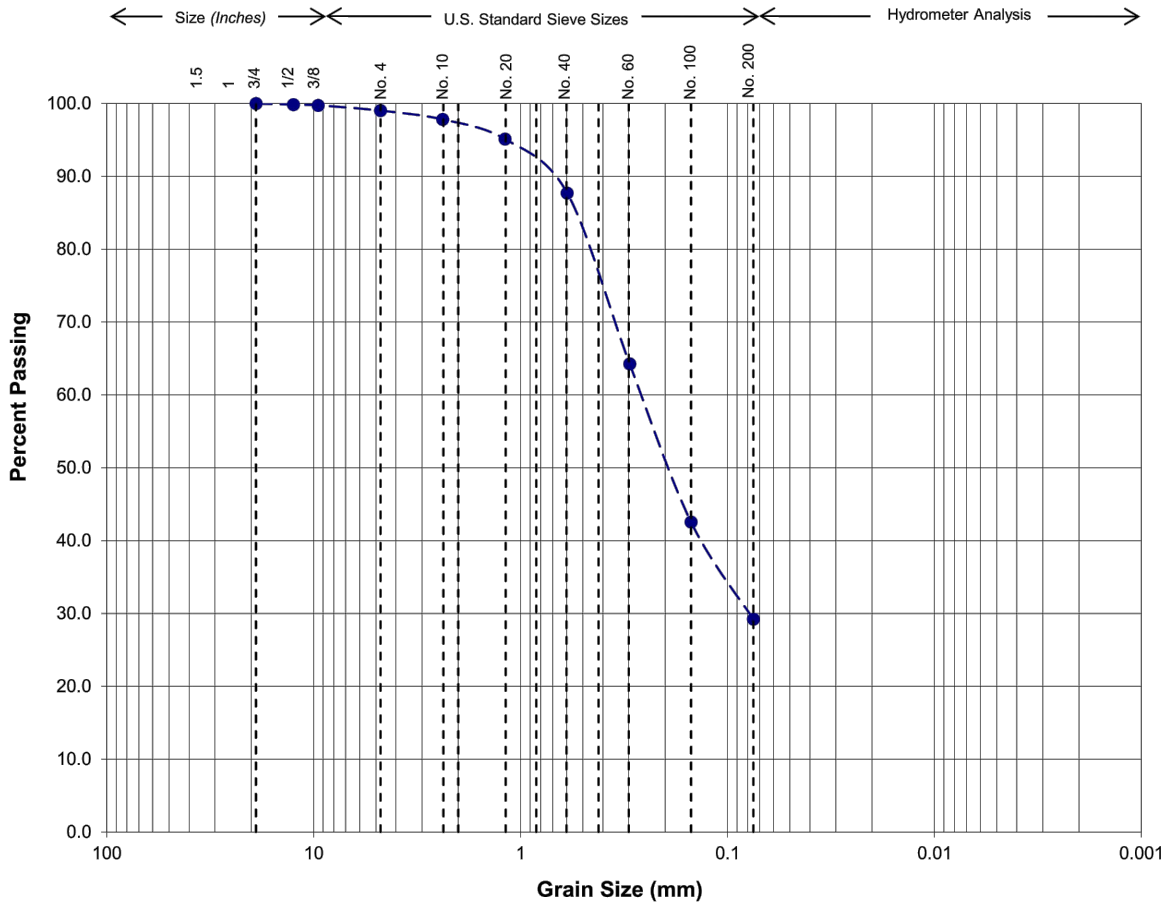
GARDENDALE AND VILLAGE PARK WEST PRS REPLACEMENTS
MOUNTAIN VISTA DRIVE AT WANDERING ROAD AND GARDENDALE ROAD
ENCINITAS, CALIFORNIA

BY: GN

REVIEWED BY: AN/GD

PROJECT: 2022250

FIGURE: C.2



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample Location: B-2
 Depth (ft): 1 - 4
 USCS Soil Type: SM
 Passing No. 200 (%): 29



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CLASSIFICATION TEST RESULTS

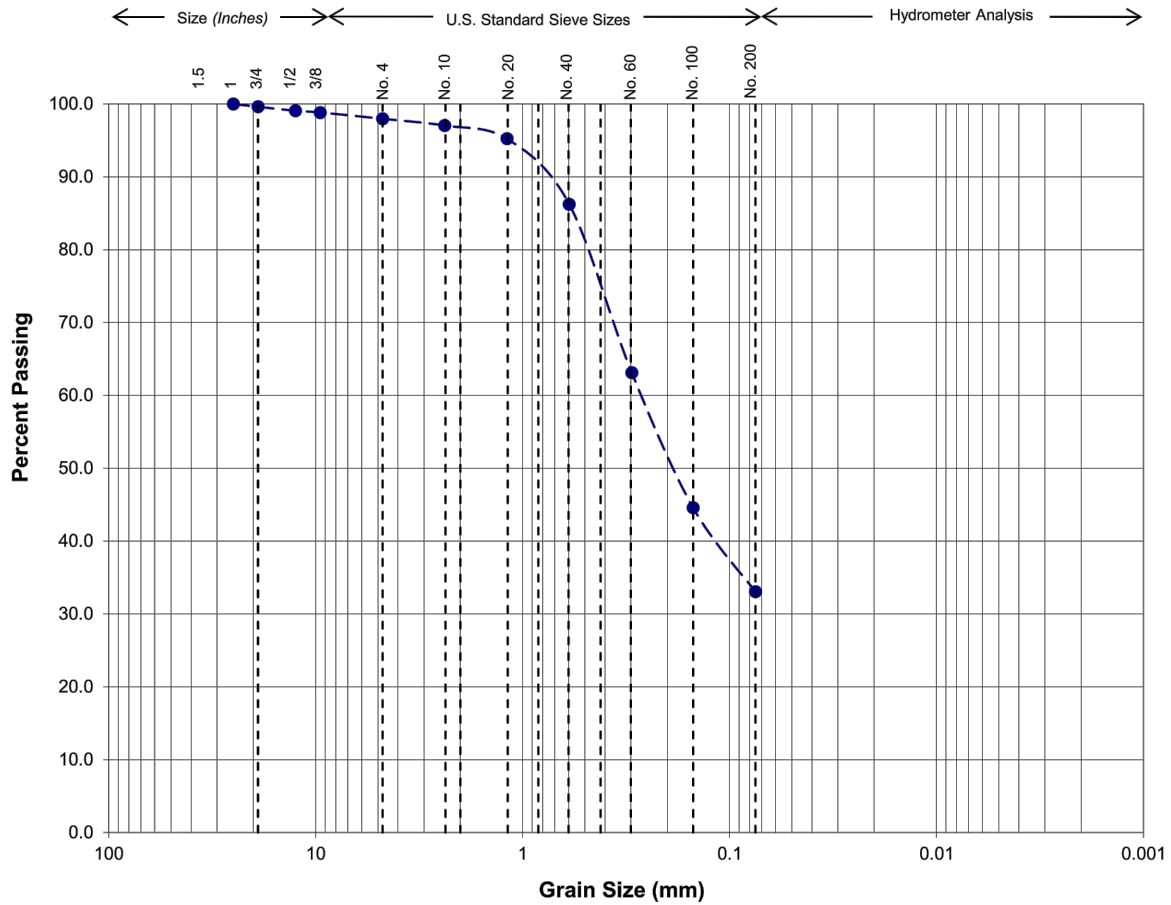
GARDENDALE AND VILLAGE PARK WEST PRS REPLACEMENTS
 MOUNTAIN VISTA DRIVE AT WANDERING ROAD AND GARDENDALE ROAD
 ENCINITAS, CALIFORNIA

BY: GN

REVIEWED BY: AN/GD

PROJECT: 2022250

FIGURE: C.3



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample Location:	B-2	<u>Atterberg Limits (ASTM D4318):</u>
Depth (ft):	7 - 10	Liquid Limit, LL: 27
USCS Soil Type:	SC	Plastic Limit, PL: 18
Passing No. 200 (%):	33	Plasticity Index, PI: 9



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CLASSIFICATION TEST RESULTS

GARDENDALE AND VILLAGE PARK WEST PRS REPLACEMENTS
MOUNTAIN VISTA DRIVE AT WANDERING ROAD AND GARDENDALE ROAD
ENCINITAS, CALIFORNIA

BY: GN

REVIEWED BY: AN/GD

PROJECT: 2022250

FIGURE: C.4

Percent Passing No. 200 (ASTM D4829)

Sample Location	Sample Depth (ft.)	Percent Passing No. 200 Sieve
B-2	20 - 21½	24
B-2	25 - 26½	17

Expansion Index (ASTM D4829)

Sample Location	Sample Depth (ft.)	Expansion Index	Expansion Potential
B-1	1 - 5	0	Very Low
B-2	1 - 4	2	Very Low

Classification of Expansive Soil (ASTM D4829)

Expansion Index	Expansion Potential
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

Corrosivity (Cal. Test Method 417,422,643)

Sample Location	Sample Depth (ft.)	pH	Resistivity (Ohm-cm)	Sulfate Content (ppm)	Sulfate Content (%)	Chloride Content (ppm)	Chloride Content (%)
B-1	1 - 5	7.1	1706	45	0.005	117	0.012
B-2	7 - 10	5.1	2161	27	0.003	107	0.011

Water-Soluble Sulfate Exposure (ACI 318 Table 19.3.1.1 and Table 19.3.2.1)

Water-Soluble Sulfate (SO ₄) in Soil (% by Weight)	Exposure Severity	Exposure Class	Cement Type (ASTM C150)	Max. W/C	Min. f _c ' (psi)
SO ₄ < 0.10	N/A	S0	No type restriction	N/A	2,500
0.10 ≤ SO ₄ < 0.20	Moderate	S1	II	0.50	4,000
0.20 ≤ SO ₄ ≤ 0.20	Severe	S2	V	0.45	4,500
SO ₄ > 2.00	Very Severe	S3	V plus pozzolan or slag cement	0.45	4,500

LAB TEST RESULTS

GARDENDALE AND VILLAGE PARK WEST PRS REPLACEMENTS

MOUNTAIN VISTA DRIVE AT WANDERING ROAD AND GARDENDALE ROAD
ENCINITAS, CALIFORNIA

BY: GN

REVIEWED BY: AN/GD

PROJECT: 2022250

FIGURE: C.5



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APPENDIX B:
POTHOLING
REPORT

Balboa Engineering, Inc.
Gardendale & Park West PRS Project
Subsurface Utility Report
October 2, 2023



UNDERGROUND SOLUTIONS





October 2, 2023

Mr. Matt Dorman, PE
Balboa Engineering, Inc.
14204 Caminito Lanza
San Diego, CA 92127

Dear Mr. Dorman:

I would like to take this opportunity to personally thank you for putting your trust in Underground Solutions, Inc. to perform the utility locating on this project. Over the last 20 years USI has prided itself on being the potholing company of choice of our clients, we have a 99% repeat customer base. Your opinion matters to us. We welcome any comments or suggestions that will help us improve our service and keep you coming back.

The following proprietary report details our findings for the pothole locations identified by your company, complete with photographs of individual utilities found during our investigation. Underground Solutions' mission statement has never changed; we strive to provide the most professional and accurate state-of-the-art service. This is achieved by our top of the line equipment and professional field team.

Once again, thank you for this opportunity and we look forward to a continued working relationship with you and your firm!

Sincerely,

Michael E Arme
President
Underground Solutions, Inc.



Your First Choice For Potholing Services

120 N. Andreasen Dr., Escondido, CA 92029 Ph# 760/ 294-9449 Fax# 760/ 294-9490



Table of Contents

- Pothole Summary Sheet(s)
- Area Map(s) / Pothole Exhibit
- Pothole Report
- Data and Photo Logs
- Traffic Control Plans (if applicable)
- Picture Thumbnails
- Legends



POTHOLE SUMMARY SHEET(S)



Underground Solutions, Inc.
 120 N. Andreasen Dr. Escondido, CA 92029
 (760) 294-9449 • Fax (760) 294-9490 • www.usipothole.com

Pothole Summary Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 04, 2023

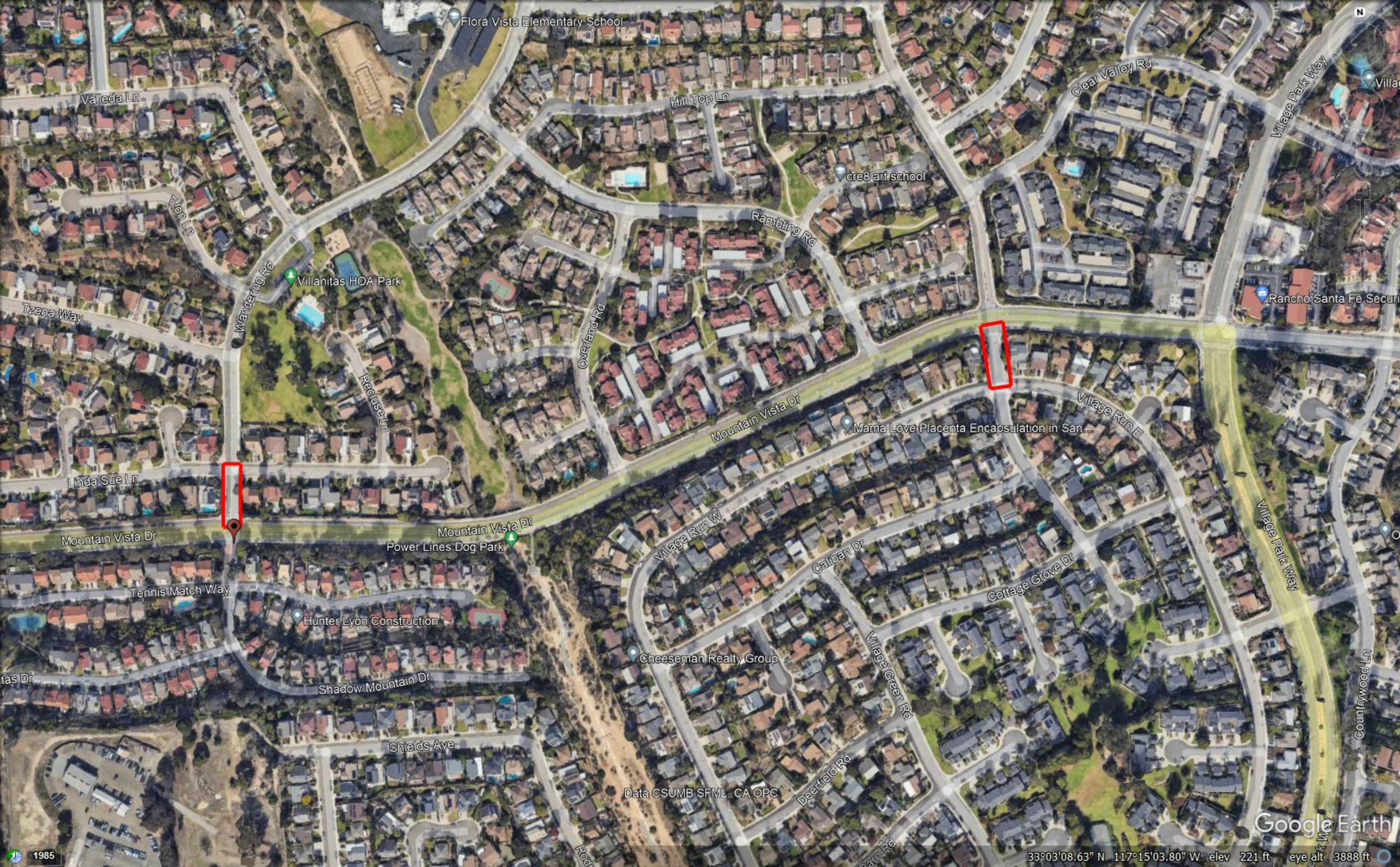
PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
01		Dry Hole	0.00	0.00		N/A	6.60 ft W of curb face, 6.40 ft NE of W/MH, 67.86 ft E of STLT	Unknown
02		Dry Hole	0.00	0.00		N/A	9.40 ft W of curb face, 36.40 ft E of transformer, 62.20 ft S of S/MH	Unknown
03		W	4.34	0.00	UNK	CONC	59.20 ft E of SD, 76.00 ft W of SDG&E vault, 29.60 ft N of S/MH	N/S
03		UNK	3.20	3.80	1.5" (2ea), 0.75" (1ea), 0.5" (1ea)	DB	59.00 ft E of SD, 77.60 ft W of SDG&E vault, 28.80 ft N of S/MH	E/W
04		W	8.80	0.00	UNK	CONC	2.80 ft W of curb face, 5.20 ft E of W/valve, 17.80 ft N of W/MH	E/W
05		W	5.12	6.00	6"	STL	21.00 ft E of curb face, 18.00 ft W of curb face, 71.00 ft S of S/MH	E/W
06		W	7.60	0.00	UNK	UNK	30.00 ft E of curb face, 19.20 ft W of E/box, 11.40 ft N of W/MH	N/S
07		W	8.90	0.00	UNK	UNK	11.00 ft W of curb face, 29.00 ft E of curb face, 30.00 ft S of W/MH	N/S
08		G	3.04	3.38	3"	PE	4.40 ft W of curb face, 35.00 ft E of curb face, 20.20 ft S of W/MH	N/S



UNDERGROUND SOLUTIONS



AREA MAP(S) / POTHOLE EXHIBIT



Flora Vista Elementary School

Valleda Ln

Hill Top Ln

Clear Valley Rd

Village Park Way

Elon Ln

Villanitas HOA Park

cre8 art school

Rambling Rd

Tzena Way

Wandering Rd

Overland Rd

Rancho Santa Fe Secur

Recluse Ln

Mountain Vista Dr

Mama Love Placenta Encapsulation in San...

Village Run E

Linda Sue Ln

Mountain Vista Dr

Mountain Vista Dr
Power Lines Dog Park

Village Run W

Galiban Dr

Cottage Grove Dr

Tennis Match Way

Hunter Lyon Construction

Cheeseman Realty Group

Shadow Mountain Dr

Village Green Rd

Countrywood Ln

tas Dr

Shields Ave

Data CSUMB SFML, CA OPC

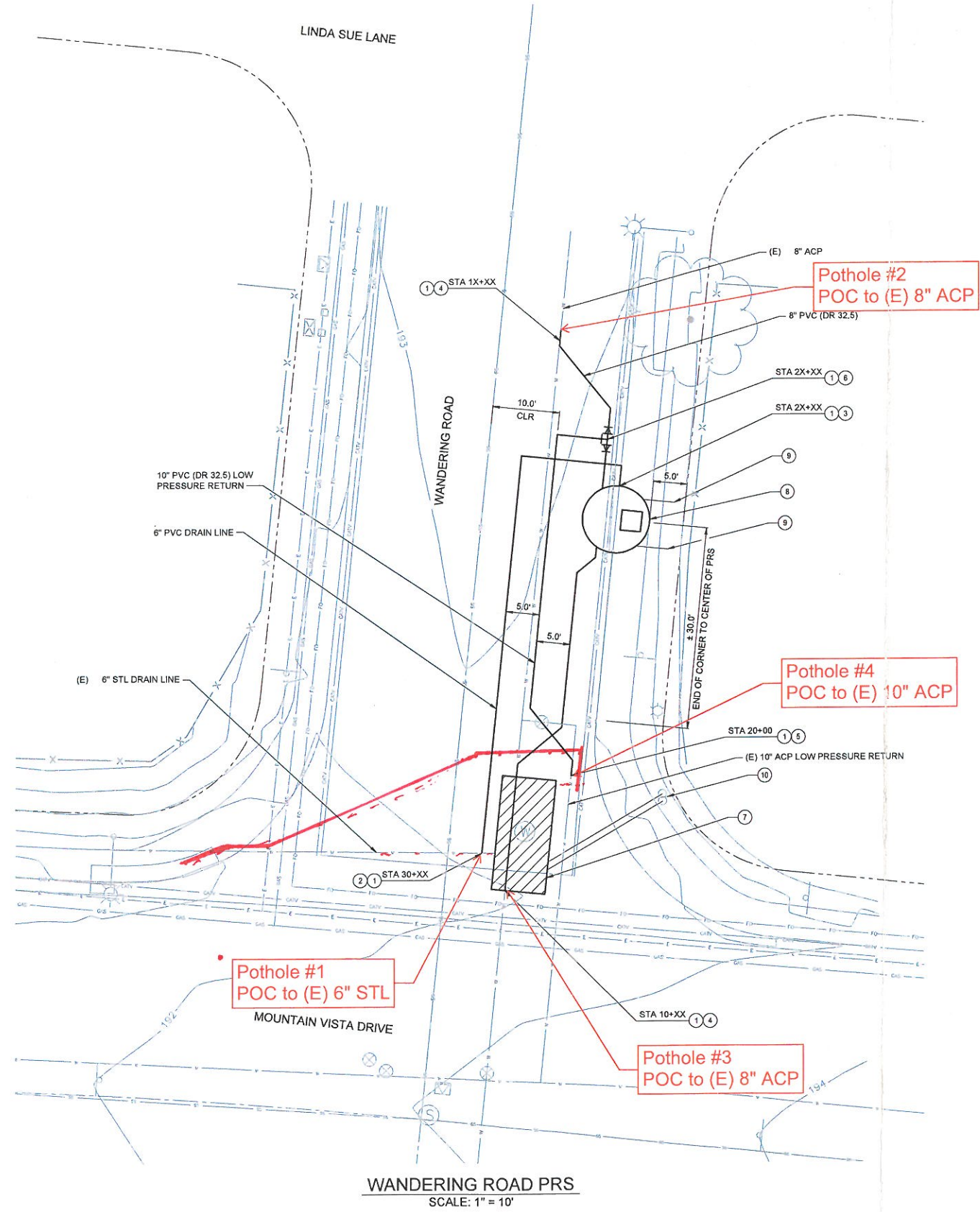
Deerfield Rd

Google Earth

1985

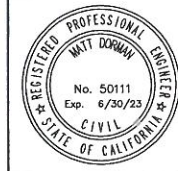
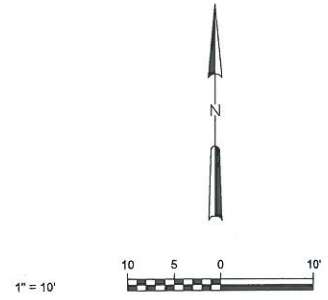
33°03'08.63" N 117°15'03.80" W elev 221 ft eye alt 3888 ft

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CONSTRUCTION NOTES

- ① JOINT RESTRAINT ASSEMBLY PER OMWD APPROVED MATERIALS LIST. FIELD VERIFY ALL CONNECTION POINT DEPTHS, SLOPES, AND O.D. PRIOR TO ORDERING MATERIALS.
- ② CONNECT TO EXISTING 6" STEEL RELIEF PIPE, SEE SHEET C-X, DETAIL X
- ③ CONNECT TO 6" PRS RELIEF OUTLET
- ④ CONNECT TO EXISTING 8" ACP, SEE SHEET X, DETAIL X
- ⑤ CONNECT TO EXISTING 10" ACP, SEE SHEET X, DETAIL X
- ⑥ CONNECT TO NEW 10" PVC WITH 10" GV, 10"x10"x10" TEE, AND TWO 8"x10" REDUCERS. SEE SHEET X, DETAIL X
- ⑦ DEMOLISH EXISTING PRS BY REMOVING AND DISPOSING OF EXISTING UPPER THREE FEET OF VAULT. BREAK OR DRILL VAULT BOTTOM FOR DRAINAGE. FILL VAULT WITH SAND OR 1-SACK SAND/CEMENT SLURRY AND COMPACT PER SPECIFICATIONS.
- ⑧ EFI PRS. SEE DWG NO P-519802-F2-001
- ⑨ 4" VENT PIPE, SEE SHEET X, DETAIL X
- ⑩ DEMOLISH EXISTING VENT PIPING AS NEEDED AND TO TWO FEET BELOW FINISH GRADE. REPLACE SECTION OF CURB AND GUTTER REMOVED DURING DEMOLITION TO MATCH EXISTING



GARDENDALE AND VILLAGE PARK WEST
PRS REPLACEMENTS

WANDERING ROAD
10" WATER LINE IMPROVEMENTS

SHEET 4 OF XX
DRAWING C-1

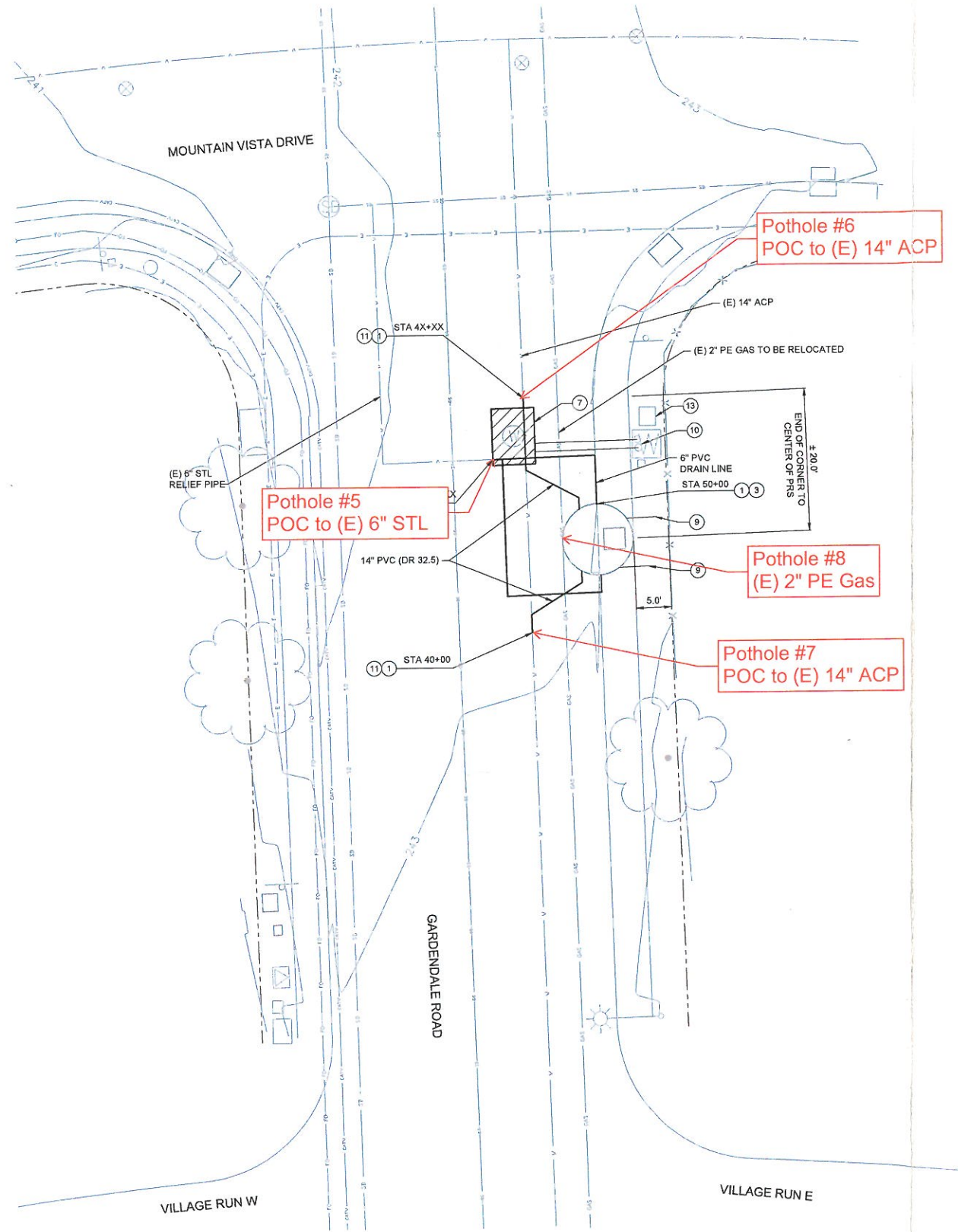
OLIVENHAIN
Municipal Water District
1966 Olivenhain Road
Encinitas, CA 92024 (760)753-6466

BALBOA
ENGINEERING, INC.

DESIGN	DRAWN	CHECK	MARK	DATE	BY

ORIGINAL SCALE IN INCHES 0 1 2 3 4

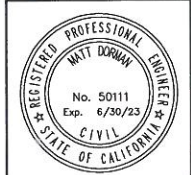
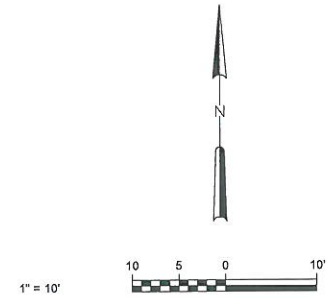
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GARDENDALE ROAD PRS
SCALE: 1" = 10'

CONSTRUCTION NOTES

- ① JOINT RESTRAINT ASSEMBLY PER OMWD APPROVED MATERIALS LIST. FIELD VERIFY ALL CONNECTION POINT DEPTHS, SLOPES, AND O.D. PRIOR TO ORDERING MATERIALS.
- ③ CONNECT TO 6" PRS RELIEF OUTLET
- ⑦ DEMOLISH EXISTING PRS BY REMOVING AND DISPOSING OF EXISTING UPPER THREE FEET OF VAULT. BREAK OR DRILL VAULT BOTTOM FOR DRAINAGE. VILL VAULT WITH SAND OR 1-SACK SAND/CEMENT SLURRY AND COMPACT PER SPECIFICATIONS.
- ⑧ EFI PRS, SEE DWG NO P-519802-F2-001
- ⑨ 4" VENT PIPE, SEE SHEET X, DETAIL X
- ⑩ DEMOLISH EXISTING VENT PIPING AS NEEDED AND TO TWO FEET BELOW FINISH GRADE. REPLACE SECTION OF CURB AND GUTTER REMOVED DURING DEMOLITION TO MATCH EXISTING
- ⑪ CONNECT TO EXISTING 14" ACP, SEE SHEET X, DETAIL X
- ⑫ CONNECT TO EXISTING 6" STEEL RELIEF PIPE, SEE SHEET C-X, DETAIL XX
- ⑬ DEMOLISH EXISTING SCADA PANEL. PROTECT EXISTING ANTENNA POLE IN PLACE.



GARDENDALE AND VILLAGE PARK WEST PRS REPLACEMENTS	
GARDENDALE ROAD 14" WATER LINE IMPROVEMENTS	
SHEET 5 OF XX	DRAWING C-2

OLIVENHAIN
Municipal Water District
1966 Olivenhain Road
Encinitas, CA 92024 (760)753-6466

BALBOA
ENGINEERING, INC.

DESIGN	DRAWN	CHECK	MARK	DATE	BY	REVISIONS

ORIGINAL SCALE IN INCHES 6 3 1 4



UNDERGROUND SOLUTIONS



POTHOLE REPORT



Underground Solutions, Inc.
 120 N. Andreasen Dr. Escondido, CA 92029
 (760) 294-9449 • Fax (760) 294-9490 • www.usipothole.com

Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
01		Dry Hole	0.00	0.00		N/A		Unknown

Comments: No W found to 6.0 ft. PH located 6.6 ft W of curb face, 6.4 ft NE of W/MH, 67.86 ft E of STLT

Operator:	Valdez, Adrian	Technician:	Robles, Michael	Vehicle:	USI 6
Field Log #:	19490	Log Date:	09/14/2023	Soil Type:	DG
Asphalt Depth:	0.60	Concrete Depth:	0	Marker:	PK Nail

Pre-Excavation Photo



Subsurface Photo



The data on this report is intended for informational purposes only. In no way should any of the information presented here be a substitute for professional engineering and design.



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Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 01

Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo



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Location	Encinitas, CA
Date	October 03, 2023

PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
02		Dry Hole	0.00	0.00		N/A		Unknown

Comments: No W found to 6.0 ft. PH located 9.4 ft W of curb face, 36.4 ft E of transformer, 62.2 ft S of S/MH

Operator:	Valdez, Adrian	Technician:	Robles, Michael	Vehicle:	USI 6
Field Log #:	19490	Log Date:	09/14/2023	Soil Type:	DG
Asphalt Depth:	0.60	Concrete Depth:	0	Marker:	Paint

Pre-Excavation Photo



Subsurface Photo



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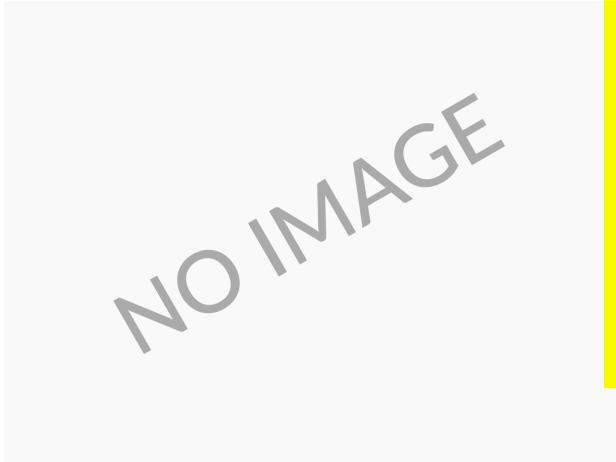
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Subsurface Utility Report

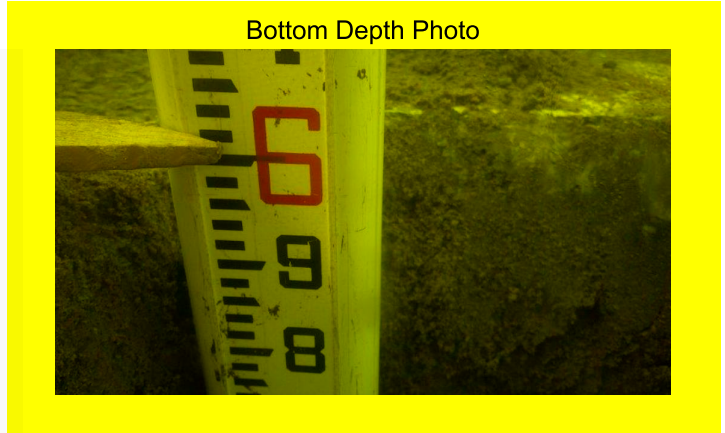
Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 02

Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo



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Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
03		W	4.34	0.00	UNK	CONC	59.20 ft E of SD, 76.00 ft W of SDG&E vault, 29.60 ft N of S/MH	N/S

Comments					
Operator:	Valdez, Adrian	Technician:	Robles, Michael	Vehicle:	USI 6
Field Log #:	19490	Log Date:	09/14/2023	Soil Type:	DG
Asphalt Depth:	0.60	Concrete Depth:	0	Marker:	PK Nail

Pre-Excavation Photo



Subsurface Photo



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Subsurface Utility Report

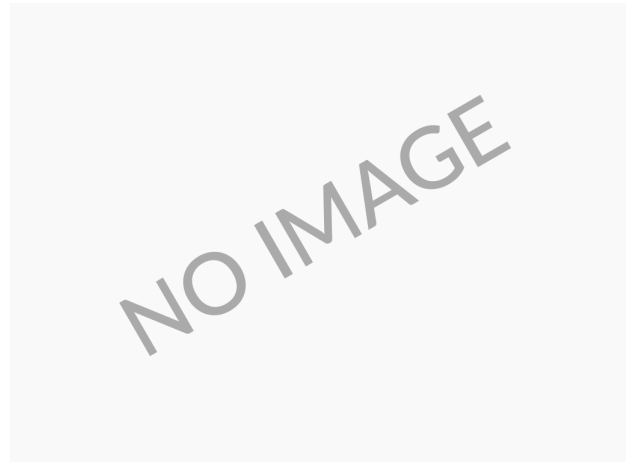
Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 03

Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo



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Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
03		UNK	3.20	3.80	1.5" (2ea), 0.75" (1ea), 0.5" (1ea)	DB	59.00 ft E of SD, 77.60 ft W of SDG&E vault, 28.80 ft N of S/MH	E/W

Comments					
Operator:	Valdez, Adrian	Technician:	Robles, Michael	Vehicle:	USI 6
Field Log #:	19490	Log Date:	09/14/2023	Soil Type:	DG
Asphalt Depth:	0.60	Concrete Depth:	0	Marker:	PK Nail

Pre-Excavation Photo



Subsurface Photo



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Subsurface Utility Report

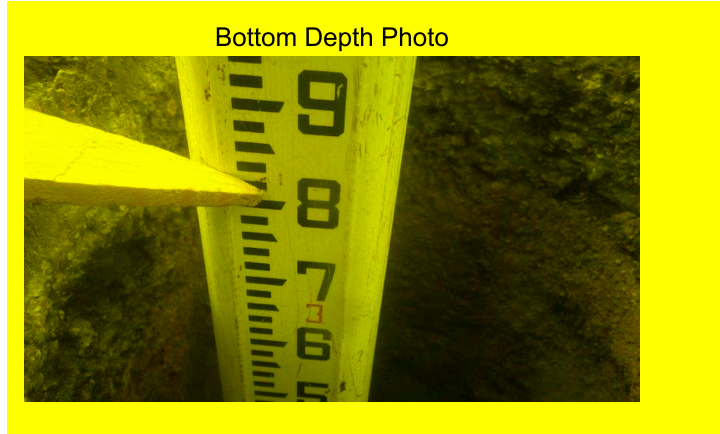
Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 03

Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo



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Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
04		W	8.80	0.00	UNK	CONC	2.80 ft W of curb face, 5.20 ft E of W/valve, 17.80 ft N of W/MH	E/W

Comments	Top of CONC thrust block.				
Operator:	Valdez, Adrian	Technician:	Robles, Michael	Vehicle:	USI 6
Field Log #:	19475	Log Date:	09/14/2023	Soil Type:	DG
Asphalt Depth:	0.60	Concrete Depth:	0	Marker:	PK Nail

Pre-Excavation Photo



Subsurface Photo



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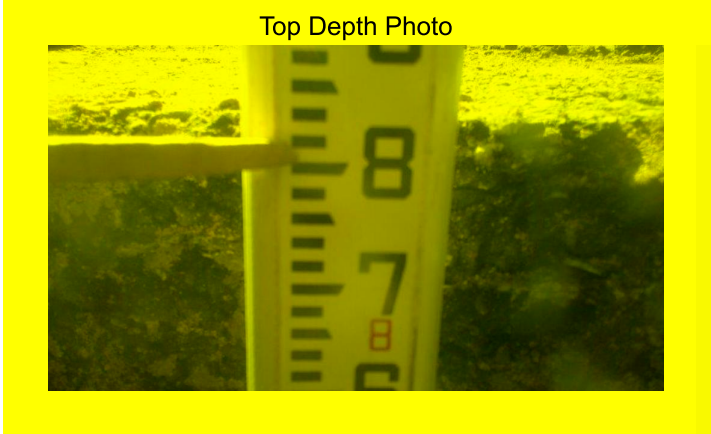
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Subsurface Utility Report

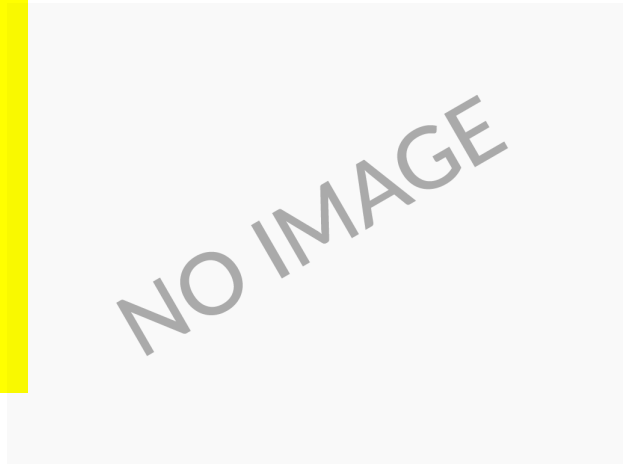
Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 04

Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo



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Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
05		W	5.12	6.00	6"	STL	21.00 ft E of curb face, 18.00 ft W of curb face, 71.00 ft S of S/MH	E/W

Comments	10" OD - 6" mark-out				
Operator:	Valdez JR, Manuel	Technician:	Valdez, Gabriel	Vehicle:	USI 3
Field Log #:	19521	Log Date:	09/19/2023	Soil Type:	Clay
Asphalt Depth:	0.50	Concrete Depth:	0	Marker:	PK Nail

Pre-Excavation Photo



Subsurface Photo



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Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 05

Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo



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Subsurface Utility Report

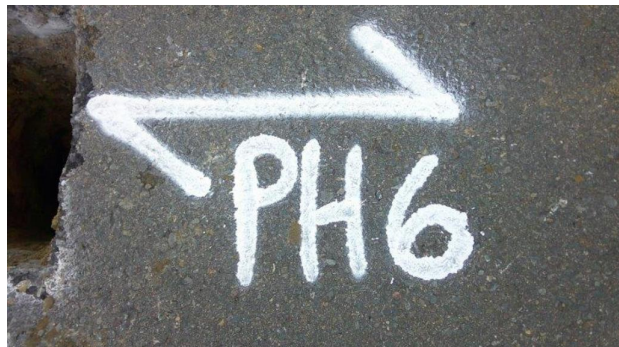
Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
06		W	7.60	0.00	UNK	UNK	30.00 ft E of curb face, 19.20 ft W of E/box, 11.40 ft N of W/MH	N/S

Comments: Unable to expose due to ground water. Top depth taken by probe.

Operator:	Valdez JR, Manuel	Technician:	Valdez, Gabriel	Vehicle:	USI 3
Field Log #:	19521	Log Date:	09/19/2023	Soil Type:	Sand
Asphalt Depth:	0.50	Concrete Depth:	0	Marker:	PK Nail

Pre-Excavation Photo



Subsurface Photo



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Subsurface Utility Report

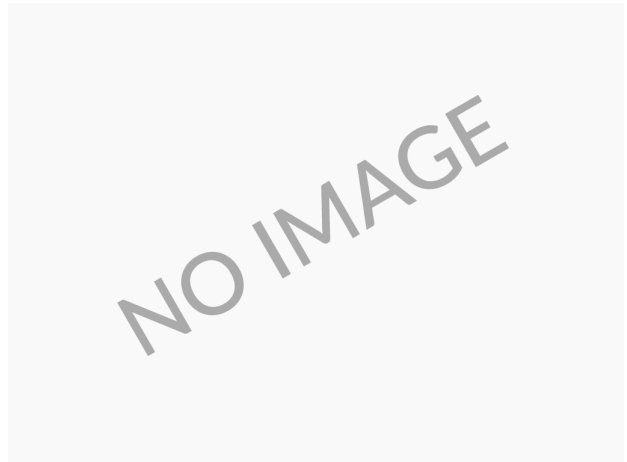
Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 06

Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo



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Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
07		W	8.90	0.00	UNK	UNK	11.00 ft W of curb face, 29.00 ft E of curb face, 30.00 ft S of W/MH	N/S

Comments	Unable to expose due to ground water. Top depth taken by probe.				
Operator:	Valdez JR, Manuel	Technician:	Valdez, Gabriel	Vehicle:	USI 3
Field Log #:	19521	Log Date:	09/19/2023	Soil Type:	Sand
Asphalt Depth:	0.50	Concrete Depth:	0	Marker:	PK Nail

Pre-Excavation Photo



Subsurface Photo



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Subsurface Utility Report

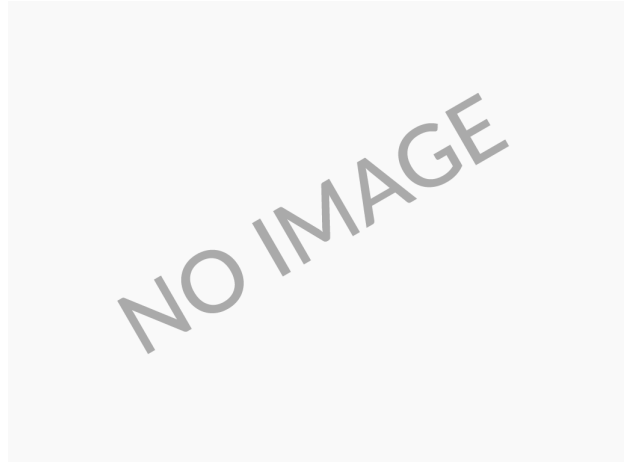
Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 07

Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo



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Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

PH#	Station	Utility	Top (ft)	Bottom (ft)	Size	Type	Distance From Curb	Direction
08		G	3.04	3.38	3"	PE	4.40 ft W of curb face, 35.00 ft E of curb face, 20.20 ft S of W/MH	N/S

Comments					
Operator:	Valdez JR, Manuel	Technician:	Valdez, Gabriel	Vehicle:	USI 3
Field Log #:	19521	Log Date:	09/19/2023	Soil Type:	Sand
Asphalt Depth:	0.50	Concrete Depth:	0	Marker:	PK Nail

Pre-Excavation Photo



Subsurface Photo



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Subsurface Utility Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 08

Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo



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DATA & PHOTO LOGS



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Date: 9-14-23

REPORT DATA AND PHOTO LOG

No 019490

Vac Truck#: 6

Customer: Balboa ENG

Technicians: Adrian V. Mike R

Project Name: Gardendale

Location: Encinitas

POTHOLE #	Soil Type:	Asphalt Depth:	Concrete Depth:	Marker:	Physical Tie-Back Information:	Distance (ft)	Direction	FROM EXISTING
#3	Dg	0 ⁶⁰	-	PK				
Station #	Pre-Exc. Photo # 0001	Area Photo # (Facing North) 0012	Slot Trench: Width - x Length - x Depth -		No. 1	59 ²⁰	E	Storm CURB FACE DRAIN
Utility: W	Material Type: concrete	Size: -	Top Depth: 434	Bottom Depth: -	Comments:	No. 2	76 ⁰⁰ W	EDGE VAULT
Subsurface Photo #: 0004	Depth Photo (T) #: 0007	Depth Photo (B) #: -	Finish Photo #: 0009	Utility Direction: N, S		No. 3	29 ⁶⁰	N SMH
3	Dg	0 ⁶⁰	-	PK				
Station #	Pre-Exc. Photo # 0008	Area Photo # (Facing North) 0011	Slot Trench: Width - x Length - x Depth -		No. 1	59 ⁰⁰	E	Storm CURB FACE DRAIN
Utility: UNK	Material Type: DB	Size: (2) 1 1/2 (1) 3/4 (1) 1 1/2	Top Depth: 320	Bottom Depth: 380	Comments: Conduits NOT MARKED OUT. (2) 1 1/2 (1) 3/4 (1) 1 1/2	No. 2	77 ⁶⁰	W EDGE VAULT
Subsurface Photo #: 0002	Depth Photo (T) #: 0005	Depth Photo (B) #: 0006	Finish Photo #: 0010	Utility Direction: E, W		No. 3	28 ⁸⁰	N SMH
2	Dg / clay	0 ⁶⁰	-	PK				
Station #	Pre-Exc. Photo # 0013	Area Photo # (Facing North) 0017	Slot Trench: Width - x Length - x Depth -		No. 1	940	W	CURB FACE
Utility: UNK W	Material Type: -	Size: -	Top Depth: -	Bottom Depth: 6 ⁰⁰	Comments: Cleared 6 ⁰⁰ E, W	No. 2	36 ⁴⁰	E transformer
Subsurface Photo #: 0014	Depth Photo (T) #: -	Depth Photo (B) #: 0015	Finish Photo #: 0016	Utility Direction: -		No. 3	62 ²⁰	S SMH
1	Dg / clay	0 ⁶⁰	-	PK				
Station #	Pre-Exc. Photo # 0018	Area Photo # (Facing North) 0028	Slot Trench: Width - x Length - x Depth -		No. 1	6 ⁶⁰	W	CURB FACE
Utility: W	Material Type: -	Size: -	Top Depth: -	Bottom Depth: 6 ⁰⁰	Comments: DRY HOLE Cleared 6 ⁰⁰ E, W	No. 2	640	NE Water MH
Subsurface Photo #: 0019	Depth Photo (T) #: -	Depth Photo (B) #: 0020	Finish Photo #: 0026	Utility Direction: -		No. 3	67 ⁸⁰	E Street Light



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Date: 9.14.23

REPORT DATA AND PHOTO LOG

No 019475

Vac Truck#: 6

Customer: Balboa ENG

Technicians: Adrian V. Mike R.

Project Name: Gardendak

Location: Encinitas

POTHOLE #	Soil Type:	Asphalt Depth:	Concrete Depth:	Marker:	Physical Tie-Back Information:	Distance (ft)	Direction	FROM EXISTING:
4	Dg Clay	60	-	PK				
Station #	Pre-Exc. Photo # 0021	Area Photo # (Facing North) 0029	Slot Trench: Width - x Length - x Depth -		No. 1	280	W	CURB FACE
Utility:	Material Type: Concrete	Size: -	Top Depth: 880	Bottom Depth: -	No. 2	520	E	Water Valve
Subsurface Photo #: 0023	Depth Photo (T) #: 0025	Depth Photo (B) #: -	Finish Photo #: 0027	Utility Direction: E, W	No. 3	1780	N	Water MH
Comments:	TOP OF CONCRETE THRUST BLOCK							
POTHOLE #	Soil Type:	Asphalt Depth:	Concrete Depth:	Marker:	Physical Tie-Back Information:	Distance (ft)	Direction	FROM EXISTING:
Station #	Pre-Exc. Photo #	Area Photo # (Facing North)	Slot Trench: Width - x Length - x Depth -		No. 1			CURB FACE
Utility:	Material Type:	Size:	Top Depth:	Bottom Depth:	No. 2			
Subsurface Photo #:	Depth Photo (T) #:	Depth Photo (B) #:	Finish Photo #:	Utility Direction:	No. 3			
Comments:								
POTHOLE #	Soil Type:	Asphalt Depth:	Concrete Depth:	Marker:	Physical Tie-Back Information:	Distance (ft)	Direction	FROM EXISTING:
Station #	Pre-Exc. Photo #	Area Photo # (Facing North)	Slot Trench: Width - x Length - x Depth -		No. 1			CURB FACE
Utility:	Material Type:	Size:	Top Depth:	Bottom Depth:	No. 2			
Subsurface Photo #:	Depth Photo (T) #:	Depth Photo (B) #:	Finish Photo #:	Utility Direction:	No. 3			
Comments:								
POTHOLE #	Soil Type:	Asphalt Depth:	Concrete Depth:	Marker:	Physical Tie-Back Information:	Distance (ft)	Direction	FROM EXISTING:
Station #	Pre-Exc. Photo #	Area Photo # (Facing North)	Slot Trench: Width - x Length - x Depth -		No. 1			CURB FACE
Utility:	Material Type:	Size:	Top Depth:	Bottom Depth:	No. 2			
Subsurface Photo #:	Depth Photo (T) #:	Depth Photo (B) #:	Finish Photo #:	Utility Direction:	No. 3			
Comments:								



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Date: Sept 19 2023 REPORT DATA AND PHOTO LOG

No 019521

Vac Truck#: 3

Customer: Balboa EMU.

Technicians: Manuel & Gabe

Project Name: Grardendale

Location: ENCINITAS

POTHOLE #	Soil Type:	Asphalt Depth:	Concrete Depth:	Marker:	Physical Tie-Back Information:	Distance (ft)	Direction	FROM EXISTING:
8	Sand	0 ⁵⁰	-	PK				
Station #	Pre-Exc. Photo # <u>1</u>	Area Photo # (Facing North) <u>26</u>	Slot Trench: Width <u>1</u> x Length <u>1</u> x Depth <u>4</u>		No. 1	<u>4⁴⁰</u>	<u>W</u>	<u>CURB FACE</u>
Utility:	Material Type: <u>Poly</u>	Size: <u>3"</u>	Top Depth: <u>3⁰⁴</u>	Bottom Depth: <u>3³⁸</u>	No. 2	<u>35⁰⁰</u>	<u>E</u>	<u>CF</u>
Subsurface Photo#: <u>2</u>	Depth Photo (T) #: <u>5</u>	Depth Photo (B) #: <u>7</u>	Finish Photo#: <u>8</u>	Utility Direction: <u>N/S</u>	No. 3	<u>20³⁰</u>	<u>S</u>	<u>W MH</u>
7	Sand	0 ⁵⁰	-	PK				
Station #	Pre-Exc. Photo # <u>9</u>	Area Photo # (Facing North) <u>24</u>	Slot Trench: Width <u>1</u> x Length <u>1</u> x Depth <u>9</u>		No. 1	<u>11⁰⁰</u>	<u>W</u>	<u>CURB FACE</u>
Utility: <u>W</u>	Material Type: <u>-</u>	Size: <u>-</u>	Top Depth: <u>8⁹⁰</u>	Bottom Depth: <u>-</u>	No. 2	<u>29⁰⁰</u>	<u>E</u>	<u>CF</u>
Subsurface Photo#: <u>10</u>	Depth Photo (T) #: <u>11</u>	Depth Photo (B) #: <u>-</u>	Finish Photo#: <u>12</u>	Utility Direction: <u>N/S</u>	No. 3	<u>30⁰⁰</u>	<u>S</u>	<u>W MH</u>
Comments: <u>TOP DEPTH per probe Due to ground water around pipe. unable to expose for photo.</u>								
6	Sand	0 ⁵⁰	-	PK				
Station #	Pre-Exc. Photo # <u>14</u>	Area Photo # (Facing North) <u>28</u>	Slot Trench: Width <u>1</u> x Length <u>1</u> x Depth <u>8</u>		No. 1	<u>30⁰⁰</u>	<u>E</u>	<u>CURB FACE</u>
Utility: <u>W</u>	Material Type: <u>-</u>	Size: <u>-</u>	Top Depth: <u>7⁶⁰</u>	Bottom Depth: <u>-</u>	No. 2	<u>19²⁰</u>	<u>W</u>	<u>E BOX</u>
Subsurface Photo#: <u>15</u>	Depth Photo (T) #: <u>17</u>	Depth Photo (B) #: <u>-</u>	Finish Photo#: <u>18</u>	Utility Direction: <u>N/S</u>	No. 3	<u>11⁴⁰</u>	<u>N</u>	<u>W MH</u>
Comments: <u>TOP DEPTH per probe Due to ground water around pipe. unable to expose for photo</u>								
5	clay	0 ⁵⁰	-	PK				
Station #	Pre-Exc. Photo # <u>19</u>	Area Photo # (Facing North) <u>27</u>	Slot Trench: Width <u>1</u> x Length <u>1</u> x Depth <u>6</u>		No. 1	<u>21⁰⁰</u>	<u>E</u>	<u>CURB FACE</u>
Utility: <u>W</u>	Material Type: <u>STL</u>	Size: <u>6"</u>	Top Depth: <u>5¹²</u>	Bottom Depth: <u>6⁰⁰</u>	No. 2	<u>18⁰⁰</u>	<u>W</u>	<u>CF</u>
Subsurface Photo#: <u>20</u>	Depth Photo (T) #: <u>21</u>	Depth Photo (B) #: <u>22</u>	Finish Photo#: <u>23</u>	Utility Direction: <u>W/E</u>	No. 3	<u>71⁰⁰</u>	<u>S</u>	<u>S MH</u>
Comments: <u>10" outside diameter, 6" mark out</u>								



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PICTURE THUMBNAILS



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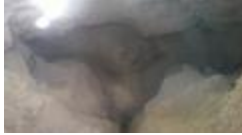
Thumbnail Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 01



Pre-Excavation Photo



Subsurface Photo



Bottom Depth Photo



Finish Photo



Area Photo

Pothole: 02



Pre-Excavation Photo



Subsurface Photo



Bottom Depth Photo



Finish Photo



Area Photo

Pothole: 03



Pre-Excavation Photo



Subsurface Photo



Top Depth Photo



Finish Photo



Subsurface Photo



Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo

The data on this report is intended for informational purposes only. In no way should any of the information presented here be a substitute for professional engineering and design.



Underground Solutions, Inc.
 120 N. Andreasen Dr. Escondido, CA 92029
 (760) 294-9449 • Fax (760) 294-9490 • www.usipothole.com

Thumbnail Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 04



Pre-Excavation Photo



Subsurface Photo



Top Depth Photo



Finish Photo



Area Photo

Pothole: 05



Pre-Excavation Photo



Subsurface Photo



Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo

Pothole: 06



Pre-Excavation Photo



Subsurface Photo



Top Depth Photo



Finish Photo



Area Photo

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Thumbnail Report

Customer	Balboa Engineering, Inc.
Project	Gardendale and Village Park West Pressure Reducing Station
Location	Encinitas, CA
Date	October 03, 2023

Pothole: 07



Pre-Excavation Photo



Subsurface Photo



Top Depth Photo



Finish Photo



Area Photo

Pothole: 08



Pre-Excavation Photo



Subsurface Photo



Top Depth Photo



Bottom Depth Photo



Finish Photo



Area Photo

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LEGENDS



* UTILITY TYPE

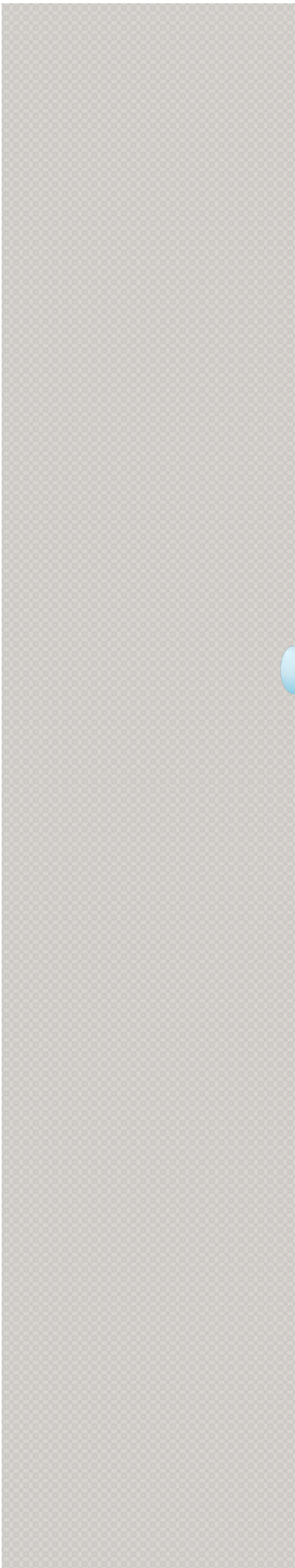
* MATERIAL TYPE

Utility Types

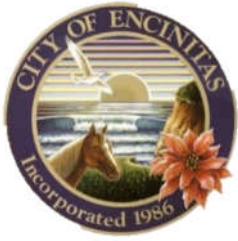
AV	Air Vac
B/O	Blow Off
BL	Brine Line
C/O	Clean Out
CATV	Cable Television
CATV/MH	Cable Television Manhole
CHW	Chilled Water
COMM	Communication
DBW	Direct Bury Wire
DRY HOLE	No Utility
E	Electrical
E/MH	Electrical Manhole
F	Fuel
F/O	Fiber Optic
F/O/MH	Fiber Optic Manhole
FH	Fire Hydrant
SFM	Sewer Force Main
FO	Fuel Oil
G	Gas
HH	Hand Hole
ICV	Irrigation Control Valve
IRR	Irrigation
MH	Manhole
O	Oil
PETRO	Petroleum
RD	Roof Drain
RW	Reclaimed Water
S/MH	Sewer Manhole
SD	Storm Drain
SD/MH	Storm Drain Manhole
STLT	Street Light
SWR	Sewer
T	Telephone
T/MH	Telephone Manhole
T/S	Traffic Signal
UNK	Unknown
VV	Valve Vault
W	Water
WM	Water Meeter
WS	Water Service
WV	Water Valve

Material Types

ABS	Acrylonitrile-Butadiene-Styrene
ACP	Asbestos Cement Pipe
CAP	Corrugated Aluminum Pipe
CIP	Cast Iron Pipe
CIPP	Cast in Place Pipe
CLMP	Concrete Lined Metal Pipe
CMP	Concrete Metal Pipe
COPP	Copper
CPVC	Corrugated PVC
CSP	Corrugated Steel Pipe
DB	Direct Bury
DIP	Ductile Iron Pipe
ENC	Encasement
GIP	Galvanized Iron Pipe
MLC	Mortar Lined Concrete
MTD	Multiple Tile Duct
PE	Poly
PVC	Polyvinyl Chloride
RCP	Reinforced Concrete Pipe
STL	Steel
STLCS	Steel Casing
VALVE	Valve
VCP	Vitrified Clay Pipe
WIRE	Wire
WSTL	Wrapped Steel Pipe



APPENDIX C: CITY OF
ENCINITAS TRENCH CUT
MORATORIUM WAIVER
FORM.



TRENCH CUT MORATORIUM WAIVER REQUEST

CITY OF ENCINITAS

DEVELOPMENT SERVICES DEPARTMENT
505 SOUTH VULCAN AVENUE
ENCINITAS, CA 92024-3633

This form shall be used to request a moratorium waiver in accordance with City of Encinitas Resolution 2019-95 – A Resolution of the City Council of the City of Encinitas Adopting A Trench Moratorium Policy dated December 18, 2019. Trenching is not permitted on a street under moratorium without a valid moratorium waiver granted by the City Engineer.

1. Property Owner/Permit Holder Name: _____

2. E-mail: _____

3. Phone Number: _____

4. Site Address: _____

5. Permit/Application Number: _____

6. Scope of Work:

7. Impacted Street(s):

_____ between: _____ and: _____ Overlay Slurry

_____ between: _____ and: _____ Overlay Slurry

_____ between: _____ and: _____ Overlay Slurry

_____ between: _____ and: _____ Overlay Slurry

_____ between: _____ and: _____ Overlay Slurry

8. Based on the scope of work, the project may qualify for a waiver due to one or more of the following conditions: (check all that apply)

- a) A bona fide emergency exists that endangers the health and safety or property of the citizenry and requires an excavation in order to remediate the emergency.
- b) New service to a specific location cannot be provided either through existing conduit, where trenchless technology is impractical due to soil conditions, proximity of facilities or economically impractical, and the public utility demonstrates to the City Engineer's satisfaction that the service cannot be provided from another location.
- c) The installation or relocation of facilities by a non-government owned public utility is both required by the City, County, State or Federal Government and not required as a result of an underground utility district.
- d) Only a non-linear excavation or exploratory excavation will be made.
- e) Where geological conditions prohibit boring.
- f) Where there is a lack of working space for bore pits at each end of the street crossing bore.
- g) An open trench is required to expose existing distribution facilities in street to terminate or establish service lines, or to provide emergency repair of existing underground facilities.
- h) Existing facilities in the street conflict with the proposed bore.
- i) Joint trench use is required and if within 200 feet of an open sewer or water trench, consideration will be given to an open trench.
- j) Unusual circumstances are present and the City Engineer finds that the public interest is best served by allowing such a cut.
- k) Other (please explain).

9. Resurfacing Requirements: Check circumstance(s) that apply

If this Moratorium Waiver is granted, the requester agrees to repair and resurface the street in accordance with City of Encinitas Resolution 2019-95 and follow required City of Encinitas Standard Drawings and specifications

- a) Lateral trenches (perpendicular to the curb) - Extend T-cut grind and overlay limits to 10 feet beyond each side of the trench and over the entire lane that is impacted (regardless of street classification).
- b) Longitudinal trenches (parallel to the curb - If the asphalt depth is four inches or deeper, grind two inches minimum and place two inches minimum overlay over the entire lane or lanes (curb to curb or curb to median curb) that are impacted (regardless of street classification). If the existing asphalt depth is less than four inches, grind the full depth of asphalt and replace asphalt in-kind (minimum two inches) over the entire lane or lanes (curb to curb or curb to median curb) that are impacted (regardless of street classification).

- c)** If the existing AC depth is greater than 4-inches, grind 2 inches minimum and place 2 inches minimum overlay over the entire lane that is impacted (regardless of street classification) curb to curb.
- d)** If the existing AC depth is less than 4-inches, the entire lane will need to be resurfaced to meet the City's minimum structural section of 4-inches of AC over 6-inches of Class II Base.

10. Property Owner/Permit Holder Signature

- By checking this box, I hereby certify that this project will conform to requirements set forth in City of Encinitas Resolution 2019-95 if a Moratorium Waiver is granted and that I have reviewed the information contained in this form and verified that it is both complete and correct.

Acknowledged By (Type Name)

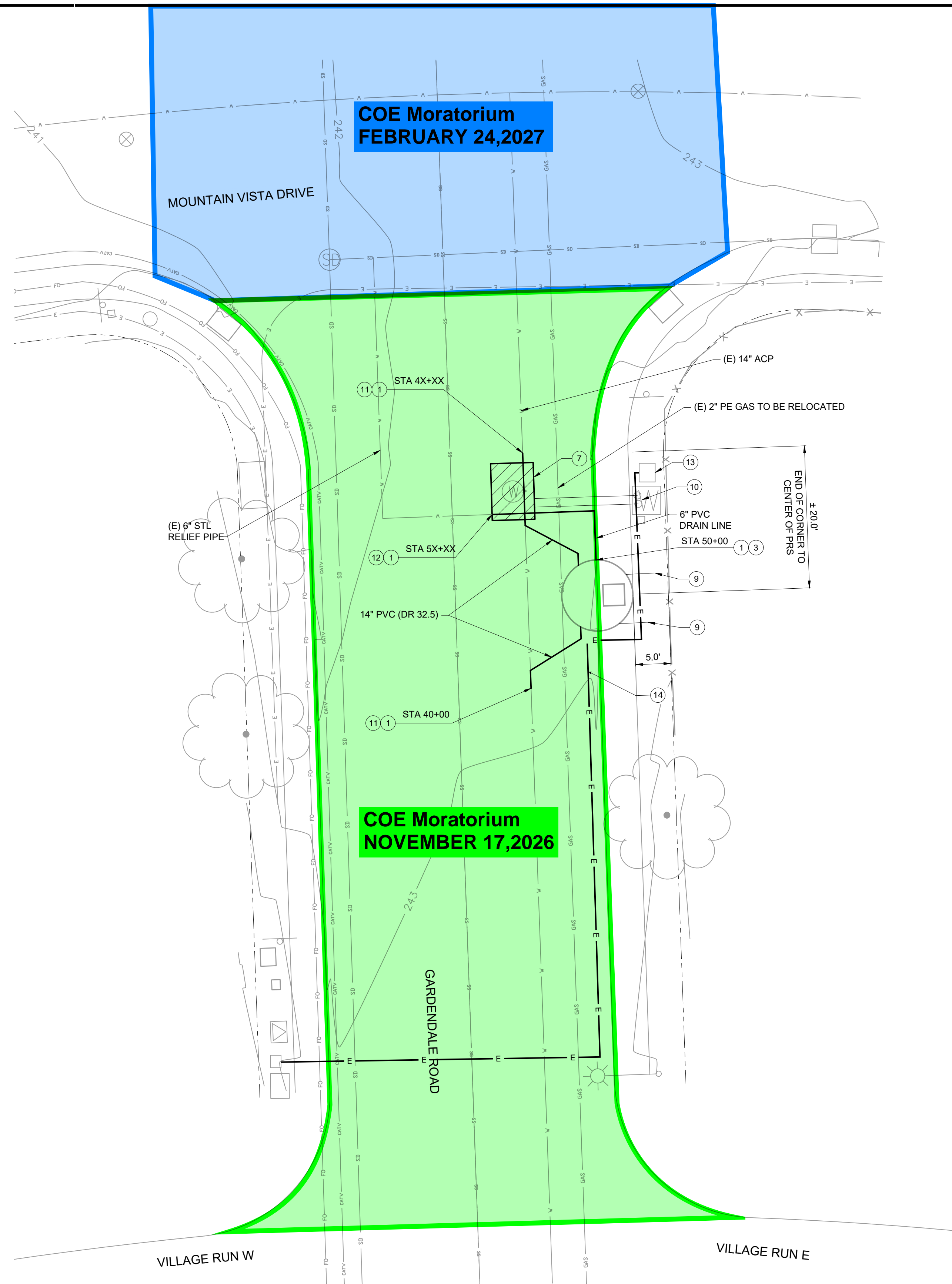
Date

For City Use Only

- Approved Denied

City Engineer

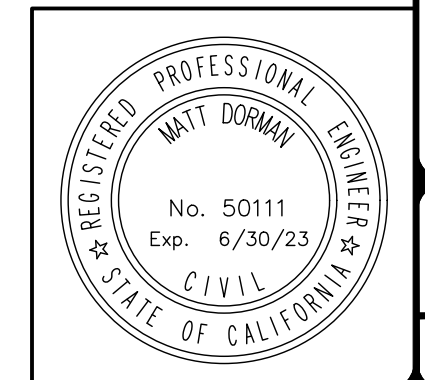
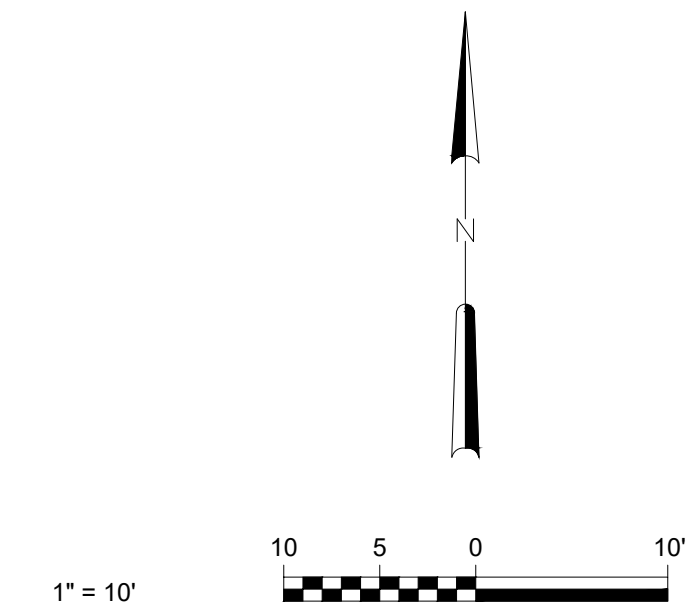
Date



GARDENDALE ROAD PRS
SCALE: 1" = 10'

CONSTRUCTION NOTES

- 1 JOINT RESTRAINT ASSEMBLY PER OMWD APPROVED MATERIALS LIST. FIELD VERIFY ALL CONNECTION POINT DEPTHS, SLOPES, AND O.D. PRIOR TO ORDERING MATERIALS.
- 3 CONNECT TO 6" PRS RELIEF OUTLET
- 7 DEMOLISH EXISTING PRS BY REMOVING AND DISPOSING OF EXISTING UPPER THREE FEET OF VAULT. BREAK OR DRILL VAULT BOTTOM FOR DRAINAGE. VILL VAULT WITH SAND OR 1-SACK SAND/CEMENT SLURRY AND COMPACT PER SPECIFICATIONS.
- 8 EFI PRS. SEE DWG NO P-519802-F2-001
- 9 4" VENT PIPE. SEE SHEET X, DETAIL X
- 10 DEMOLISH EXISTING VENT PIPING AS NEEDED AND TO TWO FEET BELOW FINISH GRADE. REPLACE SECTION OF CURB AND GUTTER REMOVED DURING DEMOLITION TO MATCH EXISTING
- 11 CONNECT TO EXISTING 14" ACP. SEE SHEET X, DETAIL X
- 12 CONNECT TO EXISTING 6" STEEL RELIEF PIPE. SEE SHEET C-X, DETAIL XX
- 13 PROTECT IN PLACE EXISTING SCADA PANEL AND ANTENNA POLE.
- 14 2 ELECTRIC CONDUITS



DESIGN		DRAWN		CHECK		MARK	DATE	BY	REVISIONS
Municipal Water District 1966 Olivenhain Road Encinitas, CA 92024 (760)753-6466									
GARDENDALE AND VILLAGE PARK WEST PRS REPLACEMENTS					GARDENDALE ROAD 14" WATER LINE IMPROVEMENTS				
SHEET 5 OF XX					DRAWING C-2				

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ORIGINAL SCALE IN INCHES 1" = 10'